



# Less Saves The Planet

Let's learn to eat well and save our environment now.



### J calligraphy

hides the silhouette of a man, curious  
about the depths of the deep blue.

The central image also  
reveals a bird set free between  
land and sea.

The symbolism of the circle  
reflects the protection of  
the planet.

# LESS SAVES THE PLANET

*Fadi Joseph Abou*



## Table of contents

---

Prologue - An oriental tale .....	7
Chapter 1 - Everything is still possible.....	15
Chapter 2 - What about meat and dairy products? .....	23
Chapter 3 - Protecting seas and oceans .....	91
Chapter 4 - Saving water.....	147
Chapter 5 - Preserving the soil and protecting insects.....	191
Chapter 6 - Combating waste.....	241
Chapter 7 - The low and slow concept.....	273
Chapter 8 - The "Less Saves the Planet" label.....	289
Epilogue - What they say .....	311



*"It's a sad thing to think that nature speaks and mankind doesn't listen."*

Victor Hugo

## Prologue

---

### AN ORIENTAL TALE

A story or legend handed down from generation to generation and appreciated the world over always contains a truth of great importance for mankind. Such is the case with the story of Joseph of Egypt, which delivers an admirable lesson. For centuries and centuries, this legend has helped and comforted millions of human beings, even if they didn't have all the keys to understand its meaning.

When I was very young, this story of the life of Joseph, son of Jacob and viceroy of Egypt, had a profound effect on me. It has continued to resonate with me throughout my life. Today, more than 3,600 years after its creation, it takes on its full meaning.

This is a true oriental tale. One night, Pharaoh had a dream. In the morning, his mind racing, he summoned all the magicians and wise men of Egypt. He told them about his dream. But

no one could explain it to him. A high dignitary then remembered that, when he was in prison, a slave had told him the secrets of one of his dreams, and that his prediction had come true. So Joseph appeared before Pharaoh, who told him about the dream that was tormenting him:

"Seven cows beautiful to look at and fat of flesh went up out of the river, and grazed in the meadow. Seven other cows, ugly to look at and thin of flesh, came up behind them out of the river, and stood beside them on the river bank. The ugly and thin cows ate the seven beautiful and fat cows. Then I had a second dream in which seven fat, beautiful ears of corn came up on one stalk. And after them grew seven thin ears scorched by the east wind. The thin ears swallowed up the seven fat and full ears.<sup>1</sup> "

Joseph interpreted Pharaoh's dream as a prophecy of seven years of plenty followed by seven years of famine and famine brought on by drought, and announced that steps had to be taken now to avert the catastrophe. Pharaoh was convinced by his words and appointed him viceroy of Egypt to implement his proposed policy. When the climatic catastrophe struck, Joseph's precautions saved Egyptian civilization.

Today, we are faced with one of the most serious problems of our century, a problem that is getting worse: the destruction of our planet. For the past few

---

8 1 - The Bible, Genesis 41; the Koran, chapter 12.



decades, we are destroying the resources of our beautiful planet, which our ancestors cultivated and respected for millennia. Our ignorance of how nature works and what it needs, whether intentional or not, is having terrible consequences that we are finding increasingly difficult to ignore. Melting ice causes flooding, rising sea levels and drought, and its repercussions are dramatic: food shortages and famine, greenhouse gas emissions, deforestation and the accumulation of waste that pollutes more than we can imagine... and we all know it. It's a sad reality, highlighted once again by the slowdown in economic activity during the Covid-19 period; a black period for humanity, but a green one for our flora and fauna, who were able to take advantage of the lull to quickly regain their rights. There is no longer any room for climate scepticism: man's responsibility for climate change is now obvious. The year 2020 was one of the hottest in history, according to the report published in August 2021 by the American Meteorological Society<sup>2</sup>. According to Petteri Taalas, Secretary General of the World Meteorological Organization (WMO), "The WMO has repeatedly emphasized that the industrial and economic slowdown caused by Covid 19 is no substitute for sustained and coordinated climate action." Every decade since 1980 has been warmer than previous ones, and 2019 was also the warmest year in history according to Arctic weather records. This is why Petteri Taalas predicts that "Many

---

2- "State of the Climate in 2020"; Bulletin of the American Meteorological Society, 2021.

extreme weather events in 2020 and beyond" due to global warming<sup>3</sup>. Furthermore, on July 28, 2022, humanity will have used up all the resources that the Earth can regenerate in one year. Beyond this "day of overshoot", the date of which is calculated each year by the American NGO Global Footprint Network, humanity is irreversibly drawing on the Earth's natural reserves. This moment is arriving earlier and earlier: it took place on August 2 in 2017 and on November 1 in 1978<sup>4</sup>. The question today is whether we will be able to control the upheavals caused by climate change. In many countries around the world, people are already organizing and mobilizing to find solutions. Informing people gives them power. And public involvement is increasingly influencing the policies of many governments. It's vital that we address this issue of resource use before they disappear.

One of the most important levers we have at our disposal to mitigate future climate problems is to rethink the way we live and consume. The main solution is to change our diet and habits.

But Joseph's story is not just that of a good manager. Originally from Canaan, a region on the shores of the Mediterranean, he did not arrive in Egypt by chance.

---

10 <sup>3</sup>- ONU Infos website

(<https://news.un.org/fr/story/2020/03/1063661>) <sup>4</sup> - Infos Météo website (<https://overshootday.org/>)

his own brothers had sold him. When he was still young, premonitory dreams had warned him that he would rule over them. Innocently, he had confided this revelation to them, provoking their anger, jealousy and perhaps even fear. By trickery, they kidnapped him and sold him to nomads who took him to Egypt, where he was bought by Pharaoh's eunuch, one of the men closest to power. It was only when he saved Egypt with his wise counsel that he became vizier. By this time, famine was also raging in Canaan, so his brothers came to Egypt to buy grain. However, they did not recognize Joseph, and he did not reveal who he was. Instead, he tried to test them by calling them spies and asking them to bring him their youngest brother, Benjamin, to be used as a hostage in case of betrayal. To their surprise, when they arrived at Joseph's palace, he invited them to a sumptuous feast, during which he finally revealed his identity and forgave them. He then ordered them to bring the whole family clan to Egypt. Each member of the family was given a piece of property.

What does this singular outcome teach us? Forgiveness and mercy are better than anger and hatred, even towards people who, by betraying us, have violated the most elementary rules of morality. Joseph's blessings created the conditions for reconciliation and prevented the cycle of revenge from being set in motion. By demonstrating his humanity, he helped humanity grow.

This moral speaks to us even today. Our environmental approach must also take the path of reconciliation. It is through persuasion and gentleness, and by setting an example, that we will succeed in convincing those who, even today, doubt the urgency of climate change and the need to face up to it. Extremist temptations to radicalize the ecological struggle by casting anathema on those who are not yet convinced of the need to save our planet will only lead to a hardening of positions on both sides. We need to work towards global agreement and cooperation, following the example of Joseph who, far from seeking revenge, found a way to reconcile with his brothers and make them better people. We know: thanks to the Paris Agreement, for the first time, nations have agreed to reach a common goal, even if that goal remains elusive today. We've been thinking about this, and we think we can make a contribution to this mission in a world we know very well: that of the hotel and catering industry. All we have to do is set an example and help other professionals make the transition we're hoping and praying for, before it's too late.

What we propose in this book are original solutions that are easy to apply, tangible and capable of inspiring genuine optimism.

**Fadi Joseph Abou**

*"Always go by the shortest way, and the shortest way is the way made by nature."*

Marcus Aurelius



*"When one man dreams, it's just a dream. But if many men dream together, it's the beginning of a new reality."*

Friedensreich Hundertwasser



## 1 - Everything is still possible

---

For several decades now, global warming has been putting nature to the test. We may have a theoretical understanding of its effects, but it's only when extraordinary disasters occur that the alarm bells ring - and are soon forgotten. Yet, beyond terrible events such as Chernobyl or Fukushima, the progressive destruction of our biodiversity is very real: the submergence of the lowest-lying coastal areas, increasingly frequent and violent hurricanes and cyclones, as well as increasingly intolerable air pollution, are all symptoms that are becoming difficult to ignore without bad faith. Such degradation of our environment is forcing us to question principles we have taken for granted about economic development, the exploitation of natural resources and society.

Isn't it possible to change the way we look at these phenomena once and for all? Is it not

is it possible to see in these apparently irrational manifestations an incitement to adopt new behaviours, and even a new vision of the world, and in this complete upheaval of our values an invitation to wipe the slate clean of our destructive logics?

At the start of the <sup>21st</sup> century, our aspirations, whatever our origins, nationality or place of residence, are similar: we all want to see our essential needs met, live in peace and enjoy an unpolluted environment that is beneficial to our overall health. However, in both advanced countries and emerging economies, we are confronted with lifestyles and consumption practices that are increasingly recognized as harmful.

Generally speaking, marketing encourages consumers to buy inexpensive products that are harmful to their health, or to use services without considering their impact on the environment. The practices of the food industry and advertising are profoundly changing our cherished culinary traditions. Many gestures inherited from the past and passed down from generation to generation are disappearing, and with them a whole body of know-how, giving way to standardized cooking, embellished with a few childhood memories.



## **The passive consumer must become a consumer-actor.**

In the face of this race to the bottom, a movement has been developing in many countries over the past few years to promote ethical and responsible consumption: eco-consumerism, which encourages consumers to avoid products or services that are harmful to the environment, by favoring those that contribute to sustainable development and the survival of our planet. In English-speaking countries, this is known as dollar voting. This practice, massive in our societies, is a sign that we can, even as individuals, contribute to change. Making the right consumer choices is the best way to have a significant and effective impact on our world.

As we shall see in Chapter 2, public opinion has mobilized against the scandal of factory farming without waiting for politicians, proving that the men and women who are determined to get involved on a daily basis hold part of the solution in their hands. Increasingly aware of the dangers these products pose to the planet, consciences are awakening. Customers accustomed to buying these products and services are changing their habits, and this silent movement is forcing business leaders and the corporations that sell them to modify their commercial strategies. As people become better informed and more aware of the dangers facing the planet, they acquire a greater sense of responsibility.

a new power: that of shaping the landscape of supply and demand. The awareness we are witnessing will have - and is already having - a strong and decisive impact on our world. All we need to do is continue to inform as many people as possible, in order to encourage goodwill at both individual and collective levels.

This is all the more necessary in view of the fact that our current lifestyles and consumption patterns do not really satisfy us. Admittedly, the world has experienced a period of unprecedented economic development, and "economic growth is necessary for human development", as the 1991 World Development Report of the United Nations Development Programme (UNDP) emphasized. Yet in 1996, the same UNDP report warned that "there is no automatic link between economic growth and human development", specifying that human development (in other words, happiness) is an end, of which economic growth is a means. Because growth can be indispensable to well-being, it has long been equated with social progress. However, beyond a certain level of GDP per capita, growth in income and consumption no longer provides satisfaction or well-being.

Today, we feel the emptiness of this lifestyle and realize that it is the main factor behind the phenomenal increase in our ecological footprint.

of mankind on the planet, with all the catastrophic consequences that entails. Our own behaviors have led us to this fatal outcome, and it is by modifying them and adapting them to the reality that is becoming ours that we will succeed in reversing the infernal process in which we have trapped ourselves. According to a recent study, 80% of consumers say they are ready to favor companies with social or environmental practices. It's important to understand that together we have the capacity to act now, without waiting for the public authorities to step in. If we devote our spending to ethically and sustainably designed products, we force the industry to transform itself and adopt practices and techniques that are positive for both people and animals.

### **A citizens' movement that is shaking up national and European governments**

As we have shown, informing consumers plays a decisive role: it creates a horizontal and transversal mobilization which, starting from the bottom up, pushes the major economic players to modify their practices. This shift in public opinion has even led the European Union to adopt increasingly stringent standards for the minimum protection of animals, and, above all, it has led to the flowering of labels of

quality to better satisfy consumers. As we have said, such a mobilization requires first and foremost a personal awareness and a demand on ourselves: we must strive to act first on what is closest to us, in our daily lives, and then ask ourselves how we can change our way of life so that our conduct, from one step to the next, translates into a greater and greater change, which will end up having a colossal impact on the environment.

The movements that are sweeping through contemporary societies and changing them profoundly all have one thing in common: they take advantage of social networks to spread horizontally through society by capillary action, before coming to light. In his book *La contre-société*<sup>1</sup>, sociologist and professor at Paris-Descartes University Robert Sue has shown that these horizontal movements are based on the singularity of myriads of individuals who; reject vertical hierarchies, always oriented from the top down, want to cooperate on specific projects and mobilize for concrete ends. Digital means facilitate commitment by making any action, whatever it may be, almost immediate.

The tremendous growth of the voluntary sector bears witness to this desire on the part of citizens to commit themselves to causes they consider worthy of their time and money. In many countries, not only in Europe but throughout the world, millions of volunteers are active in the following areas

---

1 - Florence Millerand, Serge Proulx, Julien Rueff, *Web social : Mutation de la communication*, Presses de l'Université du Québec, 2010  
20 gil Adamy, *Le Web social et la e-réputation : Le nouveau power of consumer-actors*, gualino Éditions, 2012.

in hundreds of thousands of associations. More than half of them say they are driven by a "desire to act" in the current context. And many of them see this translated into action: around a third say they are now exercising greater responsibility within their association, taking more interest in their mission and devoting more time to it. They also emphasize the power of the collective to play a role in society and influence its evolution. Citizenship", as the The "values of solidarity" are also much more pronounced.

This collective intelligence, these individual wills, we too can federate and use them to change our lifestyles and the way we eat, changes that are necessary to save our planet.

In this context, hotel and restaurant owners will have a crucial role to play, a role of educator and pathfinder: setting an example through their behavior and proposing new practices and models that pave the way for this revolution we're all hoping and praying for. Everything is still possible. We just need to wake up.

*"Being wrong is falsely associated with failure. In reality, realizing one's mistake should be celebrated, as it allows for a new level of understanding that fosters awareness."*

Zeitgeist



*"The world contains plenty for everyone's needs, but not enough for everyone's greed."*

Gandhi



## 2 - What about meat and dairy products?

---

### **The history of mankind**

If there's one question that provokes much debate on the subject of food, it's this: should we continue to eat meat, and if so, how much? In other words, is meat essential to our survival and evolution?

Looking back, it seems that since prehistoric times, meat has more or less always been part of our meals. The diet of *Homo habilis* 2.4 million years ago was omnivorous, and the nutritional benefits of meat - protein, iron, vitamins B3, B6 and B12 - would have favored brain development in *Homo erectus*. Meat consumption among humans also increased during the Early Paleolithic period, and the consumption of animal-based foods rose steadily among peoples living in the coldest regions of the world<sup>1</sup>. Meat therefore seems

---

1 - Brigitte and Gilles Delluc, L'alimentation au Paléolithique, CNRS UMR 7194, Department of 23 préhistoire du Muséum national d'histoire naturelle, Paris.

have played an important role, if not in the survival of our species, at least in its adaptation to climate and evolution. The first hunter-gatherer societies, then the herding societies at the time of sedentarization, are civilizational models that we find again today, despite centuries of evolution.

Because of all the excesses of our consumer societies, this food heritage is now being called into question as never before. With globalization, the networking of thought patterns has exploded, and the truth about how to behave towards food seems to be both everywhere and nowhere. How can we discern truth from falsehood, right from wrong, and which models to follow and which not to? In this context, it's vital to be able to refer with confidence to the leading figures in the food world, in order to find a happy medium, a personal balance, between all these discourses, as convincing as they are convincing.

More than ever, the hotelier-restaurateur must be the new actor of change. With his authority as a professional chef in the culinary arts, his knowledge of products and how to prepare them, and the social network that naturally develops around all restaurants and hotels, he has the ability to become the apostle of new eating practices. He thus becomes a teacher for those who want to eat well, a legitimate guide. Given the current circumstances



mass production of meat and other animal products, advising people on the best ways to eat must become a priority. It's also the role of every individual to support restaurants in this ambitious objective by becoming, at their level, a representative of the

The aim is to promote the "eat better" concept and disseminate it as widely as possible.

## **World meat consumption today and tomorrow: a meteoric rise or a reasoned stabilization?**

What is the current state of meat consumption worldwide? A look at the statistics shows that it is currently on the rise, and quite significantly so. With an annual increase of 2.3% over the last ten years, meat consumption reached 323 million tonnes in 2017, including all animal products, i.e. twice as much as in 1983, according to the Food and Agriculture Organization of the United Nations (FAO). It is set to rise from around 270 million tonnes in 2010 to 470 million tonnes in 2050, i.e. from 41kg per capita to 52kg per capita per capita (30 to 44kg per capita for developing countries), with demand for pork and poultry increasing by 25% and 10% respectively<sup>2</sup>. On the consumer podium are China, Europe and North America, followed by South America. The Chinese consume 28% of the world total, the Europeans

---

<sup>2</sup> - Les synthèses de FranceAgriMer : " La consommation mondiale de viande : état des lieux, dynamique, défis, perspectives ", édition 2011 ([https://www.franceagrimer.fr/content/download/6869/39482/file/Conso-2011%20\(1\).pdf](https://www.franceagrimer.fr/content/download/6869/39482/file/Conso-2011%20(1).pdf)). 25

20% and North America 14% (including 13% for the USA). The smallest consumers are Africa (5%), Central America (4%) and Oceania (1%).

Yet in its 2019 report "OECD-FAO Agricultural Outlook 2019-2028", the FAO states that "growth in demand for animal protein is expected to slow worldwide over the next ten years". It predicts a form of temperance in meat consumption among populations enriched over several generations, who "tend to adopt healthier diets and progressively diversify their eating habits, preferring varied types of cuisine and foods based on environmentally-friendly products", even if, for their part, the nouveau riche "tend to consume more livestock products, particularly red meat and fatty foods".

The demand for meat is therefore associated with rising incomes and the adoption - as a result of urbanization - of food consumption patterns that give greater prominence to animal proteins, which confirms our ranking of the world's biggest meat consumers. Meat is one of the symbols of the middle classes' accession to a relative form of affluence, particularly evident in countries such as China and sub-Saharan Africa. In addition, according to the FAO, meat

is little traded worldwide (only 8% of what was produced): volumes produced and consumed are fairly comparable on a continental scale. According to projections drawn up by the Organisation for Economic Co-operation and Development (OECD), total consumption of beef, sheep, pork and poultry could continue to rise between now and 2026. And the Organization points out that "given the strong population growth in much of the developing world, total consumption is expected to increase by almost 1.5% per year", even though, "global per capita meat consumption is expected to stabilize at 34.6 kg in retail weight".

We are therefore facing a two-speed evolution which, in the eyes of the FAO, should nonetheless lead to a globally revised downward balance: "Current projections take into account these trends suggesting that average global meat consumption should be around 90 g per day, compared to the current 100 g per day, and that no more than 50 g per day should come from ruminant red meat. If this target were achieved, it would reduce the peak demand for meat<sup>3</sup>. A rather encouraging forecast, but one that assumes a switch from intensive livestock farming to sustainable livestock farming to truly benefit the environment and promote animal welfare.

This approach enables us to assess the Earth's capacity to sustain life, both for humans and for animals.

---

3 - FAO, "Livestock in the world 2011: Livestock's contribution to food security", 2012. 27

and biodiversity. The researchers identified nine planetary limits on which human life depends: climate change, biodiversity erosion, disruption of the biogeochemical cycles of nitrogen and phosphorus, changes in land use, ocean acidification, global water use, stratospheric ozone depletion and increased aerosols in the atmosphere.

Some of these thresholds have already been crossed as a result of human activity: the first four are well over, and the next ones are likely to follow suit if we don't change our behavior.

Because while the data and forecasts on meat consumption are relatively optimistic, we mustn't forget that the meat industry does considerable damage to the three pillars of life on Earth: the environment, animal welfare and public health.

It's up to us to limit these impacts as much as possible today, by adapting our consumption habits.

*"The first rule of ecology is that the elements are all related to each other."*

Barry Commoner

## **Livestock farming around the world and its impact on the air and soil**

Given that global meat consumption and production has never been as high as it is today, the hotelier-restaurateur's first mission concerns meat and dairy products. His choices, like those of every consumer, can influence the degree of pollution emitted at different levels by intensive livestock farming.

According to the latest data published in April 2019 by the FAO, global meat production in 2018 is estimated at 336.4 million tonnes, up 1.2% on 2017, and comes mainly from the United States, the European Union and the Russian Federation. However, this is partially offset by lower production in China and stagnation in Brazil, two of the world's biggest meat producers. In 2020, the FAO's annual growth rate of 2.4% is considerably lower than 2019's 6.4%, largely due to a possible reduction in global meat consumption, in line with forecasts of a general economic slowdown.

International trade in meat is expected to reach 37 million tonnes in 2020, which is still a very high level.

---

4 - This percentage is taken from the FAO report "Livestock Update - The State of Food and Agriculture", 2009, which states: "Livestock is the largest user of the world's land resources, with pasture and forage cropland accounting for nearly 80 percent of the total agricultural area". However, a distinction needs to be made between pasture and forage-growing land. The latter, again according to the report, corresponds to "a third of the total cultivated area". As for the total area used for pasture, it "is equivalent to 26% of the world's ice-free land, much of which is too dry or too cold for cultivation, and very sparsely populated. Pasture use and management practices vary widely, as does livestock productivity per hectare". The figure of 80% of agricultural land must therefore be qualified.

consequent. Every year, 65 billion animals are killed (that's almost 2,000 animals... per second) to end up on our plates.

This massive production has serious consequences for our environment. The report "Less but better" published in March 2018 by the non-governmental organization greenpeace points out that livestock farming occupies up to 80% of the surface area of agricultural land<sup>4</sup>, and that it is, among other things, with the expansion of soya cultivation for cattle, responsible for 80% of the deforestation of the Amazon rainforest. We know that the latter is the main

It is the Earth's "lung", and its biodiversity is rich in over 130,000 species, including the greatest variety of plant species in the world<sup>5</sup>. Recent research has shown that its disappearance would lead to massive desertification in South America, which would be a veritable ecological catastrophe<sup>6</sup>. As a result, our planet and its various ecosystems are undergoing a veritable transformation, and our way of eating is at the heart of these changes.

Agriculture, and livestock farming in particular, is one of the main factors responsible for accelerating global warming, and for the loss of biodiversity worldwide. greenpeace stresses that its impact on forests, water resources and our climate, "animal feed production contributes to food insecurity when land is used for animal feed".

---

5 - Peter Bunyard, "The Real Importance of the Amazon Rain Forest", *The Ecologist Magazine*, 2010.

6 - M. E. Pitesky, K. R. Stackhouse, F. M. Mitloehner, "Clearing the Air: Livestock's Contribution to Climate Change", Davis, University of California

to feed animals instead of directly feeding the population. The conversion of plant matter into animal feed is extremely inefficient. Only 3% of the plant calories absorbed by cows are converted into animal calories in the case of beef, for example". The NGO concludes its study by asserting that we should halve our meat consumption if we are to meet the climate objectives of the Paris Agreement. But while meat and dairy production together emit half of all food-related greenhouse gases, together they account for just 20% of calories consumed worldwide.

What's more, in 2006, an extensive FAO report sent shockwaves: it demonstrated that raising animals for meat production emits more greenhouse gases (GHGs) than the entire transport industry. According to the report, the livestock and dairy production industries produce 18% of all greenhouse gases: 9% of all CO<sub>2</sub>, 37% of methane (which has a warming power at least 25 times greater than CO<sub>2</sub>) and 65% of nitrous oxide. Like intensive livestock farming, the dairy industry has a highly negative impact on the environment. A dairy cow produces between 140 and 160 m<sup>3</sup> of digestive methane per year, for a milk production of 3,400 to 6,500L. This FAO estimate was subsequently confirmed by other organizations. A study by the Bureau d'analyse sociétale pour une information citoyenne (BASIC) estimates the cost of the carbon footprint

of dairy cows at several billion euros. The risk is not only environmental, but also health-related. Breeders are the first to be affected. "Chronic bronchitis, asthma, pulmonary fibrosis and upper respiratory tract diseases account for half of all occupational respiratory diseases in livestock farmers," explain BASIC researchers. The latest FAO report on this subject, published in 2013, estimates that livestock farming worldwide is responsible for 14.5% of greenhouse gas emissions linked to human activities on the planet, including 9.7% for cattle farming alone: around 7 billion tonnes of CO<sub>2</sub>, i.e. more than the United States and France combined.

Like water consumption, the amount of CO<sub>2</sub> equivalent emitted by livestock farming gives rise to much debate: CO<sub>2</sub> is the main greenhouse gas, but all the greenhouse gases emitted by fertilizers in the fields for our livestock are combined in a single indicator called "CO<sub>2</sub> equivalent" (eq-CO<sub>2</sub>). It should also be pointed out that the quantity of gas emitted by a livestock farm in Western Europe is incomparable to that emitted by a livestock farm in South Asia, Latin America or sub-Saharan Africa. Here are the very different figures - taken up by many pro-vegetarian associations - given by the FAO: an average of less than 20 kg of eq-CO<sub>2</sub> in Western Europe, whereas worldwide, all livestock combined, 1 kg of beef emits 46.2 kg of eq-CO<sub>2</sub>. This does not call into question the figures communicated by Inra. The carbon footprint of beef raised in France is



between 10 and 18 kg eq-CO<sub>2</sub> per kg, but the worldwide average is 46.2 kg eq-CO<sub>2</sub> per kg.

The way cattle are fed also plays a significant role. The proportion of corn in a heifer's ration is increasing at the expense of grass. Yet corn requires a lot of water, chemical fertilizers and pesticides. Irrigation systems that allow watering in midsummer are partly subsidized by water agencies, and therefore by residents connected to the drinking water network. Finally, the growing importation of soya from Brazil, a crop that contributes to deforestation, adds to the bill. Even without consuming meat imported from this country, France supports Amazon deforestation by sourcing Brazilian soya to feed its livestock, Brazil being the world's leading exporter for both human (mainly Asian) and animal consumption. The quest for greater productivity - a dairy cow now produces an average of 8,000 litres of milk a year, compared with 2,000 in 1950 - is also driving farmers to feed their herds protein-doped rations, mainly derived from maize or soya. These "energy concentrates", which account for up to 25% of dairy cow feed, maintain this vicious circle.

Despite the importance of the problem, these figures can be put into perspective. Current assessments of livestock production do not take account of carbon storage in grassland soils. Yet, apart from agriculture and forestry, livestock farming is the only economic activity that

captures carbon at the same time as it emits it. The 13 million hectares and mountain rangelands in the world used by herbivores store as much carbon in their soils as forest soils, thereby helping to reduce greenhouse gases in the <sup>atmosphere</sup><sup>7</sup>. The majority of the ecological damage described in the FAO report therefore stems primarily from the development of intensive, industrial livestock farming. In other words, what we eat puts our world at risk.

A more artisanal approach to livestock management could therefore help mitigate the harmful effects. In France, for example, emissions from the agricultural sector have fallen by 11% since 1990, thanks to a reduction in the number of cattle (-12% since 1990), which has led to a drop in methane (CH<sub>4</sub>) emissions, and to savings in mineral fertilizers resulting from better use of farmyard manure. This is the trend we need to aim for if we are to preserve our natural resources.

## **Water and livestock farming**

Today, the livestock industry is the main source of water pollution, via slurry, manure and veterinary drug residues, in both developed and emerging countries. As a result, freshwater consumption is currently under severe pressure.

worldwide by cattle, pig and poultry farming systems, even though it is one of our most precious resources - if not our most precious.

Meat production has an impact on water consumption at various levels. We have seen that red meat production is a major drain on the freshwater resources we currently have. According to a study carried out by UNESCO in <sup>2010</sup><sup>8</sup>, it takes 15,000 L of water to produce 1 kg of beef, compared with 4,600 L for 1 kg of cereals and 1,600 L for 1 kg of pulses: the imbalance between the quantity of resources invested in producing meat and the result obtained is therefore significant.

The use of water stocks not only leads to their waste, but also to the discharge of various toxic substances into nature, with all the dramatic consequences that this entails: animal waste, antibiotics, hormones, chemicals from tanneries, fertilizers and pesticides used for forage crops, and sediment from eroded pastures<sup>9</sup>. In Europe, intensive animal farming, including fish farming, is responsible for over 50% of water pollution. According to the Bureau d'Analyse Sociétale pour une Information Citoyenne (BASIC), the 3.8 million cows that make up France's dairy herds are responsible for 10% of water pollution.

---

8 - M. M. Mekonnen, A. Y. Hoekstra, "The green, blue and grey water footprint of farm animals and animal products", UNESCO Institute for Water Education, December 2010.

9 - Article from Eaux et rivières de Bretagne (Centre régional d'initiation à la rivière), 2017.

10 - Environmental Integrity Project, 2011 - Hazardous Pollution from Factory Farms" and "USEPA, 2011 - Human Health" on the CIWF website.

pollution of rivers and groundwater<sup>10</sup> , which suggests just how high the global pollution rate would be if it could be quantified with certainty and precision.

This problem is probably much less well known than the problem of excessive consumption of drinking water, even though its effects are devastating. The case of Brittany is a perfect illustration of the catastrophic effects of intensive livestock farming on water tables, i.e. the reserves of fresh water in the subsoil. The region is heavily involved in off-farm livestock farming (mainly pigs, which account for 50% of French production), and in 1994 was classified as a "zone vulnerable to nitrates from agricultural sources" in accordance with the European directive of December 12, 1991 concerning the control of water pollution caused by nitrates from agricultural sources<sup>11</sup> . In fact, 94% of nitrates discharged into Brittany's drinking water resources come from agriculture<sup>11</sup>. In 2007, the European Commission referred the matter to the Court of Justice of the European Union to intervene in the pollution of Brittany's waters, underscoring the scale of the problem.

Not only does water pollution from nitrates, phosphorus, antibiotics and other products added to animal waste degrade water quality, it also encourages the proliferation of green algae. These monopolize space and resources in the water, to the detriment of other plant and animal species, and even leave "dead zones" in the water.

acidifying the water in which they proliferate<sup>11</sup>. This is the case on the Brittany coast, where we regularly witness green algae tides that disrupt marine flora and fauna, and require costly and extensive water treatment. The environment, the cost of living and the quality of life in Brittany are paying a high price for this intensive livestock farming. And yet, even if its case is significant on a European scale, this region is far from being the only one affected today.

Water pollution is compounded by air pollution when liquid manure is spread, and the strong smell makes life difficult in the vicinity of livestock farms. Although it may seem more trivial, this factor nonetheless has a significant impact on daily life.

The problem is therefore twofold, since we are witnessing both the monopolization and repeated disruption of aquatic zones. The consequences can quickly be dramatic, as the example of Brittany shows.

The vicious circle caused by unscrupulous industrial livestock farming is causing cascading damage to biodiversity and human life worldwide, as the United Nations pointed out in 2010: "Livestock farming is among the most destructive sectors on the planet, exacerbating the scarcity of water resources and contributing, among other things, to the contamination of water with animal waste, antibiotics and hormones, chemicals from tanneries, and chemical fertilizers and pesticides sprayed on food crops."

At a time when 6.4 billion people do not have access to reliable drinking water, and when 70% of water withdrawals are made by the agricultural <sup>sector</sup><sup>12</sup>, it is urgent for the livestock sector to make reasoned and respectful use of water resources. It is also urgent that consumers take the measure of this impact and factor these major environmental issues into their lifestyle choices.

### **The importance of animal welfare for meat quality**

Another major issue concerning intensive livestock farming on which we need to take a stand is ethical, health-related and, ultimately, food-related: the importance of animal welfare for meat quality. This issue lies at the crossroads between animal welfare and the impact of unbridled meat consumption on our health, as well as on the environment. Each issue is a facet of the same core of life, so fragile yet so important to preserve for tomorrow's world. "The greatness of a nation and its moral progress can be judged by the way it treats animals", pleaded Gandhi. Yet it is clear that the industrialization and massification of meat production does not speak in favor of our civilization, which is regrettable.

We explained in the previous section that the deplorable living conditions of animals in intensive farming

were morally reprehensible, as they could jeopardize their well-being. But recent discoveries about the mental capacities of animals are opening up very interesting perspectives on the impact of animal health on product quality, and therefore on our own well-being as consumers. Let's take a concrete example: ingesting hormone-fed poultry meat, with bones made soft and brittle by a lifetime spent in a cage that's too small, is like ingesting a condensation of stress and suffering, and consuming a product of low nutritional quality. At a time when 83% of broiler chickens are raised without access to the outdoors, 58% of hens and 99% of rabbits in cages, 95% of pigs on slatted floors in buildings with a high mortality rate (20% of pigs die before the day of slaughter)<sup>13</sup>, various scientific investigations, which we will develop further, nevertheless prove that a mistreated animal will not produce good meat, nor good eggs or milk for hens and cows.

It is possible to determine the quality of animal welfare by the amount of PH present in the meat. According to a 2012 study on the subject by <sup>INRA</sup><sup>14</sup>, a stressed animal, particularly at the moment of death, will experience a drop in PH and its muscular metabolism will be profoundly altered: "Stress reactions during the pre-slaughter period accelerate peri-mortem muscular metabolism and may modify meat qualities in this way." Visit

---

13 - Agreste, 2010. 2010 Agricultural Census

14 \_ Institut national de recherche agronomique, "Stress des animaux et qualités de leurs viandes. Rôles du patrimoine génétique et de l'expérience antérieure" (<https://www6.inrae.fr/animalproductions/content/download/3881/40086/version/1/file/ProdA-nim200215205.pdf>).

Indeed, if the PH drops too quickly, the meat will be pale, flabby and hard to eat. The fear of the animal in question therefore has an influence on the modifications engendered, but the article also shows that "chronic housing stress and the farmer's attitude towards his animals influence the way in which the animal reacts to new situations and to handling by man (...) [and] stress reactions during the pre-slaughter period accelerate muscle metabolism peri-mortem and may modify, by this means, the qualities of the meat". A piece of meat from an animal-friendly farm will therefore not have the same appearance as low-quality meat, so if consumers knew a few tricks for recognizing quality meat, this could change collective consumption in the long term.

Other studies confirm the importance of animal welfare in meat production. Such is the case of a study carried out in 2014 by the highly influential Scientific and Technical Review of the Office International des Epizooties (OIE). We now know with certainty that mental suffering and psychological stress (phobia, anxiety, compulsion, depression...) in animals limit their immune capacities and weaken their physical health. It has already been clearly demonstrated that psychological stress in production animals affects their physical health. Taking care of the well-being and even the mental health of animals can therefore not only improve their health, but also



the quality of livestock products.

In 2002, the OIE, the international reference for animal health and zoonoses and now renamed the World Organization for Animal Health (with the same acronym OIE), became the leading body in the field of animal welfare. This intergovernmental organization was tasked with incorporating animal welfare requirements into existing Codes, and even proposing specific recommendations. As a result of this work, an ISO standard (2016) has been <sup>published<sup>15</sup></sup>.

The OIE has thus defined the "Five Freedoms" of animals, five principles that must be applied to ensure the comfort of animals under human control and a peaceful cohabitation between man and animal:

- Absence of hunger, thirst and malnutrition;
- Absence of fear and distress;
- No physical or thermal stress;
- Absence of pain, injury and disease;
- Possibility for the animal to express

behaviors specific to its species.

These principles must govern all stages of animal life, from breeding and transport to slaughter. When these now-accepted standards are not respected, the result is scandals, which are now frequent in the media, proving that this issue has become extremely sensitive. Choosing quality meat from well-treated animals is therefore essential for our personal balance.

---

15 - ISO/TS 34700:2016, Animal welfare management - General requirements and guidance for 41 food industry organizations: <https://www.iso.org/fr/standard/64749.html>

## **The example of foie gras production**

The industrial force-feeding of ducks and geese is an infamous example - probably the most infamous - of animal mistreatment, so it's a good idea to talk about it to get as many people as possible thinking about their eating habits. It shows that applying the necessary principles of animal welfare to meat production is as important as it is achievable, even with a practice as controversial as this one. And if change is possible for foie gras production, why shouldn't it be for all other types of livestock farming?

At first glance, the atrocity of this method would seem to call for a ban on foie gras consumption. Legislation to this effect already exists in the USA, in California and New York. In their defense, the breeders point out that force-feeding is based on the natural tendency of these migratory birds to overeat at the onset of winter in preparation for their long journey: at this time, they naturally gorge themselves on grasses and acorns.

A number of exceptional breeders have chosen to return to this ancestral method, which offers every ethical guarantee and causes no injury to the animals, who gorge themselves without human intervention. These farms are located on the

They are, of course, extensive and open-air. By interbreeding, wild geese and ducks pass on to farmed geese and ducks the genetic faculties that are rapidly lost on factory farms. Farmers then choose naturally fatty products, such as acorns and corn, to feed them: their livers then gradually become fatty. Unlike industrial methods, this practice takes more than ten months, so foie gras can only be eaten once a year. But it does guarantee foie gras of exceptional quality, without any animal suffering.

A 1998 European Commission report, which stated that force-feeding is detrimental to animal welfare, also pointed to the gradual industrialization of the industry: "The traditional technique of force-feeding has been substantially modified over the last thirty years in order to rationalize and industrialize foie gras production and increase its profitability. This has had an impact on the animals subjected to the process, their housing conditions, and the composition and method of feed administration."

### **Prescription drugs and animal health in the context of livestock farming.**

The figures provided by the FAO are overwhelming: as we have seen above, to supply meat, more than

2,000 animals are killed every second, or 60 billion every year. And the Organization predicts that by around 2050, between 110 and 140 billion animals will be killed annually if we continue at the same rate. Such a pace is driving the increasingly massive industrialization of livestock farming. The giant farms being built today, with their superimposed storeys and living space reduced to a minimum for each animal, engender a radical malaise in them - to put it mildly - which in turn has severe consequences.

The Covid-19 epidemic that marked the year 2020 is highly revealing of the worrying problems currently affecting our immune defences. It certainly won't be the last of our century, and we can directly link this type of health catastrophe to similar phenomena in the livestock industry, such as mad cow disease a few years ago. The two systems are closely linked, for better or for worse, and this fragile balance is now threatened by the use of antibiotics on intensive livestock farms. For many of these ethically deplorable structures, the use of preventive and systematic (over)medication for all their animals, directly in their daily feed, has become the norm.

Regulations can be very lax or even non-existent in this area, which is why it is estimated that in China

over 100,000 tonnes of antibiotics are administered to livestock every <sup>year</sup><sup>16</sup>. This habit has been adopted to avoid the slightest disease on farms and/or to rapidly increase the growth of livestock, depending on national legislation. In fact, the extremely high density of animals per square meter in intensive livestock farming systems, such as battery cages, exponentially favors the emergence and spread of animal diseases. Modern livestock farming systems are effectively incubators for viruses such as salmonella, campylobacter, E. coli and other "flu" promoters of all kinds. As an FAO report<sup>17</sup> points out:

"It's not surprising that three-quarters of the new pathogens that have affected humans in the last ten years have come from animals or animal products". So, to maintain a very high production rate without risking an epidemic among crowded animals, the use of antibiotics has become an easy solution for many livestock farms.

What's more, this also means less feed for the animals: pigs given antibiotics reach market weight on 10-15% less feed, for example.

Even if the European Union imposes a certain control on this

---

16 - Analysis no. 82 of September 2015 from the Centre d'études et de prospective of the French Ministry of Agriculture, Food and Forestry.

17 - T. Kuno, M. Hirayama-Kurogi, S. Ito, S. Ohtsuki, "Effect of Intestinal Flora on Protein Expression of Drug-Metabolizing Enzymes and Transporters in the Liver and Kidney of Germ-Free and Antibiotics-Treated Mice", 2016.

In 2006, the European Union banned the use of antibiotics for animal growth, but the phenomenon continues to grow on a global scale. Kazuaki Miyagishima, Director of the Food Safety, Zoonoses and Foodborne Diseases Department at the World Health Organization (WHO), emphasizes this problem, pointing out that "the volume of antibiotics used in animals continues to grow worldwide, driven by the growing demand for animal-derived foods, often from intensive livestock production". As the proportion of antibiotics administered to farm animals exceeds that usually administered to sick <sup>animals</sup><sup>18</sup>, this use can justifiably be considered excessive and imprudent in terms of sanitary resistance, and therefore public health.

Today, we know that daily consumption of antibiotics does not leave our intestinal flora unscathed. We've been told for years: "Antibiotics aren't automatic", and for good reason: as antibiotic consumption increases, bad bacteria develop their defense mechanisms and become resistant; it's by reducing their consumption that the positive action of antibiotics can be preserved. Researchers at Kumamoto University have revealed, through tests on mice, that the state of the intestinal flora after ingestion of a drug treatment has a strong influence on the organism. This confirms what the Institut National de la Santé et de la Recherche Médicale (French National Institute for Health and Medical Research) has been saying.

---

46 18 - WHO, "Résistance aux antibiotiques" (<https://www.who.int/fr/news-room/fact-sheets/detail/antibiotic-resistance>).

(Inserm) had already established the harmful effects of repeated treatments on all bacteria.

- the good and the bad - that make up our microbiota<sup>19</sup>.

Remember that the microbiota is the set of bacteria that populate our intestinal flora, and that these are not necessarily bad: on the contrary, we are all also and above all made up of good bacteria, which help keep us healthy.

Taken as part of a treatment to kill bad bacteria, antibiotics will attack all types of bacteria indiscriminately: taking them excessively can therefore significantly unbalance our intestinal flora. What's more, by constantly ingesting a wide variety of drugs without any real need, the body becomes accustomed to their effects and needs increasingly powerful solutions to overcome the same illnesses. This phenomenon is known as "antibiotic resistance", i.e. the ability of a micro-organism to resist the effects of antibiotics. This phenomenon also concerns farm animals, although not all countries are affected to the same degree.

And if the effects of drug abuse on our own intestinal flora are not very pleasing, those it causes in intensively farmed animals are cause for concern in terms of public health. The widespread use of this practice by humans and animals, which is leading to an alarming increase in antibiotic resistance, is leading to

---

19 - Inra, "Réduire l'usage des antibiotiques en élevage", November 2018.

worrying epidemic returns. Diseases once controlled by our treatments are now mutating, because they have become accustomed to our intensive, uninterrupted drug intake, causing almost 25,000 deaths in Europe. The WHO predicts that this unbridled <sup>development</sup><sup>20</sup> could cause 50 million deaths a year worldwide by 2050.

To limit the damage to our health in the short and long term, the WHO recommends that the agricultural sector vaccinate livestock to reduce the need for drugs, and only give them antibiotics under veterinary supervision, in order to monitor their use and make it more relevant. An ecological approach to antibiotics, for both humans and animals, must (re)become the norm to avoid future extremely dangerous health scourges. Some researchers are taking a keen interest in the alternative of using algae. Researchers at INRA have already demonstrated the effectiveness of certain compounds found in algae in combating pathogenic bacteria present in the intestines of pigs<sup>15</sup>. This discovery opens up interesting prospects for the years to come, and could lead to a reduction in the use of antibiotics in animals and humans.

### **What are the consequences of consumption? of animal proteins on our health?**

While intensive, uncontrolled livestock farming is endangering our biodiversity, there are other very worrying and unacceptable consequences.



Although perhaps less well known to the general public, they also need to be taken into account by consumers and restaurateurs. The current excesses in meat production and consumption are dangerous for human health: we've already begun to explain this in relation to the excessive use of medication, but the list goes on.

Many of the signals warning of the harmful effects of uncontrolled meat consumption on our bodies; have already, as with the environment, gone red. In a report published in October 2015, the International Agency for Research on Cancer (IARC), assessed the dangerousness of red meat and processed meat products. It deemed the consumption of red meat to be "probably carcinogenic to humans", classifying it in Group 2A of agents for which there is concordant evidence of carcinogenicity to humans and sufficient evidence of experimental carcinogenicity in laboratory animals.

As for the consumption of processed meat products, this falls into group 1 of agents which, like tobacco, have a proven carcinogenic effect on humans, in this case colorectal cancer.

What's more, back in November 2013, a study led by Dr Guy Fagherazzi and Dr Françoise Clavel-Chapelon of Inserm's Centre de recherche en épidémiologie et santé des populations showed that foods rich in animal proteins, i.e. acidifying, increased

significantly increase the risk of type 2 diabetes, a condition characterized by chronic hyperglycemia, i.e. excessively high levels of glucose (sugar) in the blood, leading to serious health problems, particularly cardiovascular. In fact, industrially prepared meats, particularly pork and beef, as well as dairy products and cheese, are foods which, once absorbed by the body, generate an acid residue. The pancreas then manufactures more and more insulin, until it runs out, and when the quantity of insulin is no longer sufficient to counter resistance, glucose levels become abnormally high. According to the latest estimates from the World Health Organization, there were "422 million people worldwide with type 2 diabetes in 2015"<sup>21</sup>.

Robert Ratner compares diabetes 2 to the great epidemics of the Middle Ages or to AIDS, and notes that its economic consequences are particularly impressive: "One out of every three dollars spent by the Medicare social security system is spent on treating diabetes". For the record, World Health Organization statistics show that cardiovascular disease is the leading cause of death worldwide. They account for an estimated 17.7 million deaths, or 31% of the global total. Of these, 7.4 million are due to coronary heart disease and 6.7 million to stroke (according to 2015 figures). Heart attacks and strokes are generally caused by several factors

associated risk factors, such as smoking, poor diet and obesity, sedentary lifestyle and harmful use of alcohol, hypertension, diabetes and hyperlipidemia...

As Pamela A. Popper, naturopath, founder and president of the Wellness Forum Health, "the problem is the amount of animal protein we consume. In rural China, in Japan and in regions where the diet is healthier, we eat a little animal protein, but for economic reasons, these quantities are really very small. In these countries, a small piece of meat is used to season a dish for 8 people. In the West, we take a gigantic piece of meat and put it on a plate with a tiny bit of vegetables, and call it a meal. But when you eat too much protein of this kind, you put pressure on your kidneys and liver, and with animal proteins, you increase the risk of cancer. Cancer has a certain geographical distribution. The more animal food a society consumes, the more cancers and cardiovascular diseases there are".

Even if we know today that we need to moderate our meat consumption, it's always a good idea to remember that the adage "a little but not too much" applies perfectly to our consumption of animal products, given the disturbances it can cause to our health if excessive.

## **The effects of dairy products on the body**

Nor is the consumption of dairy products without consequences for our health, contrary to popular belief. Over the past few years, dairy industry lobbies have stepped up their marketing efforts, and the collective unconscious has come to accept that "dairy products are our friends for life". However, things are far from being so simple and straightforward.

Dr. Michael Herschel Greger, nutritionist and founder of the popular [NutritionFacts.org](http://NutritionFacts.org) website in the USA, has eloquently and rather humorously summed up the negative effects of milk, particularly cow's milk, on human health: "Milk is a healthy food for calves. We are the only species that drinks the milk of other species, and also the only one that drinks milk even after weaning as adults. But why is milk associated with an increased risk of prostate and breast cancer? Let's ask ourselves what milk is. It's a cocktail of growth hormones fed to a small bovine preying on the African savannah, so that it gains a few hundred kilos in a few months and avoids being eaten by a lion. This food is designed for growth. If you're an adult, these growth hormones are not good for your health."

What's more, contrary to the myth complacently spread by the dairy industry, milk consumption does not help strengthen bones and fight osteoporosis.

in women. An epidemiological study published in the British Medical Journal in 2014 and conducted in Sweden over 20 years on 61,433 women aged 39-74 and 45,339 men of similar ages over 11 years showed that the more cow's milk people drank, the more likely they were to have a bone fracture or die. The risks were particularly marked in women who had been advised to drink milk to help avoid fractures resulting from osteoporosis. This study showed that the pasteurization process only creates calcium carbonate, which has absolutely no way of penetrating cells without a chelating agent, i.e. one capable of fixing it. As a result, the body is forced to draw calcium from bones and other tissues (blood vessels, teeth, etc.) in order to buffer the calcium carbonate in the blood<sup>22</sup>.

As for men, in addition to the increased risk of prostate cancer, a 2012 study of 189 young men aged 18 to 22 by Dr. Myriam Afeiche of Harvard University's School of Public Health demonstrated a link between cheese and dairy consumption and sperm quality, with those who consumed more than three servings of whole dairy per day experiencing a 25% drop in sperm quality.

According to a study published in 2015 by the European consortium Lactimed<sup>23</sup>, the countries of the European Union are now the world's leading consumers of cheese, accounting for 45.5% of global consumption. Cheese is a highly appreciated dairy product, well established in people's eating habits.

---

22 - K. Michaëlsson, "Milk intake and risk of mortality and fractures in women and men: cohort studies", British Medical Journal, 2014.

consumption in these countries, as they are also major dairy producers. By comparison, and for the opposite reason, Asia as a whole accounts for less than 3% of the global cheese market. The adverse health effects of dairy products are therefore of particular concern to us Europeans. European Union regulations classify dairy products as recognized allergens, on a par with gluten-containing cereals and nuts. What's more, some cheeses contain over 1g of sodium per 100g - more than a packet of potato chips - which is not without consequences: the WHO points out in one of its recommendations that "high sodium intake contributes to high blood pressure and increased risk of heart disease and stroke".

So, just as we must invite our customers and consumers to reduce their meat intake, we must also encourage them to reduce their consumption of dairy products, especially cheese, and to try not to consume milk directly, but to limit its use to cooking recipes. Not to mention that, like industrial livestock farming, the dairy industry has a carbon impact estimated at several billion euros, and according to the FAO, the livestock and dairy production industry produces 18% of all greenhouse gases: 9% of all CO<sub>2</sub>, 37% of methane (which has a warming power at least 25 times greater than CO<sub>2</sub>) and 65% of nitrous oxide<sup>24</sup>. All the more reason to limit consumption.

## How to choose the right meat?

We all know the adage "You are what you eat". This is never truer than when it comes to eating meat, as we have seen. We have highlighted the direct relationship between farming conditions and the nutritional and taste quality of meat, making it all the more important for consumers to know how to recognize quality meat from non-quality meat, at a time when the range of choices is extremely vast and sorting difficult. There are many ways to visually distinguish quality meat. Once you've mastered these skills, you can make a free and responsible choice when buying meat.

Here are a few general criteria to help you recognize quality meat when you go shopping, before we look at the specific characteristics of each meat variety in the table below:

- The smell of fresh, quality meat is pleasant without being overpowering.
- If a piece looks dull, it's been on sale for some time.
- Go for cuts that indicate that the animals have been grass-fed and grazed, as these living conditions are less stressful for the animal and therefore essential for giving the meat flavor (otherwise, it will be stiff and acidic).

- With few exceptions, opt for French, local meat from reliable labels.
- Don't hesitate to ask your butcher for advice on choosing the right cut and how to cook it.



	Appearance and texture	Input and advice
<b>Beef</b>	<ul style="list-style-type: none"> <li>- Bright red flesh</li> <li>- Luminous flesh with flesh-coloured fat</li> <li>- Provides a firm, supple texture</li> </ul>	<ul style="list-style-type: none"> <li>- fat more or less present depending on the nature of the pieces</li> <li>- fat gives meat its special flavour</li> </ul>
<b>Veal</b>	<ul style="list-style-type: none"> <li>- Soft, tender flesh, more pink than white</li> <li>- firm, white fat</li> </ul>	<ul style="list-style-type: none"> <li>- Prefer free-range veal, raised under its mother's care</li> </ul>
<b>Pork</b>	<ul style="list-style-type: none"> <li>- Pearly pink flesh, white fat and supple rind</li> <li>- Firm texture</li> </ul>	<ul style="list-style-type: none"> <li>- Meat should be fine-grained and free of moisture</li> <li>- A finely marbled piece of fat will hold up better to cooking.</li> </ul>
<b>Poultry</b>	<ul style="list-style-type: none"> <li>- Beige to pink flesh, even yellow for corn-fed poultry</li> <li>- Darker or lighter flesh depending on breed</li> </ul>	<ul style="list-style-type: none"> <li>- Tight fibers and strong bones show that the animal had enough room to move around</li> </ul>
<b>Lamb</b>	<ul style="list-style-type: none"> <li>- Shiny pink flesh (rather bright)</li> <li>- Flesh color variation: from pale pink to dark pink</li> <li>- Fine-grained flesh with slightly pinkish white fat</li> </ul>	<ul style="list-style-type: none"> <li>- The intensity of the pink color is not an indication of meat quality.</li> </ul>

Table sources :  
websites carrefour, les compagnons du gout , Le gout du Bœuf.

## What about game animals?

*"We don't have two hearts, one for animals and one for humans. You either have a heart or you don't."*

Lamartine

To this day, Amerindian peoples consider human life to be profoundly linked to the natural world that surrounds it, both animal and vegetable. For them, all forms of life are sacred and indebted to the deities who created them. All living things, whatever they may be, are placed on an equal footing, and everything must be done to maintain balance. For this reason, they traditionally make gestures of thanks when an animal life is taken to feed their own when hunting. Humility, gratitude and the maintenance of harmony in relations between living beings are deeply rooted in their foraging practices; their attitude is free from any hatred or gratuitous violence towards animal life.

Their respect for the animal at the moment of death calls into question the standardization of our slaughterhouses, where gestures are mechanized or carried out without emotion, trivializing the extraordinary gift of nature that is animal meat. Although hunting is currently the subject of controversy, a number of restaurants have chosen to serve hunted game, in keeping with tradition,

originality. In Western traditions, gestures of thanks at the moment of hunting are not as common. The European Union recognizes the usefulness of hunting in regulating species present in forest ecosystems, such as wild boar. Our role is to identify the various eco-responsible practices and solutions that can be used to produce meat, and hunting is one of them. We leave it up to the individual to decide whether or not to endorse hunting, its practices and the consumption of game, just as we do the various diets and the rest of our book.

But for restaurateurs and private individuals interested in preparing game meat, we've put together a table listing the different game species most likely to find their way onto a restaurant menu or be eaten by private individuals.

For non-endangered species, i.e. those which can be hunted and eaten in general, we have added indications of meat quality to inform the reader of this consumption option. We have also included information on endangered or prohibited species, so that as many people as possible can avoid contributing in any way to their deterioration. As with our guide to marine species, which you'll find later in the chapter on the sea, we've also included the following information

to be as eclectic as possible in the transcription of information, so that the reader knows where to obtain a particular type of game according to his or her culinary objectives, while respecting the protection of endangered species.

It's worth pointing out that we don't encourage chefs to serve game on the menu, since hunting doesn't really help species conservation or respect for animal welfare. Less Saves the Planet believes that organic farming of the species preferred by the restaurateurs concerned would be a much more respectful solution for biodiversity as a whole. This would be all the more feasible given that a fifth of French game is already farmed, i.e. some 4.5 million animals<sup>25</sup>.

Nevertheless, if the preservation of hunting practices is a subject dear to our readers, we must encourage those concerned to hunt only species that are neither protected nor endangered, and this by cross-checking the legislation of the various countries so as not to be influenced by legislation that is more lax than another on the subject. All hunters and restaurateurs concerned must assume their responsibilities with regard to the conditions under which game is obtained, so as not to harm the natural balance of species and their ecosystems.

---

25 - <https://www.lci.fr/population/un-animal-sur-quatre-tue-par-les-chasseurs-provient-il-vraiment-d-elevages-2134608.html#:~:text=Ces%20informations%20%C3%A0%20la%20marge,%C3%A9levage%2C%20soit%201%20cinqui%C3%A8me.>

Table of game animals		
Species	Geographical distribution	Special information
<b>Regulated game that can be eaten</b>		
Sika deer / Red deer Hinds	Euraise	<p>Less fatty than beef, European venison is a healthy meat, low in cholesterol and rich in iron and protein.</p> <p>The venison leg is used to prepare a civet. The meat must marinate for at least one night before cooking. The back of the venison is a very tender piece. Boned, it can be cooked roast or as steaks or steaks.</p> <p>The meat of hinds is less fatty than that of beef, red in color and particularly tender. Fine and tasty, it is rich in potassium, iron and phosphorus.</p>
Chamois	Eurasia	The chamois of the Alps and the isard of the Pyrenees are game species whose hunting is authorized (ministerial decree of June 26, 1987, modified by that of February 15, 1995). The chamois and isard hunting plan was made compulsory throughout France by the ministerial decree of July 31, 1989.
Deer	Species classified game subject to compulsory hunting plan Eurasia	<p>One of the least fatty game meats (three times less caloric and twenty-five times less fatty than lamb), with tasty flesh rich in iron, phosphorus and protein, and low in lipids and sodium.</p> <p>Young venison meat tastes best. Its tender, dark-red flesh doesn't need to be marinated before cooking, and offers a delicate taste to the palate. Harder cuts, on the other hand, should be marinated for 24 to 48 hours before cooking, as in a civet for example.</p>
Suede	Europe / some parts of America (North and South) and Southern Oceania	Similar to venison, but less dry and strong than venison. It is cooked like beef in the form of tenderloin, roast, steak and stew.
Common thrush / Litorne / Mauvis / Musci- enne	Europe and Asia	It has a distinctive flavor and can be eaten as a roast (stuffed or not).



Brown hare	Europe / West Asia / Africa / Oceania / North and South America	<p>Very low in calories and fat, but rich in iron and easily absorbed.</p> <p>The hare, which never feeds, has fine, refined brown flesh (unlike rabbit, which is white). It's tastier and less fatty than rabbit. Elke can be cooked differently depending on the age and weight of the hare.</p> <p>When the hare is older and weighs between 3 and 5 K, its meat lends itself to the preparation of civ- ets, pâtés and terrines. When it's younger, we recommend roasting or sautéing it, as well as the legs and filets.</p>
Wood pigeon Turtle dove	Europe / Middle East / North Africa	Lean, fine-fleshed meat, rich in iron, protein, potassium, phosphorus and vitamins.
Water hen	Everywhere in the world except deserts and poles	
Wild boar	Europe	<p>The richest game meat in lipids, but low in fat and rich in phosphorus and potassium. Nutritionally similar to chicken.</p> <p>For a civet, the meat must be marinated overnight before cooking. As a roast from the haunch, it can be eaten pink or medium-rare.</p>
Olive teal	Northern and Western Europe / Asia	<p>The most difficult duck to hunt. Its coveted flesh is characterized by its brown color and bitterness.</p> <p>It can be fricasseed, roasted or stewed.</p>
<b>Protected game, eat sparingly</b>		
Skylark	Found throughout the Northern Hemisphere and in Australia	Not directly threatened by hunting, but by habitat loss due to changes in agricultural practices. However, certain hunting practices for this species are prohibited or not recommended (hunting with glue, nets, etc.).
Red godwit	Found in northern Europe / northern Asia / on the coasts of Africa, Asia and Australia during migration.	

Woodcock	Eurasia	<p>One of the most popular birds among hunters and their families. Its tender, fatty flesh can be pared for 4 to 6 days to prepare a ragout or terrine, or simply roasted.</p> <p>Hunted in all EU member states and neighboring regions (Balkans, former USSR) by both resident and foreign hunters, except in the Netherlands, Belgium (Flanders), Slovenia and German-speaking Swiss cantons.</p> <p>Its sale is prohibited in France.</p>
Wheat quail	Eurasia and Africa	<p>As good a source of protein as duck and guinea fowl. Its firm white flesh is very lean and easy to cook (casserole, roast or grilled). It's best to choose a plump bird.</p> <p>Fine and tasty, it can be sautéed, grilled or stuffed.</p>
Mallard / Pintail / Chipeau / Whistler / Shoveler	Oceania's Northern and Southern Hemispheres	<p>Its meat is less fatty than that of farmed duck and rich in iron, vitamin D and phosphorus.</p> <p>In the kitchen, it can be cooked in the oven or in a casserole, stuffed or not. It is imperative that the meat is pink after cooking, as overcooking makes it too firm. The meat of a young duck is best roasted, basted with port or Madeira, for example; the meat of an older duck is best fricasseed.</p>
Barking knight / Harlequin / Fighter / Gambett	Assessed and regulated / Protected  Eurasia / Sub-Saharan Africa / Asia and part of Oceania	<p>The barking redhorse is not subject to any specific regulatory measures. The species is huntable in France. Harlequin, warbler and redshank, on the other hand, are protected species.</p>
Pheasant	Assessed and regulated / classified as "protected fauna" but "huntable" under the Bern Convention (CITES).  Asia . Europe / North America / Australia	<p>Firm, flavorful flesh, high in protein and low in fat.</p> <p>In the kitchen, it can be roasted or cooked in a casserole, stuffed or not, with cognac or wine, and served with porcini mushrooms, fresh pasta or potatoes cooked with bacon and onions. It lends itself perfectly to the preparation of a fumet. The achatir of the pheasant hen is finer and less dry than that of the pheasant.</p>



Partridge (gray/red)	Classified as a "concern minor" on a European scale  Europe / Asia / Africa / North America	Meat rich in protein, phosphorus and iron, yet low in fat and sodium (i.e. full of "good fats" for bones and heart).  Partridges are less fatty than chickens, and young partridges have tender, melt-in-the-mouth flesh suitable for roasting or grilling. The firmer flesh of the pedrix is perfect braised in a casserole or prepared as a pâté, estouffade (slow, covered cooking) or salmis (stew).
<b>Endangered game, not to be eaten</b>		
Snipe des marais / sourde	Europe	
Black-tailed godwit	Everywhere in the world Central/South America	
Rabbit garenne	Found in the wild on all continents except Asia and Antarctica	
Blackbird	Europe / Asia / North Africa / Australia / New Zealand	
Greylag goose	IUCN Red List / Eurasia and Southern Oceania	
Crested Lapwing	Eurasia / North Africa	

We do not mention a precise seasonality for each species, as the opening and closing dates of the hunting seasons depend on the legislation and the flora and fauna of the various countries and regions. Although it is generally established that the hunting season extends from the end of August

/ In order not to encroach on the animals' reproduction period, it is advisable to obtain local information for full details of the statutes and legislation in force in your own area of residence and/or activity. The European Union is working to harmonize hunting seasons between different countries, while banning the most controversial hunting techniques.

Hunting techniques vary according to the nature of the game, its habitat, the number of people involved and any regional traditions. Here's an overview of the main techniques that have been identified and are still in use.

Hunter's tips to complete the picture: when a bird's plumage is more than 50% white, there's a good chance it's protected; and if you have to choose between a sedentary bird and a migratory bird, always favor the migratory bird.

MAIN HUNTING TECHNIQUES	
<b>Stalking hunting</b>	Stalking, also known as "silent hunting" or "individual hunting", consists in silently stalking an animal in order to get as close as possible to it and shoot it. Stalking is carried out from a stand in a place where animals frequently pass by, enabling the hunter to conceal himself to reach the game. It should be noted that these hunting methods rely on a long period of observation of the animals. This method of hunting is not recommended for novice hunters.
<b>Driven hunting</b>	The preferred hunting method of the French, the battue consists of bringing the game to a group of posted shooters. In a battue hunt, there are two types of roles: the beaters and the posted shooters. The aim of the beaters is to direct the game towards the stationed shooters, who then shoot to kill it. This hunting method is very popular, and is used for both small and big game hunting.
<b>Hunting / Venery</b>	Hunting with hounds is an ancestral form of hunting, divided into big game and small game, in which a pack of hounds pursues an animal using their sense of smell. Man's role in this type of hunting is to control the pack of dogs stalking the game.
<b>Hunting without a gun</b>	Hunting without firearms, this category includes archery, raptor hunting, digging and ferreting (respectively fox / badger / coypu hunting and ferreting to scare rabbits from their burrows).
<b>Glue hunting</b>	Authorized in regions where it is traditional, it is the subject of a complaint lodged against France with the European Commission by the League for the Protection of Birds. The practice involves spreading adhesive tape on a tree, placing bait on the tree, and then retrieving the trapped birds by the hunter.
<b>Net / pante hunting</b>	Very popular in the South-West, this method involves trapping larks using nets laid on the ground, which close on the bird once it has landed.
<b>Tendelle hunting</b>	This trap consists of positioning two twigs on which to balance a flat stone with bait in the middle. As the bird passes over it, the twigs, and therefore the stone, fall off, killing it.

<b>Chasse au collet</b>	Interdite en France, cette technique reste utilisée dans les pays moins portés sur les droits des animaux et par les braconniers. Le collet est un fil de laiton tiré sur le passage de l'animal avec un nœud coulant qui l'étrangle une fois qu'il est pris.
<b>Chasse à la matole</b>	Dans une cage ouverte sont disposées des graines qui servent d'appât ; une fois que l'oiseau y est entré, la petite tige qui maintenait la porte ouverte tombe et l'oiseau s'y retrouve enfermé.

Less Saves the Planet in no way endorses hunting methods that are disrespectful of animal welfare and therefore not based on the principle of respect mentioned in the introduction. Some are illegal in various countries, others are controversial and subject to legal scrutiny: not only do we urge you to respect the jurisdictions in force in your region, but we also encourage you to favor techniques least likely to cause the animal suffering: hunting with a rifle rather than a snare, for example. Nor do we recommend hunting with hounds, as the welfare of dogs and horses is as much at stake as that of the hunted animal. Let's take the example of the horse, which we don't tend to think about, but which will indeed suffer the situation: hunting with hounds is based on permanent aggression, insofar as the riders stop them suddenly, only for them to gallop off again a few moments later. The horse's heart is put to the test, and it's not uncommon for him to die of a heart attack during this exercise. Dogs and prey are no better off in terms of stress and animal suffering<sup>26</sup> .

### **The label reference: a guide to better consumption**

As mentioned at various points in this chapter, intensive production of meat, but also eggs and milk, can be highly detrimental.

for the well-being of the animals it exploits and, by the same token, for the health of consumers who choose, consciously or not, to support these inhumane practices by buying the products they produce. To avoid entering this negative spiral, here's a very accessible solution that complements our recommendations for choosing meat wisely: find out which labels you should choose in your daily food choices.

A label is there to inform the public about the objective properties and qualities of a work, an environment, information, a building, a procedure, and so on. In the consumer context, it's a collective brand that takes the form of distinctive signs (name, logo, etc.) and can be used by the various brands that comply with its specifications. There are all kinds of labels, and food labels, along with cosmetics labels, are among the best known. Their aim is to ensure and facilitate recognition of certain product characteristics. They are established to certify, by means of an iconographic reference on its packaging, that it presents a certain level of quality or respects a certain number of criteria predefined by certifying bodies, such as the Institut national de l'origine et de la qualité (INAO) or the Ministry of Agriculture. There are many, but not all

good to go. It's important to distinguish the real labels from the bogus ones that abound for marketing purposes only. That's why we at Less Saves The Planet recommend choosing organic certifications. Choosing a certified organic label means selecting products that are more eco-friendly (and ethical, generally speaking) than those sold on the market on average. What's more, unlike other labels, the criteria used for organic products are generally much more reliable. The "Elected Product of the Year" and "Recognized Flavor of the Year" labels, for example, are based solely on the product's gustatory data, and not on its qualitative composition or production methods.

The rise of "organic" in the food supply began some years ago, and is also accompanied by the promotion of products that respect - or are supposed to respect - animal welfare. Since the early 2010s, private-sector initiatives, particularly in the retail sector, have favored meat products that meet the ethical standards recommended by the OIE: the "Cruelty-Free" label for certain products (such as pork sandwiches sold by the Marks and Spencer supermarket chain) in the UK, and in the dairy sector in the Netherlands and Germany; these products are, of course, more expensive for the consumer.

In Germany, a "welfare" label was created in 2013 for the pig and poultry sectors. Held by the National Federation for Animal Welfare, it has two levels: one or two stars. It guarantees more space for the animals and various enrichments, as well as restrictions on the use of antibiotics. Another example is the decision by the French chain Monoprix to ban eggs from caged hens from its supermarket shelves (even if they have been fitted out in accordance with the 1999 European Directive). The Lidl chain, for its part, although surfing on the low-cost (discount) bandwagon, offers an egg section entitled "Respect de l'animal"<sup>27</sup>.

We also note that marketing professionals in the agri-food sector are increasingly seeking to enhance the value of their products through the attributes of "pastured" and "free-range". Eggs are the product with the most standards in this respect, and have long been categorized. France, for example, is considering a ban on battery farming. A brand like Lactel has launched the "L'Appel des Prés" brand as part of its "new supply chain committed to animal welfare and respect for the environment", which guarantees 200 days of grazing a year for its dairy cows. Similarly, the "C'est qui le patron?!" brand guarantees 6 months' grazing for its hamburger steak, highlighting its concern for animal <sup>welfare</sup><sup>28</sup>.

---





27 - The Meat Atlas, available online (<https://www.boell.de/sites/default/files/lat-lasdelavivande2.pdf>).








28 - [https://www6.inrae.fr/productions-animales/content/download/3028/30692/version/2/file/Prod\\_Anim\\_2007\\_20\\_1\\_01.pdf](https://www6.inrae.fr/productions-animales/content/download/3028/30692/version/2/file/Prod_Anim_2007_20_1_01.pdf)



But even within organic labels, there is still a need for sorting, although certifications in Europe remain more reliable than in some countries that are less sensitive to this type of problem. Asia, in particular, offers few organic certifications for certain products, and those that do exist sometimes have unclear, tolerant specifications. A certain critical spirit is therefore required to distinguish reliable labels from less reliable ones.

To help you find your way around, we've compiled a list of the most recognized and demanding certified organic labels, guaranteeing a multi-responsive purchase. This list is by no means exhaustive - some countries, like France, have dozens - but it will help you find your way around the world.

	Label Bio	Eligibility criteria
European	<p>Eurofeuille</p>  <p>MSC label</p>	<ul style="list-style-type: none"> <li>-&gt; 100% of ingredients are organically grown.</li> <li>-&gt; a minimum of 95% organic agricultural produce in the case of processed products, if the remainder is not organic and is expressly authorized.</li> <li>-&gt; The label bears the name of the producer, processor or distributor and the approval number of the certification body.</li> <li>-&gt; The product complies with the rules of the official control and certification system.</li> </ul>
France (main labels)	<p>Agriculture Biologique (AB)</p> 	<ul style="list-style-type: none"> <li>-&gt; At least 95% of the ingredients are organically grown.</li> <li>-&gt; Guaranteed GMO-free production with a tolerance of 0.9% in the event of adventitious contamination.</li> <li>-&gt; Agronomic practices that respect natural balances, soils, biological cycles, the environment and animal welfare.</li> <li>-&gt; Compliance with regulations in force in France.</li> </ul>
	<p>Ecocert</p> 	<ul style="list-style-type: none"> <li>-&gt; ? 95% minimum of ingredients are of natural origin.</li> <li>-&gt; at least 10% of total ingredients are organically grown, with 70% fair-trade fiber.</li> <li>-&gt; 5% maximum are part of a very restricted list of synthetic molecules used in particular as preservatives. These molecules must be specified on the packaging.</li> <li>-&gt; Ecocert products must all bear the European organic label and ensure a decent minimum wage for workers and producers.</li> <li>-&gt; Synthetic fragrances and colorants, silicones, parabens, glycols, etc. are prohibited.</li> <li>-&gt; Animal raw materials are not authorized, with the exception of animal products and by-products that do not directly endanger animals, and whose extraction has no harmful effect on ecological balances (beeswax, propolis, honey, milk, etc.).</li> <li>-&gt; Product testing on animals is prohibited.</li> </ul>
	<p>Bio Cohérence</p> 	<ul style="list-style-type: none"> <li>-&gt; Products only available in organic stores or direct sales.</li> <li>-&gt; The label guarantees humanist well-being and requires that all organic farming structures be and receive a fair income.</li> <li>-&gt; No mixing of organic and non-organic production. Farm activities must be organic or non-organic in conversion to organic farming.</li> <li>-&gt; The minimum GMO contamination threshold is limited to 0.1%.</li> <li>-&gt; At least 50% of animal feed must be produced on the farm, and 80% for herbivores.</li> <li>-&gt; Preservation of the principle of the link to the soil, which disappeared with the European label.</li> <li>-&gt; Authorized veterinary treatments are more restricted than with the European label.</li> </ul>

<p>Bio France (main labels)</p>	 Bio Partenaire	<ul style="list-style-type: none"> <li>-&gt; Compliance with European organic regulations.</li> <li>-&gt; a guarantee of environmentally-friendly production.</li> <li>-&gt; Certified organic and fair trade products.</li> <li>-&gt; Support for local French production, with fair remuneration for producers.</li> <li>-&gt; The structures involved in the label must draw up contracts guaranteeing producers prices and quantities purchased over a minimum period of 3 years.</li> <li>-&gt; The label is only available in specialized organic stores in France.</li> </ul>
<p>Label Rouge</p>	 Label Rouge	<ul style="list-style-type: none"> <li>-&gt; Created in the 1960s, Label Rouge certifies that a foodstuff or unprocessed, non-food agricultural product is of a higher quality than a similar, everyday product (this also applies to seafood or non-food agricultural products such as Christmas trees).</li> <li>-&gt; This superior quality is regularly assessed and monitored through sensory tests carried out on products eligible for certification.</li> <li>-&gt; Label Rouge is open to products of any geographical origin, including those from outside the European Union.</li> </ul>
<p>Canada</p>	 Biologique Canada	<ul style="list-style-type: none"> <li>-&gt; Products must contain no less than 95% organic ingredients certified according to the requirements of the Bio-Canada system (the organic certification system described in Part 13 of the Canada Food Safety Regulations, which govern the production of organic products).</li> <li>certification of organic products in accordance with regulatory requirements and standards and applicable guidelines).</li> </ul>
<p>Switzerland</p>	 Biosuisse (and its Bud brand)	<ul style="list-style-type: none"> <li>-&gt; All agricultural production and processing of organic products.</li> <li>-&gt; Level A (which concerns 97% of certified products): guarantees environmental protection (soil, air, water) and production methods (pesticides, fertilizers, veterinary medicines, additives).</li> <li>-&gt; Level AA: almost identical to a bi-ological agricultural label.</li> </ul>
<p>Japan</p>	 Japan Agriculture System Bio	<ul style="list-style-type: none"> <li>-&gt; A less stringent label than that of the EU, but one that certifies a more local and healthier production method (notably with as few pesticides as possible) than for the rest of national production, i.e. certification for 12,000 farmers and 0.5% of the country's cultivated area.</li> </ul>
<p>China</p>	 Wugonghai	<ul style="list-style-type: none"> <li>Wugonghai ("harmless agricultural products")</li> <li>-&gt; Limits the presence of chemical elements and residues in the final product.</li> </ul>
	 LÜsse shipin	<ul style="list-style-type: none"> <li>LÜsse shipin ("green products")</li> <li>-&gt; Level A (which concerns 97% of certified products): guarantees the protection of the environment (soil, air, water) and the production model (pesticides, fertilizers, veterinary medicines, additives).</li> <li>-&gt;AA level: almost identical to an organic farming label. All Chinese organic products must bear the "Organic" label.</li> </ul>



## **Recognizing organic eggs and milk when shopping**

In addition to certifications such as the European organic logo or Label Rouge, organic eggs can be distinguished from intensively farmed eggs by their coding. Today, consumers can choose between five categories of egg production methods: free-range eggs (code 1), free-range eggs (code 2), caged eggs (code 3), organic eggs (code 0) and Label Rouge eggs. The codes are written on the carton (next to the labels, where applicable) or on the shell: it is therefore very important not to rely on the packaging to make a responsible choice, but to look for the certified criteria used to classify the farming method. In Europe, the classification is the same from one country to the next, and the visual mark on the can is the European organic logo.

To be certified organic, eggs must meet a certain number of criteria concerning the welfare of the hens, which are monitored by recognized authorities. The hens must be raised in the open air, each with a minimum of 4 m<sup>2</sup> of space, on a farm with no more than 3,000 hens per coop. Their feed must also exclude any synthetic colorants designed to alter the color of the egg yolk, and be 100% vegetable, mineral and vitamin-based, with at least 95% of the raw materials coming from organic farming. Poultry farms

who apply for organic certification are inspected by a certification body, which verifies their compliance with these requirements<sup>34</sup>.

For milk, the Eurofeuille logo is used to classify different European countries as organic, as is the case for other food products. Nearly 880,000 dairy cows were certified organic in the EU in 2016<sup>35</sup>, thanks to a highly regulated breeding and production system. Dairy cows must be born and raised on organic farms, or raised organically for a minimum of six months before their milk can be marketed under this designation. Cow numbers must be limited to avoid soil compaction, erosion or pollution, and cows must be able to graze as soon as weather conditions allow.

In addition, their feed must be organic, and calves must be fed preferably on mother's milk for at least three months. Barring exceptional conditions, cows must not be tethered or isolated, and soft medicines must be preferred to antibiotics (which are therefore kept to a minimum). Finally, cowsheds must be laid out in such a way as to promote animal hygiene, ventilation and light<sup>36</sup>.

---

34 - Study carried out in 2014 by the National Federation of Agriculture (FNAB) in conjunction with the Ministry of Agriculture, Food and Forestry ([https://www.fnab.org/images/files/reglementation/2014Fichesreg-BovinsLait\(1\).pdf](https://www.fnab.org/images/files/reglementation/2014Fichesreg-BovinsLait(1).pdf)).

35 - LACTIMED, "Le marché des produits laitiers, étude sur les débouchés internationaux", 2015.

36 - Lactimed, The dairy products market, study on international outlets, 2015

An organic cow will also be milked less often than an intensively-farmed cow, i.e. once in the morning and once in the evening.

### **What diets are available to us today, and which ones should we choose?**

In view of everything we've highlighted so far, should we stop eating meat and animal products in general? That's up to each and every one of us. It is clear, however, that in our own interests, in the interests of animals and, of course, in the interests of the planet, we must drastically reduce our consumption. This option is within our grasp.

Those who refuse to adopt a 100% vegan diet can simply lower their daily intake of animal proteins, which will save them money and enable them to buy better quality meat, ethically and sustainably produced in a reasoned and organic way, respectful of animals, soils and terroirs. For those who want to continue eating meat, the best way to escape the industrial diet is to adopt a "flexitarian" diet, i.e. one in which meat is consumed less frequently. The flexitarian diet is also the diet of omnivores who want to consume better on a daily basis: we'll see how to do this with regard to the

and dairy products in the following chapters. As far back as the 12th century, the Rhenish mystic Hildegard of Bingen, proclaimed Doctor of the Church in 2012, recommended, as a true avant-gardist, eating less meat and dairy products, and more cereals, legumes and fruit in order to lead a healthy life, in every sense of the word<sup>37</sup>. What intuition! She was even a genius when, centuries before her time, she understood the importance of acid-base balance.

The European Food Safety Authority (EFSA) has set the "Nutrient Reference Value" (NRV) or The "recommended daily allowance" for protein is a maximum of 50g per day<sup>38</sup>.

For its part, the WHO estimates that it should represent 10-15% of daily "total energy intake" (TEI)<sup>39</sup>. Meat is not the only source of protein in our diet. Notwithstanding dairy products, which are also farmed, and fish, whose over-fishing and over-consumption we'll see later, vegetable products are also a significant source of protein. Microalgae, particularly chlorella and spirulina, contain the highest levels of protein in the plant and even animal kingdoms, averaging 50-70 g per 100 g - three times more than meat.

---

37 - W. Strehlow, *L'art de guérir par l'alimentation selon Hildegard de Bingen: Recettes, traitements et régimes*, François-Xavier de guibert éditeur, 2007.

38- Regulation No. 1169/2011 of the European Parliament and of the Council of October 25, 2011

39- World Health Organization, Food Agriculture Organization, "Expert Consultation on Diet, Nutrition 79 and the Prevention of Chronic Diseases", March 2013.



Cereals contain an average of 10g of protein per 100g, and pulses an average of 10g per 100g when <sup>cooked</sup><sup>40</sup>. The other advantage of vegetable products is that, with the exception of tofu and oleaginous fruits, they contain practically no lipids. However, it must be recognized that the nine amino acids essential to our body are not present at the same time in these plant foods, as they are in animal products: you need to combine different sources of plant proteins to find them all.

We can draw inspiration from the nutritional criteria developed in 1993 by the Swiss Fourchette Verte label for restaurants in the Swiss Confederation, which aim to encourage consumers to adopt healthier eating habits: give preference to highly nutritious oils (e.g. rapeseed oil, olive oil), limit the amount of saturated fats, give preference to vegetables and fruit at every meal, give preference to starchy foods (preferably wholemeal) at every meal and in sufficient quantity, offer meat, veal, fish, eggs, cheese and other protein-rich foods in moderate quantities, offer a low-salt cuisine, vary the foods and their preparation<sup>41</sup>.

## To cover our body's needs, Less Saves

---

40 - World Health Organization, Food Agriculture Organization, "Expert Consultation on Diet, Nutrition and the Prevention of Chronic Diseases", March 2013.

41 - Green Fork website ([https://fourchetteverte.ch/media/filer\\_public/29/04/29041eb9-1e21-4897-bf17-bc8fa0eb286a/mets\\_gras\\_en.pdf](https://fourchetteverte.ch/media/filer_public/29/04/29041eb9-1e21-4897-bf17-bc8fa0eb286a/mets_gras_en.pdf)); <https://www.mgc-prevention.fr/matieres-grasses-cuisiner/#:~:text=Les%20mati%C3%A8res%20grasses%20%C3%A0%20favoriser%20en%20cuisson&text=Pour%20une%20cuisson%20%C3%A0%20forte,riches%20en%20acides%20gras%20satur%C3%A9s.>

The Planet recommends 130g of meat in a meal, which is more than enough.

If we all made this decision and adopted this diet, the environmental impact would simply be colossal.

In any case, changing our eating habits - in both developed and developing countries - means answering three fundamental questions for our future:

- Is meat good for the planet?
- Is meat good for my health?
- Is it fair and ethical to treat animals as if they were objects devoid of feeling? Determining the degree to which we are prepared to invest in order to answer these three questions, each according to our own scale of values and given the situation, and gaining a better understanding of the nutritional contributions of the main diets, seem to us to be good ways of helping us to make our diets more lucid and more responsible. This would help us to make informed food choices and to respond personally and on a daily basis to the major food challenges of our time: the preservation of nature, human health and animal health.

We've put together a table showing the different diets available today, and their individual characteristics, so that you can make a reasoned decision tailored to your own situation.

	Food consumed	Restrictions and special features	Special features of the diet	Nutritional benefits of foods consumed
<b>Omnivore</b>	Meat / fish  Fruits / vegetables  Cereals  Milk / eggs	No food is forbidden	No deficiencies or increased cancer/cardiovascular risk if well balanced	<b>Meat:</b> iron, vitamin B, protein  <b>Fish:</b> minerals, proteins, vitamin D, omega 3  <b>Fruits and vegetables:</b> vitamins, minerals, antioxidants  <b>Cereals:</b> fibre, vitamins B and E, minerals, essential fatty acids, vegetable proteins  <b>Eggs:</b> protein, vitamins, trace elements, antioxidants, good for the eyes  <b>Milk:</b> calcium, vitamin D, minerals
<b>Végétarien</b>	Fruits / légumes  Céréales  Lait / œuf	Tout est consommable en-dehors de la viande et du poisson	Régime riche en fibres si bien pratiqué  Réduit efficacement les risques de diabète, du cancer du côlon et les troubles du transit	<b>Fruits et légumes :</b> vitamines, minéraux, antioxydants  <b>Céréales :</b> fibres, vitamines B et E, minéraux, acides gras essentiels, protéines végétales  <b>Œufs :</b> protéines, vitamines, oligoéléments, bonnes graisses, antioxydants bons pour les yeux  <b>Lait :</b> calcium, vitamine D, minéraux
<b>Végan</b>	Fruits / légumes  Céréales	Aucun produit d'origine animale consommé	Le risque de cancer est encore plus faible que chez les végétariens et la perte de poids est favorisée	<b>Fruits et légumes :</b> vitamines, minéraux, antioxydants  <b>Céréales :</b> fibres, vitamines B et E, minéraux, acides gras essentiels, protéines végétales

This table shows that each diet has its own advantages, depending on how it is implemented: an omnivorous diet can bring a large number of nutritional benefits if practised in a balanced way, while a vegan diet will have a very positive impact on health if the iron and vitamin B12 deficiencies it can entail are properly managed. The difference lies mainly in the values defended, with animal welfare and environmental protection being the main motivations for vegetarian and vegan diets in general. The flexitarian diet, which consists of limiting consumption of meat, fish and even animal products in general, and favoring organic, seasonal and animal-welfare-friendly sources of supply, is the most effective way of ensuring a balanced diet and nutritional intake, while limiting the impact on the environment and animals.

By limiting daily meat consumption to 130g, as *Less Saves The Planet* advocates, you can avoid the deficiencies that vegetarians and vegans may encounter, improve your cardiovascular health, prevent diabetes, hypertension and cholesterol, and promote weight loss, all while making a significant long-term contribution to the environment and the animal cause.

According to 2016 FAO data, average meat consumption in Europe is estimated at 80 kg per capita.

year. Reducing it without completely abandoning it would have the dual advantage of limiting the harmful consequences of livestock farming (greenhouse gas emissions, very high water consumption, land clearance, animal mistreatment, etc.) and preserving jobs in this sector (which today includes 1.3 billion diverse and varied workers)<sup>42</sup>.

We should therefore prefer to raise our animals on pasture rather than in cramped cages, and feed should be produced locally rather than shipped from thousands of kilometers away. But let's not forget that the livestock industry, when it's intensive, not only weakens the soil and the environment, but is also more polluting than transport, and that local does not necessarily guarantee everything we've talked about. It is therefore important to check that meats produced close to home, which can be attractive to well-intentioned buyers, are as respectful of the environment and animal welfare as others on the market, and to strive to find a happy medium between local production, which is sometimes highly polluting, and geographically distant yet eco-responsible meat production.

The aim is not to punish consumers by prohibiting the consumption of meat and animal products in general, but to encourage them to be vigilant about the real energy they consume.

---

84 42 - B. Bajzelj et al, "Importance of food-demand management for climate mitigation", Nature Climate Change, 2014.

and avoid misleading shortcuts. From there, each individual is of course free to take this into account or not, and to choose his or her diet according to his or her own personal repertoire.

How can restaurants take concrete action with the Less Saves The Planet label?

We've explained just how serious are the environmental consequences of unbridled meat production worldwide. There is a growing awareness of this, both in the so-called

This is true both in "rich" countries, where the search for an alternative mode of development is gaining in consensus, and in developing countries, which are often the first to be affected by the most catastrophic effects of global warming: desertification, rising ocean waters, air and water pollution, the multiplication of increasingly destructive natural upheavals... Everyone now realizes that we can no longer avoid a profound change in our habits in all areas if we want to save the planet. Meat consumption is at the heart of this problématique, since reducing it significantly by 2050 would be enough to achieve the objective defined by the COP 21 Paris Agreement: to limit global warming to less than 2° C26. Making this choice is vital. But above all, it is far from unattainable. This is what our charter es-

saie to show through its commitments: with a little imagination and good will, it's entirely possible for restaurateurs to find interesting alternative solutions.

It's also our duty to educate and encourage end consumers to adopt dietary behaviors that are in line with an environmental approach to preserving the planet's resources, such as the flexitarian diet, while respecting the principles set out in the Less Saves The Planet charter.

As mentioned above, Less Saves The Planet has set a limit of 130g of meat per person per meal, and is asking restaurateurs to offer at least one vegan starter and one vegan dish on their menus. A vegan dish is one that contains no animal protein, but must be as nutritious and balanced as a dish containing meat. It is up to the restaurateur to advise the customer to limit his or her meal to 130 g of animal protein, and for the customer to choose whether or not to eat a vegan dish. Establishments wishing to take this step-by-step approach can simply start by presenting a Less Saves The Planet menu that offers no more than 130g of meat per meal. Matured meat is limited to 100 g per person per meal, since meat loses up to 30% of its weight during maturation. For those who wish to cleverly hijack our recommendations, it's not a good idea to add more butter or cheese to your dishes.

Today, restaurants serve portions of fromage that are between 60 and 80 g. Less Saves The Planet also asks chefs to reduce this amount of cheese to 40 g and to add a wider variety of accompaniments, such as salads, fruit and dried fruit. All they have to do is explain this decision to the customer and point out the benefits for everyone. Here too, it's important to set an example. Reducing excesses and favouring only organic dairy products and cheeses - in other words, encouraging a measured yet gourmet approach to these products we love so much - are ways of leading consumers along the path to a healthy diet, both for their own health and for the health of the planet.

Creating a card that respects the simple, fairy-tale principles we aim to uphold is within the grasp of any manager with an awakened conscience (please refer to the menu at the end of the book).

Secondly, in order to offer quality meat to consumers, restaurateurs and hoteliers must be able to justify that their meat comes from ethical and traditional livestock rearing, with due regard for animal welfare. This is why organic and regional meat and dairy products are so highly valued by the label. Whether in the fight against deforestation, to preserve our land or for the quality of our meat, the animals must have been fed without GMOs and the cattle must not have been fed on grain.



These objectives are perfectly attainable. All we need to do is become aware of our role as hoteliers-restaurateurs and join forces to show our customers, and consumers in general, the way to responsible consumption of meat, which, because it will be rarer and ethically raised, will be of much higher quality. And let's put our trust in the creativity of our chefs and their ability to innovate and design dishes in which the share of meat will be reduced to 130 g per person per meal, which will include more cereals, fruit and legumes, and will be enhanced in a subtle and elegant way through the arts of the table. If we have highlighted all the problems we encounter in the context of today's intensive livestock farming, it is to emphasize the crucial importance of our daily consumption choices, which would benefit from being as ethical as possible in every respect. The conclusion is self-evident: let's eat less - if not no more - meat. If we do, our health will improve and we'll live longer, in good conditions. What's more, we'll be fighting against the treatment inflicted on animals reared in these conditions, which is considered disgraceful by a growing majority of people. We need to collectively activate a number of levers, and it's by showing as many people as possible which ones will be truly effective in the long term that we'll be able to change the situation in the best possible way.

As a hotelier-restaurateur or simply as a consumer, let's be aware of the complexity of certain realities and the real causes behind pollution and animal welfare, so that we can adapt our lifestyles and source meat and other animal foods responsibly. It may not seem like much at first glance, but we're convinced that it's through what seem like small things that we can ultimately save the planet.

*"Today, the only condition for survival lies in establishing a more humble relationship with the planet."*

Alain Gras



*"We don't inherit the land from our parents, we borrow it from our children."*

Antoine de Saint-Exupéry

### 3 - Protecting the seas and oceans -

---



"Homme libre, toujours tu chériras la mer!" exclaims Charles Baudelaire at the start of his famous poem "L'homme et la mer" (Man and the Sea). Either freedom is in short supply, or the love of the sea is being lost, because our planet's vast ocean expanses are in peril today. The oceans are saturated with waste, plastics, polluted water and carbon dioxide. Today, not only are the oceans' fishery resources being plundered, but their habitats are being destroyed. The loss of marine biodiversity weakens the ocean ecosystem and its ability to resist disturbance, adapt to climate change and play its role as an ecological and climatic regulator on a global scale.

On the other hand, fish is often seen as an alternative to meat. Reputed to be healthier, less rich in saturated fats and, to put it bluntly, more "eco-friendly", it is favored by consumers who wish to adopt an ethical behavior and believe that opting for a diet consisting mainly of seafood products is a good idea.

action, for the planet and for their health. But nothing could be further from the truth.

### **Marine biodiversity**

Today, the biodiversity of the seas and oceans is in great danger, even in very deep waters. Marine pollution, which results from the presence of waste, particularly plastic, in the oceans, or from the release into the environment of excessive quantities of toxic physical or chemical products, also entails major health risks for humans.

Due to increasingly industrial fishing, it is being put to the test by anthropic pressure. In its latest 2020 report, the FAO points out that "the proportion of fish stocks exploited at a biologically sustainable level declined from 90% in 1974 to 65.8% in 2017. Conversely, the percentage of stocks exploited at a biologically unsustainable level increased, particularly in the late 1970s and 1980s, rising from 10 percent in 1974 to 34.2 percent in 2017. In 2017, stocks exploited at the maximum sustainable level accounted for 59.6 percent of assessed stocks, compared with 6.2 percent for underexploited stocks [...], while that of stocks exploited at the maximum sustainable level fell from 1974 to 1989, only to rise again to 59.6 percent in 2017.

[...] Establishing a link between catch trends and stock status is no easy task. Whereas an upward trend generally seems to indicate an improvement in stock status or an increase in fishing intensity, a downward trend is more likely to be associated with a decrease in <sup>abundance</sup><sup>1</sup>". We can therefore see that the situation is mixed, and that even if sustainable stocks have made progress, there is still work to be done in many areas.

Indeed, a 2016 report already showed that "31.4% of fish stocks were exploited at a biologically unsustainable level, i.e. overexploited [and that of all stocks assessed in 2013, 58.1% were fully exploited and 10.5% were under-exploited. At the same time, the percentage of stocks exploited at a biologically unsustainable level increased, particularly in the late seventies and eighties, rising from 10% in 1974 to 26% in 1989. Since 1990, the proportion of fish stocks exploited at an unsustainable level has continued to rise, albeit more slowly. The ten most productive species accounted for around 27% of global marine capture fisheries production in 2013. However, most of their stocks are fully exploited and offer no scope for increased production; the remainder are overexploited, so an increase in production will only be possible once stocks have been rebuilt".

1- <http://www.fao.org/3/ca9229fr/CA9229FR.pdf>

For its part, the non-governmental organization WWF, in the "Living Planet" report it publishes every two years in conjunction with the Zoological Society of London, took a closer look at the marine environment in 2015. It found that "the index encompassing all fish species consumed shows a 50% reduction in the size of their populations worldwide between 1970 and 2012", pointing out, among other things, that "many species of great importance to the fish market are particularly affected, such as Atlantic halibut, dab, cod, monkfish, common sole [North Sea sole] and turbot. And large predators, such as bluefin tuna and various species of shark and ray, are even on the brink of extinction". In 2019, the situation had not improved - since a study by 35 international researchers published in the American journal PNAS predicted that by 2100, 17% of marine animals could disappear if CO2 emissions continue at their current rate<sup>2</sup> .

Modern fishing techniques only make the situation worse. Bottom trawling, for example, using huge nets weighted down with heavy weights and equipped with metal wheels, scrapes the seabed, destroying everything in its path. This savage method is accompanied by the massive discarding of at least 4% of the catch - the bycatch - an estimate provided by a recent <sup>WWF3</sup> report.

---

2 - <https://www.linfordurable.fr/environnement/au-rythme-actuel-du-rechauffement-17-danimaux-marins-en-moins-dici-2100-11719>

3 - <https://www.un.org/africarenewal/fr/magazine/mai-juillet-2017/les-oc%C3%A9ans-sous-la-menace-des-plastiques#:~:text=Les%20oc%C3%A9ans%20sont%20submerg%C3%A9s%20par,que%205%25%20des%20d%C3%A9chets%20plastiques.>

Another scourge, so-called "ghost nets" - abandoned or accidentally lost fishing gear - are a major cause of mortality, particularly among birds (around 1 million a year) and marine mammals, mainly seals and whales, but also turtles and <sup>sharks</sup><sup>4</sup>.

The devastation wrought by overfishing is beginning to raise real awareness at international level. For example, the European Commission, faced with the truly worrying state of stocks in the Mediterranean Sea (where 80% of fish stocks are considered overexploited), obtained in March 2017 the commitment of eight member states (Spain, France, Italy, Malta, Slovenia, Croatia, Greece, Cyprus) and seven non-member countries (Morocco, Algeria, Tunisia, Egypt, Turkey, Albania, Montenegro), to implement a series of measures (scientific data collection, multi-year fisheries management plan, fight against illegal fishing...) aimed at "saving", as the official press release puts it, "fisheries resources in the Mediterranean".

It's a fact that bottom-destroying fishing is currently threatening our marine biodiversity. What about aquaculture? Is it a viable solution for limiting overfishing and its devastating effects?

---

4- <https://www.f.be/fr/actualites/letre-humain-ingere-5-grammes-de-plastique-par-semaine-soit-the-equivalent-of-a-credit-card/>



## Fishing or aquaculture: what are the effects?

It's true that a significant proportion of fish production now comes from aquaculture. In 2014, this sector became the largest supplier of fish for human consumption, overtaking fishing for the first time. Even today, WWF points out on its website that "almost half of the seafood we consume comes from aquaculture". And even though fishing tonnages still exceeded those of aquaculture (93.4 million tonnes versus 73.8 million tonnes), it is to aquaculture that we owe the impressive growth in the supply of fish for human consumption. While it represented just 7% of supply in 1974, its proportion had already risen to 26% in 1994 and 47% in 2016<sup>5</sup>.

But while aquaculture appears to be a viable alternative to overfishing, and thus a means of limiting its disastrous effects on the environment, it is also a major source of pollution, whether organic, chemical, bacteriological or even genetic... These pollutant flows can be significant both locally and worldwide. It is estimated that the production of one tonne of salmon involves 1 km<sup>2</sup> of sea and contributes to the discharge of 8% of nitrogen and 14% of phosphorus in certain regions of the world, notably in the North<sup>Sea</sup><sup>6</sup>...

---

5- Lenfest Forage Fish Task Force, "Little fish, big impact - Managing a crucial link in ocean food webs", 2012.

96 [https://www6.inrae.fr/productions-animales\\_eng/content/download/4440/442511/version/1/file/Prod\\_Anim\\_1991\\_4\\_1\\_08.pdf](https://www6.inrae.fr/productions-animales_eng/content/download/4440/442511/version/1/file/Prod_Anim_1991_4_1_08.pdf)

It also contributes to water pollution: "Aquaculture has been widely criticized for using antibiotics, discharging residues and exceeding carrying capacity: the aquatic environment has a self-purification capacity which, when exceeded, leads to very high mortality rates and degrades marine ecosystems," explains Lionel Dabbadie, an aquaculture researcher at CIRAD. In intensive fish farming, huge quantities of organic waste (faecal matter) and toxic wastewater are released into the natural environment around the sites. Some salmon farms discharge as much faeces every day as the population of an average city of 600,000! As a result, the chemical composition of the water changes, leading to rapid and untimely growth of algae, which is lethal to certain marine animals and potentially dangerous to humans through the consumption of contaminated shellfish. And let's not forget that the intensive use of antibiotics and vaccines to prevent the spread of disease in an environment where fish populations reach phenomenal concentrations has direct repercussions on the health of local wild species, which are not genetically armed to resist the pandemics that spread from fish farms.

In addition, a large proportion of so-called "forage fish" (small to medium-sized fish species such as anchovies, herring, menhaden and sardines, which are at the lower end of the food scale) is eaten as part of the diet.

now used to feed fish in captivity. An April 2012 scientific report, entitled "Little Fish, Big Impact"<sup>7</sup> and funded by the Lenfest Ocean Program, a private foundation dedicated to ocean conservation, shows that feed accounts for over a third of the world's marine fisheries, and has led to the collapse of some of their populations. Yet between 80% and 90% of these catches are used for purposes other than direct human food consumption. In his book *De la pêche à l'aquaculture - Demain, quels poissons dans nos assiettes?*, Fabrice Téletchéa, researcher at the Animal and Functionality of Animal Products research unit at the University of Lorraine, shows that over the last four decades (1970-2010) "an average of 23.3 million tonnes per year" of forage fish have been processed for use as feed in aquaculture, but also for land animals (poultry, pigs) and pets (dogs, cats).

Indirectly, therefore, aquaculture contributes significantly to the pressure on wild fish stocks: it is far from playing the role of substitute for fishing that is generally attributed to it<sup>5</sup>. To feed fish raised in aquaculture in a sustainable and morally responsible way, the development of the use of insect meal could be a solution. This is what the European Union has been promoting since July 1, 2018. A 2017 report by the NGO Bloom<sup>8</sup> denounces the fact that 57% of the

---

7 - Lenfest Forage Fish Task Force, "Little fish, big impact - Managing a crucial link in ocean food webs", 2012.

98 8 - Bloom, dossier d'alerte "De la confiture aux cochons, l'envers du décor de l'aquaculture", 14/02/2017.

The world's fishmeal production supplies the aquaculture sector, whereas insect larvae meal, which would not jeopardize our food safety, could replace it. For this reason, it is important for every consumer to be aware that, although aquaculture is an interesting source of fish protein, not all its production methods are yet sustainable. That's why the WFF recommends moderating fish consumption, whatever the farming method, giving preference to herbivorous fish species and buying ASC (Aquaculture Stewardship Council) or Agriculture Biologique (Organic Farming) certified fish, to be sure that the seafood consumed has the most eco-responsible origin possible.

Ultimately, we each have a role to play, and the key to change really does lie in our hands as buyers, since if demand for sustainably caught fish increases significantly all the supermarkets will follow suit, and, in turn, so will fishing and production methods. Unfortunately, it's not only overfishing and overconsumption of fish that are taking their toll on our oceans.

## Plastic pollution, between the formation of a seventh continent and various impacts

The issue of plastic waste has also become a matter of urgency with the arrival of plastics that cannot be biodegraded by micro-organisms, essentially polyethylene, polypropylene and PET, which today make up 90% of marine waste. The recent discovery of so-called "big dustbins" of marine waste at the center of the main oceans has raised the spectre of a "7th continent", especially as the volume of plastic waste ending up in the oceans is estimated at around 30 million tonnes a year.

The millions of pieces of plastic littering our oceans - of which only 5% are visible on the surface of the water - are not only accumulating on the seabed and threatening its fragile balance: 99% of seabirds will have ingested plastic by 2050 if nothing changes, and plastic will be more prevalent than fish in the oceans<sup>9</sup>. WWF also points out that, as a result of this ever-increasing pollution of our maritime spaces, we ourselves ingest around 5g of plastic a week, equivalent to the weight of a credit card, given that even the water in our bottles and from the tap contains traces of it<sup>10</sup>.

According to Jessica Nibelle, spokesperson for WWF-Belgium, "these results should serve as a wake-up call

---

9 - WWF press release 07/06/2019.

10 - <https://wwf.be/fr/actualites/letre-humain-ingere-5-grammes-de-plastique-par-semaine-be-the-equivalent-of-a-credit-card/>

to governments. Plastics pollute not only our oceans and waterways, but also marine life and the human body. Global action is urgent and essential to tackle this crisis. It's hard to argue with her when the United Nations Environment Programme estimates that the impact of plastic pollution on the oceans costs \$8 billion a year.

It is therefore imperative that we all do our part to reduce the presence of plastic in the oceans, by avoiding its use as much as possible, and by taking part in litter-picking sessions on beaches, or doing so whenever the opportunity arises. We therefore invite you to apply the advice given by WWF to everyone to take action at their own level, actions that are practical and economical as well as eco-respectful:

- "Ditch the plastic bottles in favor of a reusable water bottle.
- In restaurants, ask for your drink without a plastic straw. If an establishment receives a lot of comments about the use of plastic straws, it will probably look for an alternative such as cardboard, bamboo or stainless steel straws.
- Use a reusable shopping bag and always carry one with you.
- While we're on the subject of shopping, opt for cardboard packaging and bulk products.
- Bring your own container when you

order to go. Whether it's your coffee or your meal, most retailers will be happy to serve you in your own container.

- Choose solid soaps.
- Stop using cling film to cover your food. There are alternatives to cling film, such as bee wraps (made from beeswax or vegetable wax)."

### Lower oxygen levels in the oceans

At the same time, according to National Geographic, oxygen levels in the oceans are falling. While observing blue marlin fishing as part of a study, Eric Prince, a garfish specialist with the U.S. National Oceanic and Atmospheric Administration, realized that the species was forced to dive to depths of 80 m to hunt, whereas it rarely ventures more than 30 m below sea level. With global warming and ocean acidification, oxygen levels in the water are dropping drastically: warmer waters naturally contain less oxygen, prompting marine creatures to consume more, and creating a vicious circle that endangers underwater life as a whole. Oxygen-depleted zones are expanding by 1 m every year all over the world, and scientists have calculated that these losses are equivalent to 2% of their total surface area.

oxygen in the last 50 years. This rate is all the more alarming given that we now have four times as many marine areas completely deprived of oxygen, and 500 coastal sites with extremely low oxygen <sup>levels</sup><sup>11</sup> .

It goes without saying that such upheaval in our marine ecosystems has and will have catastrophic consequences for all species of marine flora and fauna, in terms of their diet, behavior and life expectancy. Many fish species, such as sharks, tuna, mackerel and herring, for example, move in smaller schools and closer to the surface in oxygen-rich waters. A study published on September 7, 2019 by the International Union for Conservation of Nature (IUCN), tracking the work of 67 experts, predicts a further 3-4% loss of ocean oxygen stocks by 2100 if greenhouse gas emissions and other sources of pollution continue to grow at current <sup>rates</sup><sup>12</sup> . Species that are particularly sensitive to low oxygen levels due to their large size and high energy requirements (such as sharks) are likely to be even more threatened. The increased need for oxygen will drive them ever closer to the surface, into areas that are still rich in oxygen but more exposed to (over)fishing. Crustaceans and all species that cannot change their geographical location to reach the most oxygenated areas are even more threatened with extinction.

---

11- <https://www.nationalgeographic.fr/environnement/loxygene-disparait-progressive-ment-des-oceans>

12- <https://www.lefigaro.fr/sciences/deja-menaces-les-oceans-en-manque-d-oxygene-20191207>



In all, 60% of our fish will be endangered by this dramatic situation by 2100. Only a handful of species, such as jellyfish, are adapting their metabolism and behavior to evolve in this increasingly hostile environment, and are therefore less threatened, as are squid and microbes, which are more tolerant of hypoxia (lack of oxygen). We can deduce from this that fish and other species highly sensitive to oxygen shortages will proliferate much less than squid in the years to come: consumption of the latter will therefore be much more eco-responsible. It's important to bear this in mind when choosing which marine species to consume, so as not to overwhelm those species that are increasingly in difficulty.

*"You can only triumph over nature by obeying it.*

Francis Bacon

Which fish to choose?

With 86 million tonnes of fish caught every year and around 23,500 species listed, there's plenty of choice for the consumer. But at what price?

Each and every one of us, and in particular every restaurateur, must now assume our responsibilities by asking ourselves the following questions

the right questions, because compliance with certain criteria is now essential for the good of our seas and oceans:

- Is the species of fish I serve endangered?
- Is the stock sufficient to ensure the renewal of the species?
- Does the fish offered respect the legal size for fishing? Is it too young or too old to be eaten without reproducing the species? (It's very important not to eat fish that haven't reached adult size, to give the species time to reproduce).
- What type of fishing was used? Industrial methods, which are harmful to the environment, or artisanal methods that guarantee respect for habitats? (Dredging, for example, is a controversial technique that damages the seabed, and is used more in countries with more liberal legislation, such as Mauritania).
- For aquaculture, does the fish on the menu come from a non-certified farm, or does it come from a farm certified as environmentally friendly by a label: organic, Label Rouge, ASC (Aquaculture Stewardship Council), etc.?
- Will this fish affect my health? (Some species are much more loaded than others with metals, such as mercury, which affects human brain function and development, industrial chemicals [PCBs, dioxins] or pesticides [DDT]).

Stopping serving fish is not a solution, but buying less of it and making the right choices is a perfectly realistic option. By wisely choosing the species we put on our customers' plates, we can help them enjoy the benefits of fish without exposing them to health hazards, or exacerbating the ecological problems associated with its consumption. In this sense, buying certified seafood products, checking that the fish we buy have reached adult size, checking the labels for the fishing technique used (and also for freezing, where applicable) and diversifying our consumption choices as much as possible in an informed way to spread the pressure on marine resources are all ways of tipping the balance in the other direction, that of preserving marine life<sup>13</sup>. Based on the criteria set out above, and of course respecting the seasonal nature of catches, we can classify fish into three main categories: seafood products whose consumption poses no problem, seafood products to be consumed in moderation, and seafood products not to be bought.

But before we look at these lists, it's worth recalling the techniques for recognizing fresh shellfish at the time of purchase. In the case of fish, the first thing to look for is its smell: is it fresh and iodized, or more or less malodorous? Shiny skin, a clear, bulging eye, firm, elastic flesh and red/pink gills that don't give off a strong odour.

---

13 - <https://www.wwf.fr/champs-daction/ocean/peche-aquaculture>

106 14 - [www.mrgoodfish.com](http://www.mrgoodfish.com): "How do you know if a seafood product is fresh?"

odors are also indicators of <sup>freshness</sup><sup>14</sup> . Beware of ice-covered fish with only the head sticking out: this is not a reliable indicator of freshness! If you want to buy fillets (of sole, plaice, etc.), be aware that yellowed flesh means rotting flesh, and should therefore be <sup>avoided</sup><sup>15</sup> . As for the rest of the seafood, the pungent smell should be avoided in favor of the scent of sea air. Shellfish should open and close if bought live. The same principle applies to gastropods, except that in this case you need to check whether the animal emerges and moves outside its shell, like a snail. On the other hand, while it's essential that crustacean shells are well closed at the time of purchase, we don't recommend eating crustaceans whose shells are still closed after cooking. The liveliness of shellfish can be measured by the reflexes of the eyes, antennae and legs.

Before moving on to the classification of different marine species, let's remember that organic fish and wild fish are two different statuses: organic fish is the product of quality aquaculture. Contrary to popular belief, wild fish is not necessarily healthy or organic; it may, for example, have a high level of chemical pollution. Without a label, it's difficult, if not impossible, to know whether the fish is safe to eat, because even if the origin of the fish is specified, it's impossible to confirm whether or not the areas concerned are subject to pollution. Certified organic fish comes from a high-quality farm, recognized as such thanks to

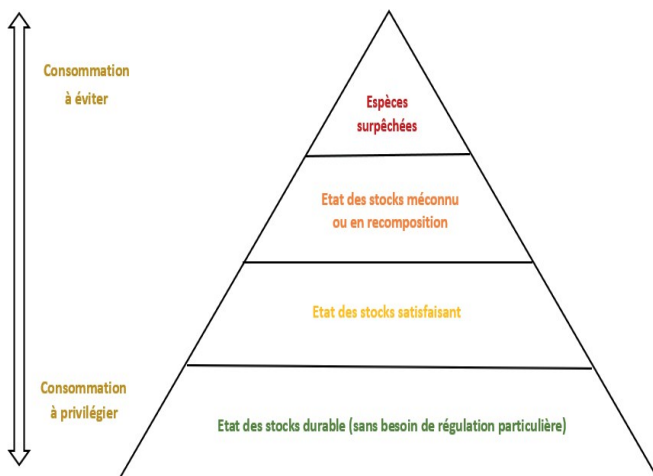
---

15 - [www.consoglobe.com](http://www.consoglobe.com): "What species of fish should I buy?"

to different criteria:

- ecological criteria: guaranteeing respect for the environment and animals;
- the food criterion: the guarantee of a diet without any substances of terrestrial animal origin and without GMOs (the animal is fed fishmeal from managed fisheries whose quality is controlled and certified, organic plants, vitamins and minerals); the addition of growth stimulants, medicinal additives, synthetic chemical colorants or any synthetic hormone to food is strictly forbidden;
- the criterion of animal welfare: organic fish need more space in their tanks, which must ensure their comfort, unlike the overcrowded cages used by conventional fish.

In the three tables below, we classify the various marine species according to the three categories mentioned: to eat, to limit and to avoid. Like the tables in the chapter on meat, their aim is to enable everyone to buy fish responsibly, by making the right choices from a very wide and sometimes irresponsible offer. To help you understand the division we propose between these three categories, please note that all our sources come from certified organizations and that our classification criteria are based on the following scale:



**TABLE OF FISH, SHELLFISH AND OTHER SEAFOOD THAT CAN BE EATEN WITHOUT PROBLEMS**

Name of fish / shellfish	<ul style="list-style-type: none"> <li>- Origin(s)</li> <li>- Inventory status</li> <li>- Existing ecoresponsible sourcing</li> <li>- Country legislation</li> </ul>	<ul style="list-style-type: none"> <li>- Minimum size to consume and preserve the species</li> <li>- Seasonality</li> <li>- Recommended and inadvisable fishing techniques</li> <li>- Organic labels and certifications</li> </ul>	<ul style="list-style-type: none"> <li>- Observed pollution rate</li> <li>- Nutritional intake</li> <li>- Potential alternative to which species?</li> </ul>
Green / brown / red algae	<p>Strong development potential for the macro-algae sector:</p> <p>Exports mainly to Europe and imports of around 130,000 tonnes from Chile, the Philippines and Tanzania.</p> <p>24 species authorized for consumption in France</p>	<p>Supply of AB eco-certified algae, guaranteeing sustainable practices and good water quality.</p>	<p>Spirulina: protein and iron. Sea lettuce: iron, calcium and vitamin C Chlorella: eliminates heavy metals. Klamath: anti-inflammatory and antioxidant.</p> <p>Sea beans: minerals and antioxidants. Kombu (royal / Breton): minerals, fights cholesterol / harvested in spring and summer Wakame: vitamins A, B and C, and proteins / spring and summer harvesting</p> <p>Dulse: vitamin C / harvested in spring and autumn Nori: protein and calcium / harvested in spring and autumn</p>
Whelk (busycotypus canaliculatus species)	<p>Sustainable stocks in Normandy (bulot de granville)</p> <p>Heavily overfished stock: West Atlantic coast in the Gulf of Maine, USA</p>	<p>40-45 mm</p> <p>Granville whelk has been awarded the "Granville Bay" and "MSC Sustainable Fishing" eco-labels</p>	<p>Low in calories and nutritionally interesting</p> <p>Quality whelk: odorless and smooth to the touch</p>
Squid	<p>Satisfactory stocks: Southwest Atlantic, Southeast Pacific</p>	<p>11 cm</p> <p>Favour jig fishing and avoid pelagic or bottom trawling.</p>	<p>Source of nutrients (vitamin B12, Omega-3) but cholesterol</p> <p>Quality squid: thickest, translucent, firm flesh with lightly pearly tentacles</p>
Coque commune	<p>Species not subject to regulation (sustainable stock)</p>	<p>2.7 cm</p>	<p>Firm, fleshy flesh with an iodized, vitamin-rich taste</p>
King crab	<p>Illegal fishing in Russia (the main fishing country, along with Norway)</p> <p>Imported into Europe mainly as unshelled claws</p>	<p>130 mm</p> <p>Barents Sea fishery, MSC-certified, stocks available, no overfishing</p>	<p>Can reach 10 kg and measure 1,5 m</p>

Caramote shrimp		12 cm Avoid buying them from June to October (egg-bearing season).	Firm, low-calorie, high-protein flesh; easy to decorate
Northern shrimp	Satisfactory stock : Skagerrak / Kattegat, Northeast Arctic, Norwegian Sea and Canadian Northeast Pacific  Prohibited discharges in Iceland and the Western Arctic  Overfished stock: Northeast Atlantic (Iceland, North Sea and Greenland)	16 cm	Contains Q10 co-enzyme, high omega-3 content, rich in vitamin B12, vitamin B3, phosphorus and niacin.
Tropical shrimp /Gamba	Rapid reproduction but global overexploitation Only safe biological limits: Australia  Intensive aquaculture in Southeast Asia and Latin America: focus on organic and "zero input" farming (no chemicals, fertilizers or medicines; less polluting).  Madagascar shrimp certified "Agriculture Biologique" according to European specifications	Even if there is a growing supply of AB-certified shrimp, ask the supplier about production conditions.  Favoring eco-responsible shrimp farms to avoid destroying mangroves  7 MSC-certified Madagascar shrimp fisheries (and 1 in Surinam, 1 in France), 1 in French Guiana, 1 in Chile, 1 in the Pacific for several varieties, 3 in the Indian Ocean and 4 in Australia)	More popular than North Sea shrimp because of low price  Shrimp is a virtually fat-free food and is recommended for people who want to lose weight.  It is an excellent source of selenium, phosphorus and B vitamins.
Sea bream and sea bream Do- gray roadstead  Pink sea bream Sea bream	Stock of wild sea bream under threat	20 to 40 cm  Avoid fishing with open nets or trawls, preferring longlines or bottom-set nets.  Buy certified organic	Rich in phosphorus, calcium and iron  Risk of mercury contamination
Strangle	Species not subject to regulation as sustainable stock	4.5 cm	Fine flesh Season: August to March
Grondin (red, perlon and gray)	Overfished gurnard stock: Northeast Atlantic	> 25 cm	Grey and perlon: delicate flesh  Red gurnard: less meaty; can be used to make soups





Herring	<p>Sustainable stock: Northeast Atlantic (over 2 million tonnes of catches / year)</p> <p>Overfishing in the 1970s; resources rebuilt in some areas</p> <p>Satisfactory stock: North Sea, Baltic Sea, Gulf of Bothnia and Riga</p> <p>Overfished stocks: Iceland, West Baltic and Northeast Atlantic</p>	<p>16-17 cm</p> <p>16 MSC eco-labelled herring fisheries (in the UK, Canada, the Faroe Islands, Ireland, Denmark, Norway, Sweden, the Netherlands and France - FROM Nord)</p>	<p>Rich in phosphorus, selenium, potassium, vitamins B6, B12, D; omega-3</p> <p>Chair white, fatty and very tasty; does not tolerate overcooking or poaching</p>
European and North American lobster	<p>North American lobster production 20 times greater than European lobster production</p> <p>Durable inventories: Eu-rope</p> <p>U.S. stock satisfactory: focus on Canadian, Gulf of Maine and St. George Bank lobsters</p>	<p>Lobster North European: 80 mm</p> <p>Canadian lobster: 82 mm</p> <p>European lobster: 95 mm</p> <p>7 MSC-certified fisheries worldwide (6 American lobster and 1 co-managed by Norway and Jersey)</p>	<p>Avoid the egg-bearing female</p>
Hollow oyster	<p>Prefer AB-certified production as local as possible: Japan, Korea, Siberia, Australia, United States, Canada and Europe</p>	<p>Prefer hand-picking, a highly selective fishing method</p> <p>MSC-certified wild oyster fisheries (2 in the Netherlands, 1 in Japan and 1 in the USA)</p>	<p>Negligible catch and release rates; minimal impact on benthic habitats</p>
Spiny lobster	<p>Durable stock</p> <p>Mainly west coast of Scotland</p> <p>Overfished stock: southern Gulf of Gascony (many by-catches)</p>	<p>Female sexually mature: 7.5 cm</p> <p>Male sexual maturity: 8.5 cm</p> <p>Prefer 10 to 20 cm</p> <p>Consumption in moderation, except for creel fishing</p> <p>1 Danish-Swedish MSC-certified fishery</p>	<p>Although lean, its flesh contains essential omega-3s EPA and DHA.</p>
Saithe black hake black hake-fine black hake pollack	<p>Satisfactory stock but species highly sensitive to overfishing</p> <p>Replenishing stock: Iceland (increasing biomass) and Western Scotland</p> <p>Overfished stock: Féring-ien</p>	<p>35 cm in European waters</p> <p>60 cm or over 2.3 kg for a gutted fish</p> <p>Year-round consumption</p> <p>15 MSC eco-labelled saithe fisheries in the Northeast Atlantic, including 3 in France: Euronor, la Compagnie</p>	<p>Eco-responsible alternative to cabillaud</p> <p>Neutral taste and few bones</p> <p>May contain traces of toxic substances such as mercury</p>

Dab sole commune	Sustainable stock: North Sea and English Channel (stable bio-mass since the 1980s)	10-20 cm for males 20-25 cm for females	Protein-rich lean meat (16 g per 100 g of fish), phosphorus and vitamins B6
Maquereau	Not very vulnerable to fishing pressure (satisfactory stock), but no information on management frameworks for ecosystem conservation in observed areas	30 cm (minimum breeding size) Moderate by-catch and discard rates: impact on seabed negligible	Rich, semi-fat pelagic fish in omega-3
Moule	Improving breeding conditions in Europe  Worldwide, management measures must be taken to limit dredging and promote the sustainable exploitation of spat.	6 cm  Prefer breeding on wooden poles or ropes: avoids mixing invasive species and propagating harmful parasites.  Avoid dredging, which damages the seabed. In favor of AB / CSA certified farmed mussels	No feed supply required: mussels filter their food from the water
Mullet / muges	Species not subject to regulation (sustainable stock)	Golden mullet: 21 cm Hog mullet: 30 cm Lippy mullet: 35 cm	Alternative at the bar
Clam	Species not subject to regulations Sustainable stock	Between 3.5 and 4 cm  Hand-fished in the Northeast Atlantic and through aquaculture in Europe and North Africa	They can be eaten raw or cooked.
Pangasius (sieur)	Pangasius produced in Vietnam certified gLOB-AL g.A.P.	Farming conditions rarely sustainable: ASC or organic certified purchasing	Alternative to overexploited species
Nile Perch	Stock in reconstitution: Lake Victoria	60 cm to 2 m	Fillets with firm, white flesh; important source of protein
Saint Pierre	Satisfactory inventories, but Caution: increased catches for several years and lack of fishing management measures	37 cm (600 g): minimum breeding size	Numerous call-outs: "Soleil" in Dunkerque, "Jean-Doré" in Boulogne-sur-Mer, "iar vör" in Brittany, "poule" in Concarneau, "pink" in Arcachon, "gail" in Roussillon and "San Pedro" in Nice  Noble" species: rarity, high price and great finesse

Pea-son-rabbit	Satisfactory stocks: Prized neither in restaurants nor in local cuisine, only fishermen and shore dwellers eat it.	12-14 cm	Alternative eco-manager wit h grouper
Tacaud	Stock status: undocumented, not subject to catch quota or minimum market size  No conservation regulations in Europe	Favoring bottom longline fishing  Avoid demersal otter trawling or Danish seining	Little known to consumers Fine, fragile flesh with high nutritional quality  Eco-alternative responsible for white fish
Tassergal	Species not subject to regulation (sustainable stock)	39 cm  Fishing from August	Lean blue-grey flesh, rich in vitamin B12 and selenium
White albacore tuna	Durable stock  Overfished albacore stock: Mediterranean and Pacific	97 cm  Avoid albacore tuna caught under FADs  11 MSC-certified germon tuna fisheries (10 in the Pacific and 1 Spanish in the Northeast Atlantic)	Eco-responsible alternative to other tuna species
Skipjack tuna Skipjack tuna	Most-fished variety of tuna: present in many areas and reproducing as- sez quickly.  Satisfactory stocks, moderately used	Avoid stocks fished under FADs  7 MSC-certified skipjack tuna fisheries (1 in the Indian Ocean and 6 in the Pacific)	Stock management by regional fisheries management organizations (RFMOs), but no control ac- tivities or measures to pro- tect against overfishing
Pea-son-rabbit	Satisfactory stocks: Prized neither in restaurants nor in local cuisine, only fishermen and shore dwellers eat it.	12-14 cm	Alternative eco-manager wit h grouper
Tacaud	Stock status: undocumented, not subject to catch quota or minimum market size  No conservation regulations in Europe	Favoring bottom longline fishing  Avoid demersal otter trawling or Danish seining	Little known to consumers Fine, fragile flesh with high nutritional quality  Eco-alternative responsible for white fish
Tassergal	Species not subject to regulation (sustainable stock)	39 cm  Fishing from August	Lean blue-grey flesh, rich in vitamin B12 and selenium

White albacore tuna	<p>Durable stock</p> <p>Overfished albacore stock: Mediterranean and Pacific</p>	<p>97 cm</p> <p>Avoid albacore tuna caught under FADs</p> <p>11 MSC-certified germon tuna fisheries (10 in the Pacific and 1 Spanish in the Northeast Atlantic)</p>	<p>Eco-responsible alternative to other tuna species</p>
Skipjack tuna Skipjack tuna	<p>Most-fished variety of tuna: present in many areas and reproducing as- sez quickly.</p> <p>Satisfactory stocks, moderately used</p>	<p>Avoid stocks fished under FADs</p> <p>7 MSC-certified skipjack tuna fisheries (1 in the Indian Ocean and 6 in the Pacific)</p>	<p>Stock management by regional fisheries management organizations (RFMOs), but no control ac- tivities or measures to protect against overfishing</p>
Tilapia	<p>Introduced on the European market since The 2000s</p>	<p>AB supply of tilapia developed</p> <p>41 ASC-certified farms worldwide (25 in Asia-Pacific and 16 in Latin America)</p>	
Tourteau	<p>Unrecognized and insecure stock depending on the zone</p> <p>Satisfactory stock : France</p> <p>Overfished stocks: United Kingdom, Scotland, Norway and eastern waters</p> <p>Management of this fishery is rather weak in almost all areas, except in Ireland, where it is quite effective.</p>	<p>Female sexually mature : 14 cm (3-4 years)</p>	<p>Norway and the East of the UK are fighting for better fishing conditions and better rejection, mainly of crabs that are too small.</p>
Trout	<p>In the wild, satisfactory stock</p> <p>Farmed for over a century and intensively produc- ted in several European countries (mainly rainbow and fario trout)</p> <p>In Northern Europe and Turkey, strict ex- igences in the context of livestock farming, thus limited im- pact on the environ- ment.</p> <p>In Southern Europe: management varies from country to country and is not always strictly applied</p>	<p>Marketing 200 to 300 g</p> <p>350 g : 1 year</p> <p>Mainly targeted by recreational fishing</p> <p>Supply of organically farmed trout, of which France is the world's 1st AB-certified producer.</p> <p>80 ASC-certified breeding f a r m s (Norway, Germany, Chile, D e n m a r k , Greece, Iceland, Italy, Peru, Turkey, S p a i n , Japan and France)</p> <p>E f f e c t i v e certifications, such as "Glob- al gAP", "Friend of the Sea" and "are currently being developed</p>	<p>Eco-alternative to sau- mon and other farmed fish of more distant origins.</p>

TABLE OF FISH, SHELLFISH AND OTHER SEAFOOD TO LIMIT ACCORDING TO ORIGIN			
Name of fish / shellfish	Provenance(s) - Inventory - Country legislation - Existing ecoresponsible sourcing	Minimum size to consume while preserving the species - Seasonality - Recommended and discouraged fishing techniques - Organic labels and certifications	Observed pollution rate - Nutritional benefits - Potential alternative to which species?
Anchovies	<p>Represents at least 15% of the annual global catch: total volume of catches allowed (biomass due to the short lifespan of this species)</p> <p>Sustainable stock: Bay of Biscay and Western Portugal</p> <p>Insufficient stocks: Mediterranean and Atlantic</p>	<p>Mediterranean: 9 cm</p> <p>Atlantic: 12 cm</p> <p>Spring and summer consumption periods</p>	<p>Food base for many carnivorous fish, such as tuna and shark, and for certain birds</p> <p>Very healthy and little polluted / affected by mercury</p> <p>Oily fish: source of vitamins and omega-3s</p> <p>Perishable fish, rarely fresh on the shelves, more likely to be processed.</p>
Spider crab	<p>Unrecognized stock</p> <p>Sustainable stock: Brittany, Channel and North Sea</p> <p>Additional measures to protect the species worldwide</p>	<p>12 cm / Avoid capture with fixed nets (blocking of sharks, rays, porpoises... in the wires)</p> <p>Prefer capture by creel (= cage placed on the seabed where capture occurs passively, without the intervention of the fisherman: the prey, generally attracted by bait, enters the cage and remains there incorporated).</p>	<p>Fine, low-fat flesh with strong iodine flavour</p>
Sea bass / wolf	<p>Satisfactory stock : South (Bay of Biscay)</p> <p>Overfished stock: Northwest Atlantic, (Celtic Sea, English Channel, Irish Sea and North Sea)</p> <p>Little-known stock: West of Scotland and Iberian coasts</p> <p>Unregulated fishing: Eastern Central Atlantic and Mediterranean</p> <p>But cha- lut fishing prohibited in the EU during the spawning period on spawning grounds</p>	<p>North Sea, Celtic Sea, English Channel and Irish Sea : 42 cm</p> <p>Bay of Biscay and Iberian waters: 38 cm</p> <p>Sea Mediterranean: 25 cm</p> <p>Fishable and edible all year r o u n d</p> <p>Avoid trawling</p> <p>France: recreational fishing limited to 2 sea bass per person per day in 2020</p> <p>Focus on organically-raised bass</p>	<p>Food base for many carnivorous fish, such as tuna and shark, and for certain birds</p> <p>Very healthy and little polluted / affected by mercury</p> <p>Oily fish: source of vitamins and omega-3s</p> <p>Perishable fish, rarely fresh on the shelves, more likely to be processed.</p>

Cod / cod	<p>World's most eaten fish species: victim of overfishing</p> <p>Sustainable stock: Iceland, Northeast Arctic seas</p> <p>Overfished stock: Pacific, Atlantic, Irish Sea, Western Scotland, Western Baltic Sea, Northeast Arctic, Northeast Antarctic, Norway, Eastern Channel, Faroe Islands, Western Celtic Sea</p>	<p>Professional anglers: 35 cm Recreational anglers: 42 cm Prefer 42 cm</p> <p>Avoid bottom trawling. Prefer pelagic trawling.</p> <p>16 MSC-certified fisheries (Iceland, Faroe Islands, Norway, Denmark, UK, Spain, France, Russia and Canada)</p>	<p>Prefer cod backs as they are cut from fish weighing more than 2 kg.</p> <p>Avoid 100- 200g fillets cut from cod called "Codfish" that have not reproduced</p> <p>Lean fish rich in complete protein, including 9 essential amino acids</p> <p>No signated pollution, although may contain traces of mercury</p>
Carrelet / plaice	<p>Long-lasting stocks: European waters, especially in the North Seas (East + West Channel),</p> <p>North Sea, Celtic Sea and Irish Sea)</p> <p>Stock globally overfished</p>	<p>Baltic Sea: 25 cm Elsewhere: 27 cm</p> <p>Avoid consumption during the breeding season: flesh less firm and less edible quantity.</p> <p>8 MSC-certified fisheries (Denmark, Scotland, Iceland and the UK)</p>	<p>Source of protein, vitamin B6 and omega-3 with low fat content</p> <p>Carrelet / quality pile: shiny, firm and elastic, glossy and slimy appearance, the red dots on the fins as visible as those on the back.</p> <p>Tendency to store pollutants, especially heavy metals</p>
Farmed caviar (Esturgeon)	<p>Caviar marketed in the EU marked by a label with a code for species, country of origin/packaging, batch, etc. + a letter ("W" for "Caviar"). "Wild" and "C" for "Captive")</p>	<p>Favoring caviar from green ethical farms</p>	<p>Rich in omega-3 and vitamin D</p>
Alaskan bobwhite	<p>Overfished stock: Russia Sea of Okhotsk and Western Bering Sea</p>	<p>3 MSC-labeled hake fisheries: the Bering Sea/Aleutian Islands fishery, the Gulf of Alaska fishery and the Russian Sea of Okhotsk fishery.</p> <p>(Western Pacific)</p>	<p>Flaky flesh rich in omega-3s</p>
Congre	<p>Unrecognized stock</p>	<p>85-95 cm</p> <p>Prefer net or line fishing</p>	<p>Firm flesh</p>

Scallops	<p>Satisfactory stock : Manche and small deposits on the Atlantic coast under close surveillance</p>	<p>Most fishing is done by dredging the seabed: consume with moderation</p> <p>Prefer hand-farming or hand-fishing</p> <p>7 MSC-certified fisheries (Japan, China, Argentina, United States, Shetland and 2 in Canada)</p>	<p>Note: all pectinids can claim the name</p> <p>Check the nature of the product you are buying to ensure that it is not "scaloped" when transformed or frozen.</p>
Grey shrimp and bouquet	<p>Sustainable stock of pan-dalus borealis: North Atlantic</p> <p>Overfished stock: Skagerrak, Kattegat and Northern North Sea</p> <p>Overfished crangon shrimp</p>	<p>5.4 cm (whole)</p> <p>Prefer trap fishing. 11 MSC-certified northern shrimp fisheries (3 in Canada, 1 in Oregon, USA, 1 in Estonia, 1 in Greenland, 1 in Denmark, 1 in Sweden, 1 in the Faroe Islands and 2 in Norway)</p>	<p>Crunchy, iodized flesh, essential fatty acids, omega-3, astaxanthin and coenzyme Q10</p>
Haddock	<p>Sustainable stock throughout the North Atlantic</p> <p>Satisfactory stock: Irish Sea and Rockall</p> <p>Overfished stocks: North Sea, Iceland, Northeast Arctic, Celtic Sea, English Channel, and especially in Scotland and the Faroe Islands.</p>	<p>30 cm</p> <p>14 MSC-certified haddock fisheries (including the French fishing group Comapêche-Euronor) operating in the North Atlantic (Canadian waters, Barents Sea, North Sea, Icelandic waters and Norwegian waters)</p>	<p>Fish lean source of vitamin B1</p> <p>Quality haddock: white-pink flesh</p>
Swordfish	<p>Satisfactory stock: Indian Ocean, North Atlantic, Southeast Pacific and Northeast</p> <p>Overfished stock: Mediterranean and South-Atlantic, Leone, Belize, Honduras and Seychelles</p>	<p>14 MSC-certified spanish fisheries in the Atlantic and Pacific oceans</p>	<p>Concentration of heavy metals metal</p> <p>s above European standards in overfished areas</p>
Halibut	<p>Vulnerable to overexploitation : slow growth and late sexual maturity</p> <p>Satisfactory stock : Pacifique Nord-Est</p> <p>Endangered stock: white halibut (unless from MSC-certified Canadian fisheries)</p>	<p>65-80 cm</p> <p>Favoring stocks fished with bottom longlines</p> <p>5 MSC-certified fisheries in the North Atlantic</p>	<p>Lipid-rich Greenland halibut</p>



Hoki	<p>Durable stock: New Zealand and Australia</p> <p>Overfished stock: Argentina</p> <p>Stock at risk: Chile</p>	<p>&gt; 60 cm</p> <p>3 MSC-certified fisheries</p> <p>(New Zealand, Australia and Argentina)</p>	<p>Alternative to traditional North-East Atlantic species</p>
Langouste	<p>Threatened stock of red and pink lobsters: Atlantic coasts</p> <p>Restocking: Mediterranean, Australia and South Africa</p>	<p>11 cm (general regulations, which may vary according to variety and geographical area)</p> <p>Prefer trap fishing</p> <p>Avoid fishing with trawl nets and gillnets</p> <p>4 certified fisheries MSC (1 in Mexico, 1 in Australia, 1 in Bahamas and 1 on Tristan da Cunha Island)</p>	<p>Accumulation of mercury over time</p>
Yellow pollock	<p>Sustainable stock: Northeast Arctic and Norwegian Sea</p> <p>Satisfactory stock: North Sea, Iceland</p> <p>Caution: In Iceland, it is forbidden to throw fish back into the sea, but the quantity of fish still unable to spawn can reach a quarter of the fish caught.</p>	<p>40 to 50 cm</p> <p>Avoid slipping, purse seining and bottom trawling</p> <p>Prefer fishing with set nets and gillnets</p>	<p>Pink, pearly flesh that separates into petals, rich in protein, polyunsaturated fatty acids and omega-3s.</p>
Lotte / anglerfish	<p>Satisfactory stocks: Celtic Sea, Gulf of Gascoigne, Spain and Portugal (Northeast Atlantic).</p> <p>Overfished stock: Scotland and North Sea</p> <p>Heavily overfished stocks: China and Mediterranean</p>	<p>Males: 50 to 70 cm</p> <p>Females: 65 cm</p> <p>Favoring gillnetting: better stock management</p>	<p>Flesh and texture similar to veal</p>
Slim	<p>Unknown stock:</p> <p>Drink in moderation</p>	<p>30 cm officially, but prefer the size of sexual maturity: for males: 53 cm for females: 82 cm</p> <p>Refuse fish offered by non-professional fishermen and check the conditions under which famed meagre is produced.</p>	

Whiting	Satisfactory stock: Bay of Biscay and Iberian coasts	Avoid bottom trawling	Fish from very high taste quality
Hake	Sustainable stock: northern stocks of European hake and southern hake in New Zealand  Satisfactory stock : South Africa, Pacific and Northeast Atlantic  Stock at risk: Gulf of Lion, South-West Atlantic and East Pacific	> 60 cm if bought fresh > 1.4 kg eviscerated, either size 1 or 2  Avoid bottom trawling Prefer gillnet or longline fishing  Several MSC-certified fisheries (4 in Europe, 1 in the Northeast Pacific, 1 in New Zealand and 1 in South Africa)	Rich in protein, B vitamins, selenium, phosphorus
Lumpfish eggs	Unrecognized stock		Rich in protein, vitamin D, phosphorus and omega-3
Sea urchin	Satisfactory stock : France Regulated fishing prohibited during breeding season  Stock globally overfished	Atlantic: 4 cm Brittany: 4.5 cm Mediterranean: 5 cm  Avoid the reproduction period from April 15th to November 1st	Highly iodized flesh, rich in protein
Plaice	Species vulnerable to overfishing: slow growth and maximum life expectancy  Restocking: Celtic Sea	Avoid fishing perch chaulutes  Favoring denoise seine fishing	Consume in moderation due to the high accidental catch of undersized plaice.
Octopus	Stock durable: guinea-bissau  Satisfactory stock : Mauritania  Overfished stock: Morocco, Senegal, Gambia	To purchase: 750 g whole and 450 g gutted  Prefer (coat length) : Male sexually mature: 8 cm Female sexually mature: 12 to 13 cm  1 MSC-certified fishery in Asturias (Spain)	Tough flesh, must be cooked for a long time to soften

Rascasse	Unrecognized stock	12 cm	Fine, tasty, firm flesh
Red mullet (red mullet, red mullet, red mullet, Senegal red mullet)	<p>Sustainable stock: Indian Ocean and Senegal</p> <p>Satisfactory stock : Atlantic, North Sea, Northeast Channel, Corsica, Sardinia, Balearic Islands</p> <p>Overfished stock: Mediterranean (wild or farmed), North Sea and Gulf of Lion</p>	<p>Minimum re - production size: 17 cm</p> <p>Fishable and edible all year round</p>	<p>Noble fish: delicate, tasty flesh "Semi-fat with very fine bones</p> <p>May contain traces of pollution depending on origin</p> <p>Quality red mullet: rigid, tight skin and dark pupil. Sold whole and gutted, without head, scales or viscera.</p>
Black sword	<p>Highly vulnerable to overfishing: slow growth</p> <p>According to greenpeace, 80% of the species' stock has disappeared in 30 years</p> <p>Restocking: Europe (introduction of regulations)</p>	<p>70 cm</p> <p>Avoid bottom tackle fishing</p> <p>Avoid the silver scabbardfish lepidopus caudatus, a close relative of the black scabbardfish.</p>	<p>These fisheries are subject to TACs.</p>
Sardines	<p>Heavily overfished stock: European coast, Mediterranean (In the Mediterranean, 2nd most-fished species among small pelagic peas)</p> <p>Overfished stocks: Channel and Bay of Biscay</p> <p>Satisfactory stock : Atlantique</p> <p>Durable stock: Morocco</p>	<p>Atlantic (and throughout the EU): 11 cm Mediterranean: 12 cm</p> <p>Avoid spring in the Bay of Biscay and September to May in the Mediterranean (breeding season).</p> <p>4 MSC-certified fisheries (Great Britain, 2 in France and Mexico)</p>	<p>Very tasty fish, rich in unsaturated fatty acids</p> <p>Quality sardine: gills shiny and rigid, carmine red and moist, eye shiny and no blood stains on the gills; do not buy headless.</p>
Atlantic salmon	<p>Stocks down 75% in 20 years according to WWF</p> <p>Reproduction has disappeared from 15% of rivers: dependence on fresh water weakens the species</p>	<p>Prefer organic farming: raised in sea cages and fed organic feed, without drugs or colorants.</p> <p>100 MSC-labeled farms (Norway, Scotland, Poland, Faroe Islands, Ireland, Chile, Canada, Australia)</p>	<p>Ask your supplier for in- formation on aqua- culture practices</p> <p>Choose certified salmon "Bi-Ological Agriculture</p>

Cuttlefish	Overfished stock: Man-che	Minimum re-production size : 18 cm Eat in moderation: the impact of fishing on the Sepion stock (immature cuttlefish)	Short lifespan and high year-to-year variability in abundance
Sole	Sustainable stock: Bay of Biscay, English Channel, North Sea and Skagerrak-Kattegat Restocking: Ireland Little-known stock: Europe Overfished stock: West Africa	Minimum re-production size : 30 cm 3 MSC-certified fisheries certified fisheries (Denmark, Holland, French fishery FROM Nord)	Delicate flesh, distinctive but not very pronounced taste, boneless.
Surimi	Alaska Pollock stocks: satisfactory Hake stocks: threatened in the Gulf of Lion, South-West Atlantic and East Pacific Hoki stocks; overfished in Argentina, the Russian Sea of Okhotsk and the western Bering Sea, threatened in Chile	Some products come from MSC-certified fisheries, but most of the time the packaging does not mention the composition or origin of the product	Very low yield in relation to the quantity of raw material used Elimination of all soluble proteins during the manufacturing process
Tuna albacore	Stock at risk: Indian Ocean Overfished stock: Eastern Pacific and Atlantic Lack of catch limits, insufficient monitoring and inadequate controls. Sponsoring organizations unable to impose their regulations	Avoid purse seine fishing Prefer angling or hand fishing (traditional methods)	Uniform, slightly translucent red flesh Phosphorus, selenium, vitamins A, D and B, magnesium and iron

Turbot	Unrecognized wild stock	41 cm Give preference to farmed turbot and check production conditions before-buying	A rare fish with a delicate taste
--------	-------------------------	---	-----------------------------------



<i>Lompe</i>	<p><i>Unrecognized stock</i></p> <p>Variable vulnerability with low resilience (for example, very slow growth in Greenland, so avoid this stock)</p>	<p><b>70 cm maximum</b></p> <p>In some countries, fish flesh is discarded because it is not highly appreciated.</p>	<p>Exclusively prized for its eggs, which are used to make inexpensive caviar</p>
<i>Sturgeon eggs</i>	<p><i>On the endangered red list of IUCN</i></p> <p>Sturgeon egg fishing is very limited and regulated when it is not banned, but this does not prevent numerous illegal catches to circumvent the strict regulations.</p>	<p>Prefer farmed caviar after verification of production conditions</p>	
<i>Arctic char</i>	<p><i>On the IUCN Red List of Threatened Species in France</i></p> <p>Low inventory</p>	<p><b>13 to 75 cm</b></p> <p>Sea farming (Norway, United Kingdom, Ireland) and freshwater farming (France, Italy); consumed near production sites</p>	<p>White flesh</p> <p>Highly sensitive to pollution and environmental changes</p>
<i>Pagre</i>	<p><i>Highly vulnerable and red-listed species IUCN endangered species list</i></p> <p><i>Unrecognized stock</i></p>	<p><b>24 cm</b></p>	<p>It is easily confused with the pageot</p>
<i>Scallop</i>	<p><i>Stock threatened by predation :</i></p> <p>Atlantic coast, black scallops hunted by sea bream</p> <p>White scallop in danger of extinction due to starfish invasion</p>	<p><b>4 cm</b></p>	<p>Tender flesh with a taste of iodine</p>
<i>Redfish</i>	<p><i>Stocks under threat since the 1980s twenty</i></p> <p>Satisfactory stocks: <i>s. norvegicus</i> from Iceland and Greenland, <i>s. mentella</i> from Norway and the Barents Sea</p>	<p>Iceland's <i>s. norvegicus</i> fishery is MSC-certified</p>	<p>Often confused with scorpion fish, because of the strong physical resemblance, so be careful.</p>
<i>Bigeye tuna</i>	<p><i>Included in the IUCN Red List of Endangered Species; vulnerable species with variable stocks</i></p> <p>Sustainable stocks: Indian and Pacific Oceans</p> <p>Overfished stocks: Atlantic Ocean</p> <p>Stock at risk: Eastern Pacific Ocean</p>	<p>Avoid fishing with FADs, as this technique leads to the accidental capture of juveniles and endangered species (sharks, sea turtles, etc.).</p>	<p>Predatory species dependent on the decline of other species</p>

Bluefin tuna	<p>Species highly threatened by overfishing throughout the world around the world</p> <p>The resource has been drying up since the 2000s</p>	115 cm	Fatty meat, rich in omega-3s
Stingray	<p>1/3 of European species threatened according to IUCN</p> <p>Overfished but not endangered stocks in Europe: curly stingray, soft stingray, flowering stingray, brown stingray</p> <p>Sustainable stock: Northwest Atlantic; except for skate and ray, which are overfished.</p>	<p>40 to 105 cm</p> <p>Low fecundity makes skates highly vulnerable to fishing activity</p> <p>Avoid eating European skates</p>	White, slightly pink flesh
Shark	<p>1/3 of European species threatened according to IUCN criteria</p> <p>Endangered stock: everywhere, especially in the seas around Indonesia and Spain</p> <p>Reconstituted spotted dogfish stocks: Western Scotland/Ireland, Western English Channel, Bristol Channel and Celtic Sea</p> <p>Stock of emmisole being reconstituted</p> <p>Endangered: basking shark, shortfin mako, bigeye thresher, hammerhead, gulper shark, white shark and angel shark</p> <p>Since 2006, shark sales and exports have been controlled by an agreement between the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the FAO and the authorities of exporting countries; since 2012, the landing of separate shark fins and bodies in Europe has been banned (a policy also applied in the USA, Central America and Taiwan).</p>	<p>Beware of incomplete labelling of shark products, which can lead to confusion! Small sharks from North Atlantic waters are mainly sold fresh, headless and skinned under the name "salmonette".</p> <p>"This is not a variety of small salmon!"</p> <p>Avoid fin soup, especially in Asia, as it is directly linked to overfishing of the species.</p> <p>Species highly sensitive to the effects of overfishing due to late maturity and slow reproduction.</p>	Low-fat flesh, ammonia taste, rich in vitamin A and protein



Summary of recommendations from the three tables :

- do not buy or consume any marine species, and pay close attention to the provenance of products and the state of the stocks chosen so as not to contribute to the over-fishing of the species concerned;
- try to limit as much as possible the supply of bottom species, which are more fragile than most surface species;
- if you have a choice between different fishing techniques for your supply, try to choose the most eco-responsible of them all (e.g. line fishing rather than bottom trawling).

This list, compiled from data provided by the DORIS website<sup>16</sup>, Ifremer<sup>17</sup>, the European "Mr. Goodfish"<sup>18</sup> program, the WWF "Consoguide"<sup>19</sup> and Ethic Ocean's "Guide des espèces à l'usage des professionnels", is evaluated, of course, according to FAO estimates of fish stocks and progress in organic and sustainable farming. Bluefin tuna, for example, and in particular Mediterranean bluefin tuna, is included in the list of seafood products not to be consumed: however, there are now fisheries whose boats, registered with the International Commission for the Conservation of Atlantic Tunas (ICCAT)<sup>20</sup>, captain the world's most important fish stocks.

---

16 - R.W.D. Davies et al, "Defining an estimating global marine fisheries bycatch", Marine Policy, 2009.

17 - G. Macfadyen, T. Huntington and R. Cappell, "Abandoned, lost or otherwise discarded fishing gear", FAO, 2009.

18 - See in particular: "The ocean on your plate - WWF's guide to seafood", 2017; or "Ranking of canned tuna brands", Greenpeace, 2017; etc.

19 - WWF, "Living Planet Report: oceans, species, habitats and human well-being", 2015.

20 - IFREMER, fisheries resource management and issues surrounding the new Common Fisheries Policy

Bluefin tuna are only farmed once they have completed their migratory cycle and given birth, before being reared in offshore pools with wild fish whose traceability and sustainability are also controlled.

These tables relate mainly to industrial fishing, and need to be weighed up in the case of artisanal and line fishing, whose players are identified as such. Certain species, such as plaice, red sea bream, gilthead bream, halibut and sea bream, may be consumed in this case, taking into account peak seasonality and reproduction periods.

To complete the picture, let's look at an essential point: the different types and techniques of fishing. Their choice has a considerable impact on the environment. Knowing what they are and what's at stake allows us to make informed choices and avoid worsening the state of the seabed and threatening the survival of different species. Logically, the more indiscriminately fishing tools seek to extract in terms of quantity and size, the greater the damage of all kinds, all the more so as deep-sea species are much more fragile than others due to their slow growth and late reproduction. This is why bottom fishing is so difficult to defend from a conservation point of view. Bottom fishing catches peas with a variety of nets, mainly using

beam trawls in the southern North Sea, the most destructive method since their heavy chains lag the seabed, killing and accidentally capturing many soil-dwelling organisms. It's important to keep this in mind, even though there may be many overfished areas on the surface, which also give rise to environmental problems.

## THE DIFFERENT FISHING TECHNIQUES USED TODAY

Types of fishing	Great fishing	<p>Industrial fishing lasting more than 20 days, carried out on very large deep-sea trawlers, tuna boats or longliners 60 to 80 m long. The fish is often directly processed, and the crew can number up to 50 men.</p> <p>The species caught vary according to the fishing zone (trawlers head for cold seas to catch s a i t h e , cod or ling; tuna boats head for warm seas, such as the Atlantic and Indian Oceans; and longliners spend 3 months fishing for toothfish in the Antarctic).</p> <p>In Europe, there are just over 150 vessels of this type, representing less than 0.2% of the European fleet and 28% of the total fish caught.</p>
	Types of fishing	<p>The vessels concerned have an average crew of 5 to 6 men and spend between 4 and 20 days at sea. This type of fishing is practiced by trawlers over 38 m, mid-shore trawlers from 25 to 38 m, and offshore artisanal vessels from 16 to 25 m.</p> <p>These ships cruise off the coasts of Europe, capturing species such as hake, cod and whiting. Once caught, the fish are either frozen on board or iced in the ship's holds before being sold fresh at auction.</p> <p>They represent 7% of the European fleet, but 52% of the total fish caught in Europe (by weight).</p>
	Coastal fishing (or intensive artisanal fishing)	<p>It applies to trips lasting from 1 to 4 days, with a maximum crew of 4 men and vessels of less than 16 m. During these trips, the crew empties, cleans and freezes the species caught.</p> <p>These boats alone represent more than half the European fleet, but only less than 10% of the total fish caught in Europe.</p>
	Small-scale fishing (or artisanal fishing)	<p>In small-scale fishing, the "tide" cannot exceed one day (less than 24 hours out). It takes place along the coast, generally with a crew of no more than 3 men, on vessels less than 16 m long. Fish (mackerel, anchovies, sole, sardines, etc.) are landed fresh and sold at the auction or local market.</p> <p>These boats represent 33% of the European fleet, but only 1% of the total fish caught in Europe.</p>

Fishing techniques	Trawling	<p>Trawls are funnel-shaped nets that fall into two categories: bottom trawls to catch bottom-dwelling fish (hake, whiting, etc.) by weighting large nets with weights to reach the bottom of the water; and pelagic trawls for open-water fishing (anchovies, sardines, etc.).</p> <p>Bottom trawls are quite disastrous for the preservation of the seabed, as the chains or rollers attached to the front of the nets scrape the ground, tearing up flora and damaging or destroying corals and sponge colonies. Not to mention the fact that trawling results in much higher by-catch discard rates than handline and pole fishing.</p> <p>Bottom trawling has a negative impact on the fauna and flora of the seabed, while pelagic trawling has a moderate impact on other species. Trawls with heavy doors damage the seabed a little less, but still destroy the bottom biotope in the long term. The new electric beam trawls are expected to cause less damage to the seabed and fewer discards, although they are still in the trial phase and their effects are still being studied.</p>
	Purse seine fishing	<p>These rotating rectangular nets, with which ships encircle schools of fish in open water, can be 1 km long and 100 to 200 m high. Seines are used to catch pelagic fish, notably tuna and bluefish such as mackerel, anchovy and sardine.... The seine is used extensively in industrial fishing for small pelagic fish or sand eels.</p> <p>If they operate on the surface, seines have no impact on habitats, but this type of fishing poses the problem of discarding (= return to the sea of by-catches, injured or otherwise).</p>
	Net fishing straight and meshed	<p>Gillnets are straight nets, i.e. rectilinear webs stretched upwards by a rope fitted with floats and downwards by a weighted rope, used for fishing sole, cod, hake...</p> <p>The FAO has denounced the use of gillnets for ghost fishing, i.e. the catching of animals by fishing equipment lost/abandoned at sea, which is said to account for around 10% of marine litter.</p>
	Longline fishing	<p>This fishing method involves attaching several hooks with bait along a master line that can measure up to 20 km and carry 12,000 hooks with sardines and squid as bait.</p> <p>It is problematic insofar as it leads to numerous by-catches of seabirds, sharks, sea turtles and so on. The use of circle hooks reduces these accidental catches, and setting longlines at night reduces the number of birds caught.</p>

Fishing techniques	Angling	Artisanal fishing, when carried out by hand, is based on the use of lines (hooks fitted with bait or lures) or longlines (open-water lines fitted with hooks along their entire length).
	< Technology to be banned >	In some parts of the world, explosives such as dynamite are used to kill fish so that they float to the surface and can be easily harvested by nets.
	Fishing at cyanure	Cyanide is still used in some countries to stun fish, making them easier to catch.
	< Raw fishing stacés > Fishing dredging and locker	The traps (or "nasses") are made of plant netting (metal or plastic), fitted with conical inlets through which the crustaceans enter, and are raised each time they go out to sea. This technique can lead to ghost fishing when some traps are lost, but its overall impact on the environment is very limited.  Dredges, on the other hand, are bags with textile or metal mesh dragged along the seabed to capture various shellfish (scallops), sometimes buried in the sand (clams, cockles...). Because they stir up the seabed, they can destroy ecosystems if used unreasonably.

Sources :

- <http://bluefishseurope.org/>
- <https://www.msc.org/fr/nos-actions/les-oceans-engage-dans-le-danger/surpeche-peche-illegale-et-des-tractrice>
- <https://www.formation-maritime.fr/51-peche-maritime.html?start=4>
- <https://www.viande.info/la-peche>

Clearly, the types and techniques of fishing that specialize in bottom fishing, mass fishing and/or fishing with destructive biases (dynamite and cyanide) must be either limited or banned, depending on the extent of their impact on the environment.

The size of nets and their mesh, which plays a role in the nature and number of catches, and therefore in the number of potential by-catch discards, must also be taken into account at the time of procurement, to encourage the most eco-responsible market practices. To ensure the reproduction of the species caught, technical measures have been defined by geographical area: for example, they prohibit the capture of small fish and set a minimum mesh size for each type of net. Fish and shellfish are not the only victims of unwanted catches: every year, hundreds of thousands of cetaceans (whales, dolphins, porpoises) die in fishing nets, according to a 2004 report by the U.S. Ocean Commission. So it's not just small fish that are affected, but the whole marine eco-system, which is deregulated.

## **Labels that protect our oceans and our health**

As in the chapter on meat, we have set out to list all the labels and certifications available for seafood products, in order to help restaurateurs and consumers make the right choices on a daily basis. We are all increasingly aware of the urgent need to "consume better", given the sword of Damocles threatening the fauna and flora of our marine environments. According to Ifremer's 2020 figures, 49% of the fish caught in France comes from sustainably exploited populations (compared with 15% in 2000). We need to increase this already very respectable French score and achieve similar rates worldwide. Although the fishing industry is actively mobilizing, there are still problems with the selection of fishing gear and its impact on the environment. So it's becoming increasingly important to understand and sort out the various designations that exist.

The Global Sustainable Seafood Initiative (GSSI) is the most reliable tool to date for identifying the sustainability of the seafood products we buy. This international platform brings together industry professionals, NGOs, experts, as well as governmental and intergovernmental organizations, to identify the most credible programs among all those available on the market. The GSSI recognizes the following programs







that comply with the FAO guidelines for fishery and aquaculture products via common criteria and a transparent process, all through a collective, non-competitive approach.





**The gSSI assessment tool :**




- offers fishermen, aquaculturists, wholesalers and distributors a credible choice of certification programs that reduce costs and promote environmental sustainability;
- boosts consumer confidence in certified seafood products ([www.ourgssi.org](http://www.ourgssi.org));
- To date, gSSI has recognized the following certification programs: RFM ASMI (Alaska Seafood Marketing Institute), Iceland Responsible Fishing, MSC, gAA BAP and global g.A.P.


We felt it was important to mention this before presenting the table below, which lists the different designations, so that you can understand why we filled it in the way we did and with which designations.

## LABELS AND CERTIFICATIONS FOR SEAFOOD PRODUCTS

<p>Ecolabels for fish products</p>		<p>MSC (Marine Stewardship Council) for wild products and ASC (Aquaculture Stewardship Council) for farmed products are the 2 labels most often offered to consumers, particularly for frozen and canned products.</p> <p>Created in 1997 by WWF and Unilever, MSC is a private label certifying the sustainable management of fisheries certified by a non-profit NGO. It is one of the main labels in this sector, and focuses on &lt;&lt;good management of stocks&gt;&gt;. Today, around 20% of the fish caught by French fisheries hold this label. More than 37,000 products made from wild-caught resources worldwide currently bear the MSC label: 3,500 products in France, 1,306 in Switzerland, 1,398 in Belgium, 1,000 in France and 1,000 in Germany. and 4,697 in Germany.</p> <p>The three main principles of the label are :</p> <ul style="list-style-type: none"> <li>• Sustainable fish stocks</li> <li>-Minimized environmental impact</li> <li>-Effective fisheries management</li> </ul>
		<p>A cousin of the MSC, it was created in 2010 by an NGO to target aquaculture products.</p> <p>It guarantees that the fish is produced in an environmentally-friendly way, and under good working conditions. The label controls numerous criteria, right down to the farm's electricity consumption. The label can be found on 9 species: salmon, tilapia, trout, pangasius, shrimp and seaweed.</p>
		<p>"Pavillon de France" is supported by the inter-professional association "France Filière Pêche", which brings together producers, wholesalers, processors, retailers and fishmongers in France. The association's objectives are to develop sustainable and responsible fishing, and to promote the marketing of French fish products by enabling consumers to identify seafood products from French fisheries.</p>
		<p>Created by the World Forum of Fish Harvesters and Fishworkers in 2013, it concerns boats under 14 meters that "integrate criteria linked to the fight against overexploitation of fish, the safety of fishermen and the fragility of the artisanal fishing sector". An Icelandic artisanal cod fishery, Nasbo (National association of Small boat Owners), was certified in 2015 according to Artysan label criteria, and the Elior group (corporate catering) has joined the initiative.</p>

	 <p>Sustainable fishing" label</p>	<p>Sustainable fishing" label</p> <p>The "Pêche durable" label is France's first public ecolabel! It is supervised by FranceAgriMer, the national agency for agricultural and sea products, unlike its competitors, which are run by private organizations.</p> <p>This label aims to promote environmental, economic and social requirements. It currently concerns few products on the market, but is set to develop rapidly in France. The first French fishery to benefit from the "Pêche durable" label was certified in July 2019.</p> <p>Please note that this is not an environmental label guaranteeing the sustainability of the fishery or the species caught.</p>
B2B aquaculture labels	 <p>gAA (Global Aquaculture Alliance) label</p>  <p>Label global g.A.P.</p>	<p>Global Aquaculture Alliance is an international non-profit association dedicated to the development of environmentally and socially sustainable aquaculture.</p> <p>GAA promotes standards of "good practice" and coordinates the certification of sustainable aquaculture according to its own standards. Farms as well as processing sites can be certified, and currently no fewer than 700 companies are gAA-certified.</p> <p>GLOBAL g.A.P. (Good Agricultural Practice) is a private organization that sets certification standards for agricultural and aquaculture products on an international level. gLOBAL g.A.P. encourages fair partnerships between producers and distributors who wish to develop effective certification standards and procedures. 38 aquaculture species are involved in 28 countries.</p>
Ecolabel for aquaculture products	 <p>AB" label</p>	<p>The European Union's organic label, of which several public and private standards co-exist on the international market: the public "AB" label in France, the private "Bio-Suisse" label in Switzerland, the private "Biogarantie" label in Belgium, the "Soil Association" label in the UK and the "Naturland" label in Germany. European regulations governing organic aquaculture production have been in force since 2009, and have been mandatory since July 1, 2010. The European label appears on products as a complement or substitute for national labels.</p> <p>This certification ensures that farmed fish are raised in compliance with strict criteria:</p> <ul style="list-style-type: none"> <li>• no use of chemical pesticides, colorants or growth stimulants. Limitation of antibiotics;</li> <li>• plant supplements from organic farming (GMO-free in particular)</li> <li>• animal feed from fish products subject to quotas</li> <li>• lower cage density than in conventional farming to respect animal welfare.</li> </ul>

		<p>The AB label also exists for shellfish products such as mussels. Farming is carried out in waters of high environmental quality, and the production site complies with stricter environmental impact standards (cleaning products, etc.).</p>
<p>Other eco-labels</p>	 <p>Friends of the Sea" label</p>	<p>Friend of the Sea certifies both fish and farmed fish products, in accordance with the FAO's eco-trade code of conduct. In addition to fishery products, products used to feed farmed fish (meal, oil, feed, etc.) can also be certified.</p>
	 <p>Naturland" label</p>	<p>This German organization has developed standards for the certification of fishing products in developing countries (Nile perch in Tanzania), as well as in Spain (crayfish) and the Baltic Sea (herring). The criteria take into account the impact of fishing techniques on the environment and ecosystems, as well as working conditions and labor laws.</p> <p>For aquaculture products, Naturland standards for organic aquaculture are present in around twenty countries, and exist for certain farms raising trout, salmon, shrimp, tilapia or pangasius.</p>
	 <p>Dolphin Safe" label</p>	<p>This is the name of a campaign launched by the Earth Island Institute (EII) in the USA, and relayed by WWF in the 90s, to limit dolphin by-catch, particularly in tuna fisheries. Over 90% of tuna importers and distributors worldwide have signed up to the "Dolphin Safe" criteria.</p> <p>This label on cans indicates that the tuna has been caught using techniques that do not harm dolphins (but does not take into account any catches of other endangered species such as sharks and sea turtles).</p>
	<p>No DCP" mention</p>	<p>Some cans of tuna (yellowfin, albacore, etc.) are now labelled "line-caught" or "free-shelf caught". This means that the fish have been caught without the use of a Fish Aggregating Device (FAD). FADs lead to changes in fish behaviour and unwanted catches, and even if their ecological impact has not been fully identified, it is preferable to avoid altering the natural functioning of fauna and flora.</p> <p>Please note that this is a reference to the fishing technique used, not a certification or ecolabel.</p>

	 <p>Label Rouge</p>	<p>Created in 1960, the Label Rouge "attests to a level of quality superior to that of similar products usually marketed". In France, it is managed by INAO (Institut National de l'Origine et de la Qualité).</p> <p>It certifies compliance with very strict specifications, but only guarantees the quality of the food, not whether it is organic or not.</p>
--	--	---

Sources :

- <https://procsea.com/fr/filiere-mer/peche-durable-labels-produits-mer/>
- "Ethic Ocean's "Species Guide"

## **Favour shellfish and crustaceans**

Why should we choose this type of seafood over fish?

Shellfish have a beneficial impact on the environment. In fact, shellfish, particularly mussels and scallops, which are very common on our tables, play a decisive role in cleaning up polluted water. Take oysters, for example: a single mollusc can filter over 5 litres of water in 1 hour, capturing phytoplankton whose proliferation could lead to a lack of oxygen for other species. These molluscs and shellfish enable a whole world to live in perfect symbiosis, helping to maintain the balance between different marine organisms. They are essential to marine biodiversity. In some parts of the world, in the United States for example, oyster farms have even been reintroduced in bays or salt lakes to avoid the destruction of these natural areas. What's more, in addition to filtering the water and maintaining the biodiversity of marine organisms, shellfish have another advantage: they feed exclusively on algae and not on peas, unlike fish raised in aquaculture, which feed exclusively on other marine species.

However, as the non-governmental organization points out

WWF in its "Living Planet 2018" report, "marine and freshwater ecosystems are [...] under enormous pressure. Nearly 6 billion tons of fish and invertebrates have been fished from the oceans since 1950. Plastic debris has been detected in all major marine environments worldwide, from shorelines and surface waters to the deepest parts of the ocean, including the bottom of the Mariana Trench. Freshwater habitats, such as lakes, rivers and wetlands, are the source of life for all human beings, but they are also the most threatened, heavily impacted by habitat modification, fragmentation and destruction, invasive species, overfishing, pollution, forestry practices, disease and climatic change<sup>21</sup>".

Faced with the accelerating disappearance of marine species and habitats, one solution is to promote the consumption of molluscs, crustaceans and shellfish, whose cultivation, rearing and dissemination in marine or even freshwater environments contribute to a healthier environment. By promoting them, we contribute to cleaning up the oceans, reducing fish catches by industrial fishing and improving our health, as these seafood products are recognized for their dietary qualities. So eat them without moderation!

---

<sup>21</sup> - "Living Planet Report 2018: Let's be ambitious", Grooten, M. and Almond, R.E.A. (Eds), WWF, p. 7.

## **Algae, the little-known riches of our oceans**

First of all, let's remember that algae are freshwater and saltwater aquatic plants, and the oldest terrestrial plants on Earth. The co-edible species of seaweed are known as "sea vegetables", and there are almost 25,000 species worldwide, of various colors: red, green, yellow, brown. They thrive mainly in coastal areas, particularly in Brittany in the case of France. Six edible seaweeds are currently widely consumed: sea lettuce (*Ulva* sp.), dulse (*Palmaria palmata*), nori (*Porphyra* sp.), wakame (*Undaria pinnatifida*), kombu (*Saccharina latissima*) and sea beans (*Himantalia elongata*)<sup>22</sup>. Global production of macro-algae totalled almost 25 million tonnes in 2013, according to a 2014 FAO report, 96% of which comes from seaweed cultivation in Asian countries (China, Japan, Korea, Philippines). Seaweed is widely consumed in these countries: they are the world's leading consumers of seaweed, with Japan leading the way with nearly 14.5 g per person per year.

Here's a table summarizing their benefits and drawbacks.

---

<sup>22</sup> - Marie Lesueur, Charline Comparini, "La filière des algues dans le monde, en Europe, en France. Synthesis of results", Studies and Transfer Unit, AGROCAMPUS OUEST.



## BENEFITS AND DRAWBACKS OF EDIBLE SEAWEED

<b>BENEFITS</b>	<b>DISADVANTAGES</b>
<ul style="list-style-type: none"> <li>• low in calories and fat.</li> </ul> <p>Contain only 1 to 5% fat, depending on the species, and some algae (notably red algae) are high in omega-3 fatty acids.</p>	<ul style="list-style-type: none"> <li>• allergenic potential</li> </ul> <p>Not all seaweeds are edible, and some can provoke allergies. Before consuming algae for the first time, it is advisable to check that your body does not react excessively to their consumption.</p>
<ul style="list-style-type: none"> <li>• high protein, calcium and fibre content</li> </ul> <p>Seaweed contains between 8% and 70% protein, depending on the species (in ascending order, brown, red and green seaweed).</p> <p>&gt; compete directly with legumes and whole grains, even though they are less digestible for our bodies than animal proteins, except for spirulina (its digestibility is 60%, i.e. higher than the others).</p> <p>They also contain between 35 and 40% fiber, equivalent to 1kg of vegetables. As a food that soothes after ingestion, seaweed helps combat constipation, regulate blood sugar levels and fight cholesterol.</p> <p>What's more, seaweed contains 3 to 14 times more calcium than milk, led by wakame and kombu &gt; an 8g portion of dried seaweed provides more calcium than a cup of milk.</p>	<ul style="list-style-type: none"> <li>• high iodine content</li> </ul> <p>While iodine is essential for the proper functioning of the thyroid glands, too high a level can, on the other hand, upset them, creating hyper- or hypothyroidism.</p>
<ul style="list-style-type: none"> <li>• lots of iron, minerals and vitamins</li> </ul> <p>Seaweed has a much higher iron content than the famous spinach: 2.7 mg of iron per 100g, compared with up to 200 mg in the case of sea lettuce, for example, even though it is less easily assimilated by the body.</p> <p>What's more, seaweed is said to be able to "absorb" nutrients from the sea, hence its richness in minerals and trace elements, which account for up to 34% of its dry matter (which is very rare for a plant). In addition to vitamins A, B, D, E and K, they contain high levels of potassium, sodium, chlorine, magnesium, phosphorus and calcium. An excellent cocktail for your health!</p>	<ul style="list-style-type: none"> <li>• their incompatibility with an anti-coagulant diet</li> </ul> <p>The vitamin K contained in seaweed promotes blood coagulation. However, people on anti-coagulant medication should avoid taking vitamin K, as it may counteract the effects of their medication.</p>

**TABLE CONTINUED**

<b>BENEFITS</b>	<b>DISADVANTAGES</b>
<ul style="list-style-type: none"><li>• gelling, thickening and stabilizing properties</li></ul> <p>Gelling consistency 7 to 8 times higher than pork gelatin, and can be used as a thickener for sauces, soups or purées, for example / seaweed can be used to preserve ali- ments longer or intensify their colors &gt; more ecological and healthier alternative from an agri- food point of view.</p>	<ul style="list-style-type: none"><li>• heavy metal pollution</li></ul> <p>Algae tend to store pesti- cides and heavy metals contained in the water in which they grow &gt; pay attention to the level of pollution in the water from which the algae come, to avoid absorbing too high levels</p>

This table shows that eating seaweed has many more advantages than disadvantages, and that the latter are easy to manage. All the more so since, according to the Centre d'étude et de valorisation des algues (CEVA), sea plants represent a very eco-responsible foodstuff, since they grow naturally, without fertilizers, pesticides or blue water. In fact, a large quantity of nutrients can be produced on a sea surface, on the order of one eighth of the surface area required for the same crop on land, without any additional physical or economic resources.

The use of seaweed has many interests other than food, and deserves more attention in the years to come. As we have seen in the table, the use of macro-algae is very useful in the agri-food sector, both for humans and animals, thanks to the manufacture of additive flour. The pharmaceutical and cosmetics sectors have also found various uses for them, with seaweed extracts improving the moisturizing qualities of cosmetic products. Thalassotherapy uses ground seaweed pastes to relieve rheumatism and osteoporosis. Antiviral trials are underway to develop different seaweed-based treatments. Wastewater treatment exploits algae's strong capacity to absorb heavy metals and other pollutants to develop a range of filtering solutions<sup>23</sup>, turning this disadvantage into a major food interest.

---

23 - <http://www.fao.org/3/y5600f/y5600f07.htm>

Seaweed can also be used as a fertilizer, as has been the case on coasts since around the 19<sup>th</sup> century: buried in the soil, it helps to maintain humidity by acting as a conditioner thanks to its high fiber content, and the minerals bring useful trace elements to the soil; it's therefore a way of practicing agriculture in a completely eco-responsible and thrifty way. As you can see, algae production is perfectly exploitable in many fields, and the development of these various uses and ecological solutions should therefore be closely considered in our Less Saves the Planet approach.

In short, algae represent :

- new vegetables and a source of additional nutrients;
- food products that do not require agricultural land;
- production methods with environmental advantages;
- and therefore an interesting product to help meet the challenge of sustainable food in a context of global demographic growth.

How can restaurants take concrete action with the Less Saves The Planet label?

Limiting plates to 130g of seafood is a necessity. The requirement for supplier traceability also applies to these products. Traditional, ethical and eco-responsible aquaculture is essential. Likewise, wild fish must be caught using traditional methods, without trawling, and with respect for marine ecosystems. The label has drawn up three lists of fish, according to their origins and/or the reproduction of the species: fish to be favored, limited and not consumed. Chefs are invited to familiarize themselves with the list of fish to be eaten sparingly, and to draw inspiration from the list of fish to be eaten without problems. In addition, it is recommended to promote seafood products that are not fish-eating.

*"When the last tree has been felled,  
when the last river has been poisoned,  
when the last fish has been sinned  
against, then we'll know that money can't  
be eaten."*

Geronimo

*"On a cosmic scale, liquid water is rarer than gold."*

Hubert Reeves



## 4 - Save water

What role has water played in human evolution? Hippocrates, the father of medicine, explained in his medical treatises that our well-being depends on the right balance in our organism between the elements of earth, air, fire and water. Although knowledge of how the human organism functions has greatly evolved since Greek antiquity, the importance of water for health remains unquestionable: man cannot survive for more than three days without drinking, and no life is possible without water.

But history has shown us that its role is not limited to keeping us alive: water has also always nourished a form of spirituality. The Greeks, to whom Hippocrates belonged, celebrated the high points of the year with rituals organized around the virtues of water for the body. Many of the world's mythologies and beliefs celebrate water as a purifying and energizing element, and this almost mystical essence of water still survives in certain forms.

However, despite its vital necessity and curative virtues, today's societies are increasingly replacing it with other beverages, such as soft drinks. There are both taste and economic reasons for this. A certain extremely popular American brand of caffeinated soft drink is particularly concerned by this worrying shift, since it has become the owner of groundwater in the neighboring Latin American country, provoking a veritable health and ecological disaster. And while this phenomenon has not yet been reproduced by other brands of the same ilk, such practices are becoming more and more likely as time goes by.

There is an urgent need to reassert the curative, or at least sanitary, virtues of water, and to preserve its resources, which are becoming increasingly scarce every year under the influence of lobbies. To do this, we need to become fully aware of how fortunate we are to have access to it, and (re)learn how to save it on our own scale.

## **The central question of water as the source of life on Earth**

According to the first World Bank report published in November 2018, "nine out of ten natural disasters are water-related, six out of ten humans use sanitation facilities that do not meet minimum standards, and crops lost due to repeated droughts could feed 81 million people a year"<sup>1</sup>. According to the same

---

148 1- global Water Security & Sanitation Partnership , Annual Report 2018, Water's Edge: Rising to the Challenge of a Changing World, World Bank group

Current consumption practices and demographic trends suggest a 40% imbalance between global water supply and demand by 2030. Indeed, 70% of current water withdrawals are used for agriculture. To feed 9 billion people by 2050, agricultural production will have to increase by 60%, and water withdrawals by 15%. Added to this is the fact that water tables are being depleted faster than they are being replenished. As a result, by 2025, some 1.8 billion people will be living in regions or countries with absolute water shortages.

Similarly, the scarcity of water resources, exacerbated by climate change, could lead to increased migratory flows and violent conflicts in certain regions. The cumulative effect of population growth, rising incomes and urban expansion will be an exponential increase in demand for water, while water supplies will become more uneven and uncertain.

Water management concerns our world at all levels: States, through the major international organizations of the United Nations family, the FAO, the World Bank, or through commitments made at climate conferences. The UN has made access to drinking water and sanitation its sixth priority goal out of the 17 that concern sustainable development<sup>2</sup>. These goals have been set for 2019, and already in 2018 its General Assembly declared that the right to safe, clean drinking water is a "fundamental right."

---

2 - "Clean water and sanitation: why is it important? Development goals



essential for the full exercise of the right to life and all human rights<sup>3</sup>". On September 25, 2015, the United Nations General Assembly adopted "Sustainable Development Goals" (SDGs), brought together in the 2030 Agenda, in which Goal No. 6 or SDG 6 features prominently: "Ensure access to water and sanitation for all and ensure sustainable management of water resources."

These objectives are detailed as follows, with a list of targets to be achieved by 2030:

- Ensure universal and equitable access to affordable drinking water;
- Ensure equitable access to adequate sanitation and hygiene services for all.
- Improve water quality by reducing pollution, eliminating waste dumping and minimizing emissions of chemicals and hazardous materials, halving the proportion of untreated wastewater and significantly increasing the safe recycling and reuse of water worldwide;
- Ensure that water resources are used much more efficiently in all sectors, and guarantee the sustainability of freshwater abstraction and supply in order to overcome water scarcity and significantly reduce the number of people who lack water;
- Protect and restore water-related ecosystems, including mountains, forests and wetlands,

rivers, aquifers and lakes.

However, at the current stage, MDG 6 for 2030 seems out of reach: pollution is worsening, ecosystems are in decline and states' financing capacities or willingness are not up to the problem. In 2018, the World Bank therefore set up the Global Water Security & Sanitation Partnership (GWSP), an integrated platform that works alongside the least developed states to enable them to meet this major challenge.

Major institutions are multiplying their initiatives to raise awareness and try to change the global situation for the better. As citizens and restaurateurs, we all have a part to play in this process, even through seemingly insignificant everyday gestures. In the rest of this chapter, we'll look in more detail at how we use our blue gold, and how we can try to protect it from dramatic waste.

*"The one who moves the mountain is  
the one who starts removing the small  
stones."*

Confucius

## **How to accurately measure the water footprint of food? The differences between blue, green and grey water.**

It's hard to believe that calculating a country's water consumption is a recent preoccupation when you consider that

and the economic, social and environmental issues it raises today. In 2002, Professor Arjen Hoekstra of UNESCO-IHE developed the concept of water <sup>footprint</sup><sup>4</sup>. This footprint details the impact of human activities on a territory's water resources, and today highlights the water stress affecting certain lands around the <sup>world</sup><sup>5</sup>. It details the impact of human activities on a region's water resources. This footprint has inspired the LSP label to draw up tables listing the water consumption of different foods, calculated in liters of water per kilo produced.

However, before discussing these tables, it's important to remember that this is still only the first step in analyzing our total consumption, which is sometimes more complex than that. This is illustrated by the example of calculating the water footprint of livestock farming, which is at the heart of the concerns of scientists and economists around the world: the distinction between water literally drunk by animals and water consumed for cleaning pens or washing animals is highly controversial. In other words, the amount of green, blue or grey water consumed is a matter of debate in this field.

Take beef, for example.

According to Stéphane Delogne, representative of the Federation of Breeders and Farmers (FUGEA), a simple calculation shows that a steer consumes between 70 L and 100 L of water per day. "Knowing that it takes around 3 years to produce 200 kg of beef, this works out at between 76,650 L and 109,500 L.

---

152 5 - "Humanity's water footprint", Sustainable Planet, 2014; (<https://planetevisible.org/em-preinte-hydrrique-humanite/>).

L of water. Or 383 to 547 L for 1 kg of beef. Not 15,000 L." He adds: "You'd have to be an idiot - or sometimes a journalist - to believe such things. 15,000 L of water is what a human swallows for 20 years. A cow would need 800 years of human consumption for that". The Institute therefore recognizes a consumption of 20 to 50 L eq-H<sub>2</sub>O/kg, a figure supported by the ISO 14046 standard in France.

However, Less Saves The Planet bases its study on criteria other than the water drunk by cattle. In line with the report by M. M. Mekonnen and A. Y. Hoekstra de, 2010, "The green, blue and grey water footprint of farm animals and animal products, Value of Water Research Report Series", we believe that if the water footprint exceeds 15,000 L of water, it's due to animal feeding, which requires a great deal of natural (green water) or organized (blue water) watering.

Radio Canada carried out a very telling study. It calculated how many liters of water a 3-year-old, 200 kg steer has consumed since birth:

- 24,000 L of drinking water in 3 years;
  - 7,000 L of water used on the farm and at the slaughterhouse ;
  - 3,000,000 L of water behind the 8,500 kilos of grain and forage he has eaten in his life.
- Total: 3,031,000 L, i.e. 15,155 L / kg.

For our tables, we'll use the official figures given in the Mekonnen and Hoekstra report, which are also very similar to the Radio Canada study.

Three very different water footprints can be distinguished, with very different consequences for the environment:

- To begin with, the green water footprint of a food corresponds to the volume of water captured during plant growth or drunk by the animal in the form of moisture, rain or water stored in the soil. Green water growth is a natural and eco-responsible consumption of water.
- Next, the blue water footprint is the volume of freshwater reclaimed by man from water resources. "This water has been extracted by man and then consumed for industrial, domestic or agricultural purposes. This water has been extracted by man and then consumed for industrial, domestic or agricultural purposes.
- Finally, the grey water footprint, or return flow, is the volume of water polluted during production. It corresponds to the volume of water needed to dilute the pollutants so that water quality meets the standards acceptable to our environment. Pesticide-polluted water reaches the ground and even ends up in the rain.

This means that a product that consumes a lot of water can in fact be completely eco-responsible if the water used to grow it is captured naturally, in other words when the resource used is green water. This is the case, for example, with organic vanilla from Madagascar. With a water consumption of 126,505 liters per kilo produced, vanilla is one of the most water-hungry foods. However, the humid, hot climate and high rainfall of the

Madagascar help this plant to grow easily with almost no watering. Likewise, vanilla's simple, natural development makes the use of pesticides and GMOs of little use in the region. As a result, 85% of Madagascar's vanilla production is certified organic, and at the same time requires very little blue water. For it is indeed the consumption of blue water that poses a problem for our planet today, and it is this that we must monitor and, if possible, reduce.

Now that we've covered all the key elements needed to understand what follows, let's move on to the food water footprint tables.

	Aliment	Empreinte en eau
Origine animale	Lait	1020 L/kg
	Œufs	3265 L/kg
	Poulet	4325 L/kg
	Beurre	5553 L/kg
	Porc	5988 L/kg
Céréales	Blé	1827 L/kg
	Riz	1673 L/kg
	Orge	1423 L/kg
	Maïs	1222 L/kg
	Avoine	1788 L/kg
Fruits à coque	Noix de cajou	14 218 L/kg
	Marron	2750 L/kg
	Amandes	8047 L/kg
	Amandes écalées	16 000 L/kg
	Noix	4918 L/kg
	Pistache	11 363 L/kg
	Noisette	5258 L/kg
	Noisette écalée	10 500 L/kg
	Carotte	195 L/kg
Caroube	5994 L/kg	
Oléagineux	Arachide	2782 L/kg
	Huile d'arachide	7582 L/kg
	Noix de coco	2687 L/kg
	Huile de palme	1098 L/kg
	Huile d'olive	14 431 L/kg
	Huile de tournesol	6792 L/kg

	Aliment	Empreinte en eau
Oléagineux (suite)	Huile de colza	4301 L/kg
	Sésame	9371 L/kg
	Graine de lin	5168 L/kg
	Graine de chanvre	3685 L/kg
	Graine de moutarde	2809 L/kg
Légumes	Chou	280 L/kg
	Artichaud	818 L/kg
	Asperge	2150 L/kg
	Laitue	237 L/kg
	Epinard	292 L/kg
	Tomate	214 L/kg
	Coulis de tomate	713 L/kg
	Choux-fleurs/Choux de Bruxelles	285 L/kg
	Brocoli	285 L/kg
	Potiron	336 L/kg
	Aubergine	362 L/kg
	Concombre	353 L/kg
	Ail	589 L/kg
	Piment	379 L/kg
	Oignon	272 L/kg
Fruits	Banane	790 L/kg
	Orange	560 L/kg
	Jus d'orange	1018 L/kg
	Soja	2145 L/kg
	Lait de soja	3763 L/kg
	Citron	642 L/kg

	Aliment	Empreinte en eau
<b>Fruits (suite)</b>	Pamplemousse	506 L/kg
	Pomme	822 L/kg
	Poire	922 L/kg
	Abricot	1287 L/kg
	Cerise	1604 L/kg
	Pêche	911 L/kg
	Fraise	347 L/kg
	Framboise	413 L/kg
	Groseille	499 L/kg
	Myrtille	845 L/kg
	Raisin	608 L/kg
	Pastèque	235 L/kg
	Figue	3350 L/kg
	Mangue	1800 L/kg
	Avocat	1981 L/kg
	Ananas	255 L/kg
	Datte	2277 L/kg
	Kiwi	514 L/kg
Papaye	460 L/kg	
Plantain	1602 L/kg	
Prune	2108 L/kg	
<b>Légumineuses</b>	Haricot sec	5053 L/kg
	Fève	2018 L/kg
	Pois	1979 L/kg
	Pois chiche	4177 L/kg
	Niébé	6906 L/kg
	Lentille	5874 L/kg

	Aliment	Empreinte en eau
<b>Epices et aromates</b>	Café	15 897 L/kg
	Graines de cacao	19 928 L/kg
	Poudre de cacao	15 636 L/kg
	Chocolat	17196 L/kg
	Thé	8856 L/kg
	Poivre	7611 L/kg
	Vanille	126 505 L/kg
	Cannelle	15 526 L/kg
	Clou de girofle	61 205 L/kg
	Graine de muscade	34 319 L/kg
	Anis, badiane, fenouil	8280 L/kg
	Menthe	288 L/kg
	Gingembre	1657 L/kg
<b>Sucres</b>	Canne	210 L/kg
	Betterave	132 L/kg
<b>Tubercules</b>	Pomme de terre	287 L/kg
	Manioc	563 L/kg
	Igname	343 L/kg



## **Foods to be eaten in moderation**

While the example of Madagascan vanilla helps to put the water requirements of the fruits and vegetables we grow into perspective, this is unfortunately not the case for all of them. A number of fruits, plants and vegetables are heavy water guzzlers, and it's advisable to limit them to comply with the rules of the "Less Saves The Planet" menu, as their consumption of blue, green or grey water is not necessarily controllable or balanced.

This is true of nuts, particularly shelled almonds, whose water footprint (liters of water used per kg of food) is 16,000 L / kg, cashews (14,480 L / kg) and pistachios (11,363 L / kg). But they're not the only ones. Coffee and chocolate, darlings of consumers the world over, also have a particularly high water footprint: 15,897 L / kg for coffee, 19,928 L / kg for cocoa beans. It seems necessary to reduce consumption by limiting them to small, occasional pleasures (they'll be all the better for it!).

Moreover, the production of cocoa beans - a highly prized product worldwide, used to make chocolate (in powder form, bars, beverages...) - requires a large workforce and its indus-

trialization is having a major impact on the environment in tropical zones. The phenomenon of deforestation in favor of cocoa plantations has become endemic in West Africa. The NGO Mighty-Earth notes that in Ghana, between 2001 and 2014, 7,000 km<sup>2</sup> of tropical forest were replaced by cocoa plantations, and that at this rate, apart from national parks, tropical forest will have disappeared in this country by 2024.

The same is true of other tropical rainforests, such as the Peruvian Amazon, the Congo Basin and the paradise forests of Southeast Asia, where cocoa cultivation is also expanding in response to growing global demand for chocolate. Following this report, Prince Charles, Prince of Wales, summoned the CEOs and senior executives of 34 major chocolate companies to urge them to take action against deforestation. Following this warning, these companies agreed to join the Bonn Challenge, a global partnership set up in 2011 at Germany's initiative and aiming to restore - in less than a decade (2011-2020) - 150 million hectares of forest landscapes. In the meantime, we must remain vigilant and give preference to chocolates that guarantee the "clean" origin of the cocoa beans used to make our desserts (Fair Trade, Organic agriculture...).

Beware, too, of certain spices whose water footprint is so high, that their use should be moderated: cloves (61,205 L / kg), nutmeg (34,919 L / kg) and cinnamon (15,526 L / kg). Conversely, some vegetables are particularly sober, such as carrots (195 l / kg), beet sugar (132 l / kg) and cane sugar (210 l / kg), watermelon (235 l / kg) and mint (280 l / kg).

To complete this chapter, Less Saves The Planet has drawn up a table listing the recommended origins of the plants that consume the most water. The table has been drawn up on the basis of plants' water requirements in relation to the climatic conditions of the countries in which they are grown, in order to highlight those producing countries that are by nature the most ecoresponsible. We summarize our recommendations for sensitive products that play an essential role in our preparation and cooking methods: cocoa, coffee, almonds, cloves, pistachios, hazelnuts, nutmeg, cashews, cinnamon and vanilla. For each of these ingredients, we give the origins to be favoured, the production criteria to be checked and the labels to be favoured to be in line with the objectives of a more sober consumption and more respectful of the planet. In this way, you'll have all the keys you need to understand the challenges of producing fruit, vegetables, etc. in an eco-responsible way.

Products	Better weather conditions for production	Countries of origin and recommended producers	Organic production criteria
<p><b>Cocoa</b> (Chocolate)</p>	<p>- Today, it is grown on every continent in tropical latitudes, as it requires a warm climate all year round (23 to 28°C) and very high humidity, with annual rainfall of between 1,500 and 2,000 millimeters.</p> <p>- It is often grown under the shade and protection of higher trees in the rainforest (the &lt;&lt; mères cacao &gt;&gt;) to protect it from strong winds and direct sunlight.</p>	<p>Organic production worldwide (0.5% of the global cacao market) :</p> <ul style="list-style-type: none"> <li>- Latin America ( 90% of world exports ) , Nicaragua and Costa Rica ( but intended for local markets )</li> <li>- Africa ( Ghana , Nigeria , Ivory Coast , Cameroon , Congo , Madagascar )</li> <li>- Vietnam (since 2022) , Vanuatu (1/5 hectare organic in 2010)</li> <li>- Caribbean ( Jamaica , Haiti , Grenada , Trinidad )</li> </ul>	<p>AB organic chocolate complies with European Directive CE 2092/91 concerning the world of production:</p> <ul style="list-style-type: none"> <li>- Production and packaging chain with labelling mentioning the number of the inspection body to which the producer is subject (traceability).</li> <li>- "Plantation example of chemical fertilizers for 5 years and no chemicals authorized to produce chocolate</li> </ul>
<p><b>Café</b></p>	<p>Requires subtropical to temperate temperatures between 18 and 25° C to grow</p> <p>Coffee fears extremes of temperature but needs abundant, well-distributed rainfall (during the dry period, night dews are very beneficial) as well as shade.</p> <p>Can only produce a good annual crop in poor soil permeable , derived from the decomposition of volcanic rocks and slightly clayey / sandy</p>	<p>Indonesia , Panama , Jamaica , Ethiopia , Brazil</p> <p>Organic coffee-producing countries: Honduras (volume doubled between 2010 and 2012), Mexico , Ethiopia , Peru ( 3/4 of the world's organic coffee production was in Latin America in 2008)</p>	<p>IFOAM (the international organization for the direction, union and support of organic farming worldwide) requires organic coffee to be pulped, dried and packed in jute sacks &lt;&lt; by exclusively natural means &gt;&gt; and that it is produced without the use of GMOs or pesticides (ban on the use of chemical products for at least 5 years on the plantation, only organic fertilizers authorized).</p> <p>Supplier traceability: organic coffee must be certified in the country where it is produced and in the country where it is roasted.</p>

Products	Better climatic conditions for production	Countries of origin and recommended producers
<b>Hazelnut</b>	Mild and relatively humid climate (oceanic, seaside)	Origin France : mostly in Aquitaine and Lot-et-Garonne  Turkey, Italy, Sicily (first organic growers)
<b>Nutmeg</b>	Tropical climate: Hot and humid zones	The Molusque archipelago  Sri Lanka , Kerala ( southern India ) , Indonesia
<b>Cashew nuts</b>	Warm, sunny climate (needs water minus 6 hours of direct sunlight a day)  Suitable temperature: 25°C but can easily withstand temperatures from 10°C to 40°C	African countries account for 36% of world production 36% of world production (particularly Mozambique)  Focus on producer and processor countries (Vietnam, Brazil and India)
<b>Cinnamon</b>	A tree that grows in wild forests in tropical climates (hot, humid areas) and is harvested early in the morning, usually in the spring, on rainy days.	Ceylon (the highest quality variant on the market)  most eco-friendly production: Indonesia , Sri Lanka , Seychelles , Madagascar  Avoid China, Laos and India
<b>Vanilla</b>	Need a warm, humid tropical climate at latitudes between 25°N and 25°S with rainfall of around 2,000 mm per year  Grows at altitudes of up to 1,000 meters, as long as temperatures are between 20 and 30°C.	The United States, France and Germany are the world's top three vanilla exporters and the top three re-exporters (together accounting for around 80% of world vanilla trade).  Most responsible production: Madagascar (over 85% organic) , LaRéunion , Mayotte

Sources :

- 1- [https://www.natexbio.com/cacao-bio-23-des-surfaces-mondiales-de-cacao/#:~:text=The%20cacao%20produces%20in%20Am%C3%A9rica,in%20Mexico%20and%20in%20Bolivia. https://www.universalis.fr/encyclopedie/cacao/2-les-cacao-growing-climatic-conditions/#:~:text=The%20cacao%20is%20of%20nos,500%20%C3%A0%202%20000%20millim%C3%A8tres.](https://www.natexbio.com/cacao-bio-23-des-surfaces-mondiales-de-cacao/#:~:text=The%20cacao%20produces%20in%20Am%C3%A9rica,in%20Mexico%20and%20in%20Bolivia.https://www.universalis.fr/encyclopedie/cacao/2-les-cacao-growing-climatic-conditions/#:~:text=The%20cacao%20is%20of%20nos,500%20%C3%A0%202%20000%20millim%C3%A8tres.)
- 2- Natexbio (Fédération des transformateurs et distributeurs bio), Le café bio, 25/03/2014, (<https://www.natexbio.com/le-cafe-bio/#:~:text=Les%20principaux%20pays%20producteurs%20de,%C3%A9tait%20tr%C3%A8s%20importante%20en%202011.>) <http://www.cafesaveur.net/le-cafeier/climat-et-sol.html>
- 3- [https://www.researchgate.net/publication/283642327\\_Carbon\\_Footprint\\_of\\_Tree\\_Nuts\\_Based\\_Consumer\\_Products](https://www.researchgate.net/publication/283642327_Carbon_Footprint_of_Tree_Nuts_Based_Consumer_Products)  
<https://fr.wikihow.com/faire-pousser-un-amandier>
- 4- (<http://www.fedalim.net/wp-content/uploads/2018/03/Newsletter-FEDEMET-N%C2%B08-Le-clou-de-girofle.pdf>)
- 5- <https://www.planetoscope.com/fruits-legumes/1400-production-mondiale-de-pistachios.html#:~:text=The%20importers%20major%20of%20pistachios,of%20pistachios%2C%20220%20000%20tonnes.>
- 6- Interfel website and 2017 FAO data from the gastronomiac website
- 7- Newsletter n°10 of November 2018, (SNPE) Nutmeg, Syndicat National des transformateurs de poivre, épices, aromates et vanille and Syndicat national des fabricants de Mélanges Technologiques pour l'Industrie Alimentaire (SYMtia) [https://www.jardinsdefrance.org/la-production-mondiale-depices/](https://www.jardinsdefrance.org/la-production-mondiale-depices/(fedalim.net/wp-content/uploads/2018/11/FEDEMET_10.pdf))  
([fedalim.net/wp-content/uploads/2018/11/FEDEMET\\_10.pdf](http://fedalim.net/wp-content/uploads/2018/11/FEDEMET_10.pdf))
- 8- Ecocert France website
- 9- CIRAD (Agricultural Research for Development) website
- 10- Web-magazine Ingrebio (<https://ingrebio.fr/tag/vanille/>) and Consoglobe website

## **How to save blue water in agriculture? Different types of watering and their effects on the environment**

If you've ever worked in a vegetable garden or grown flowers in a garden or on a balcony, you've probably noticed that watering can be a more complex activity than it seems in many respects. Whether it's the frequency or quantity of water to give to different types of plants, depending on their specific characteristics and number, there are many parameters to take into account. And even if the wastage caused on an individual scale by trial and error is generally not significant, it's always a good idea to be aware of the different types of watering to avoid wasting this precious resource as much as possible.






Let's not forget that blue water isn't the only water that can be used for watering: a very simple trick to avoid using too much water on a daily basis is to recover, in a bucket for example, the water used for cooking pasta or for bathing (only if the soaps used in this water are organic and eco-responsible and don't risk polluting the soil in the long run) and use it to water your plants or crops. Eco-responsible crockery goes perfectly with this eco-friendly tip. For restaurateurs, the water in carafes left unused by customers is ideal for this purpose. The tip also applies to rainwater, and the two can of course be combined. But in






In summer, or in drier or even arid regions, recycling certain types of domestic water can easily replace it. By adopting this simple reflex, water savings over the year can be substantial, both economically and environmentally!







At the level of hotel restaurants, water wastage through watering is even more significant: it must become a determining criterion in the choice of suppliers. Clearly, mentalities and practices need to be changed in the agricultural system if change is to be truly efficient for the planet.

To get a clearer picture, let's take a look at the main ways of watering a field or other cultivated area, and the amount of water each requires, to assess their impact and efficiency.



<p>Sprinkler irrigation</p>	<p>Sprinkler irrigation is an irrigation technique in which water is delivered to plants in the form of artificial rainfall. It developed rapidly after the 2nd World War, particularly in the arid and semi-arid regions of Europe and the United States.</p>	
	<p>Fixed or permanent ramp</p>	<p>Semi-portable or portable, the ramps are buried at regular intervals.</p>
	<p>Swivel ramps</p>	<p>Automated, a boom rotates around a fixed pivot. This circular irrigation system is suitable for all types of open-field crops, as it enables precise water application that is insensitive to wind. As such, it is one of the most widely used systems, alongside central pivot irrigation.</p>
	<p>Front ramps</p>	<p>Automatically sprinkles the field mechanically back and forth</p>
	<p>Irrigation booms on wheels</p>	<p>Agriculture moves a tractor equipped with an irrigation pivot around the areas to be watered</p>
	<p>Rewinders</p>	<p>A long, coiled hose connected to the water network like a conventional watering hose. It is then handled by farmers by hand. The most widespread in the world, accounting for more than half of all irrigated areas, because of its adaptability to plot size and low maintenance costs.</p>

<p>Sprinkler irrigation</p>	<p>Surface irrigation works optimally on sloping fields to irrigate one or more of its furrows: water flows freely under the action of gravity, with the surface of the field as the means of transport and distribution, making it possible to manage water with greater flexibility and a considerably reduced unit flow rate.</p>	
	<p>Board irrigation</p>	<p>Water is supplied to long, rectangular, sloping plots via drainage at the lower end of the field. Water is spread over the various furrows of the plots by means of planks to water the soil thanks to the unevenness; very suitable for most types of crops and soils, especially those with slow infiltration rates and tolerance to prolonged flaking.</p>
	<p>Irrigation by basin</p>	<p>Complementary irrigation based on the collection and distribution of different types of runoff water, in particular runoff from land upstream of the basin, on crops.</p>
<p>Stingray Irrigation Water partially covers the ground, then infiltrates and rises by capillary action</p>		
	<p>Siphon irrigation</p>	<p>Connects the basin directly to the areas to be watered via feed channels around the field. The water then flows by gravity.</p>
	<p>Valve boom irrigation</p>	<p>More precise and constant adjustment of the water flow rate, but need to study the dimensioning required.</p>
	<p>Irrigation using flexible sheathing or transirrigation (rigid pipes)</p>	<p>Similar to siphon irrigation, but for flat terrain. Pipes with calibrated orifices run through each row, releasing water regularly. Inexpensive and easy to install, but rather fragile, with an imprecise flow rate.</p>

Drip irrigation	Drip irrigation is a slow, localized application with a pre-determined flow rate through drippers, which requires a fairly high level of investment but results in very economical use of water. First developed in Israel in the 60s, drip irrigation has since been exported mainly to Africa (notably Kenya), but also to the water-starved maize, vineyards and orchards of southern France.	
<b>External route</b>		
	Long- or short-circuit dripper/duct	A small, thin-walled, floor-mounted device designed to deliver a slow, steady flow of a few liters of water per hour. Install with care, as it's fragile, even if inexpensive.
	Diffuser	Static sprinklers positioned 0.4 m above the ground, spraying water over part of the soil surface at the level of the crops concerned.
	Calibrated orifice/adjustment	Installed on an evenly spaced milling ramp with controlled flow rate
	Irrigation with underground pipes	Irrigates at a depth of about 30-40cm close to the roots, but excludes the possibility of deep tillage (onions or potatoes).
	Irrigation with porous ceramic vessels	Used in the Near East and North Africa
	Irrigation with sectioned poral pipes	Used in Zimbabwe, it irrigates two rows of plants with a single underground conduit planted on either side of the pipe.

Sources :

- Irrigazette (The Leading International Irrigation magazine); Nadia Saiyouri, "Irrigation methods in arid environments", 2012;
- Rivulis; Agronomie Info; Dossier sur les pivots d'agriculture et les territoires par la région Pays de la Loire, January 2015 ;
- "Évaluation des économies d'eau à la parcelle réalisables par la modernisation des systèmes d'irrigation", study carried out with the support of the French Ministry of Agriculture and Food, September 2017.

All the irrigation techniques described above can be useful and adapted to suit the climate, the terrain and the number and type of plants to be watered. Mechanized sprinkler irrigation is undoubtedly the most widespread in modern, large-scale agriculture.

Nevertheless, drip irrigation is the most water-efficient method, and the most suited to crop needs thanks to its thoroughness and precision. Buried drip irrigation is slightly more efficient than surface drip irrigation, since it avoids evaporation.

Whether the plants to be watered are in pots, tubs or planted in the ground, once the appropriate equipment has been installed, this method is the least restrictive of all, as it is completely autonomous. According to Netafim, the Israeli specialist in this technology, the drip system consumes 30% less water than surface or sprinkler irrigation. The water does not evaporate, nor is it blown away from the crop by the wind: it suffers no loss through drift or evaporation. The Institut national de recherche en sciences et technologies pour l'environnement et l'agriculture (Irstea), which has been testing in-ground drip irrigation in Montpellier since 2008, even reports savings of 15-20%. What's more, diseases related to water stagnation on leaves, which affect certain types of surface irrigation, cannot develop in a drip system where plants receive

only what they need to grow.

However, this type of irrigation is still very little developed in Europe, apart from its use by a few private individuals, despite its proven effectiveness. As Hervé Pascal of IMH Distribution, French distributor of Netafim in-ground drip irrigation, laments: "Drip irrigation is very efficient, but France has no policy to encourage water savings. If restaurateurs were to use drip-irrigated products, the percentage of water saved would be significant: the total number of equivalent liters of water saved per dish per day can quickly become significant.

Despite the development of possible leaf diseases, and even if this depends on the nature of the crops being irrigated, surface irrigation using water run-off from ponds can also prove to be very environmentally-friendly, all the more so if it makes use of rainwater. The amount of water delivered to plants on sloping ground may not be the most appropriate option for all cultivable surfaces: if the farmer adapts his crops with more water-hungry plants, we'll be talking more about transferring water than saving it. In our opinion, however, it is still preferable to irrigation, which only uses blue water and requires considerable human and material resources.

The idea is to encourage the development of drip irrigation on our own scale, or of the

Whether in our own garden or in the choice of products we buy on a daily basis.

Agriculture is not only one of the main causes of water shortage, but also one of its main victims. By paying attention to the water consumption of the products we buy, we can have a direct impact on the state of the planet. In 2017, according to the FAO, agriculture accounted for almost 70% of water withdrawals, far ahead of industry and domestic <sup>use6</sup>. Water scarcity is set to intensify under the impact of climate change. Global temperatures are predicted to rise by between 1.6°C and 6°C by 2050. Each degree of global warming will mean a reduction in renewable resources (by at least 20%) for 7% of the world's population. The increased frequency and severity of droughts is already having an impact on agricultural production, since rising temperatures mean that plants need more <sup>water7</sup>.

There is room for improvement, however, particularly in the way water is used to produce food. In fact, the FAO has set up training biases in twenty countries to encourage the modernization and rehabilitation of specific forms of irrigation to meet today's climate and water consumption challenges. Taking up the point made at the beginning of the chapter on water use, the organization explains: "With increasing competition from other sectors,

---

6 - Source FAO, The global Framework on Water Scarcity in Agriculture, 2018

7 - Source FAO, idem, 2018

irrigation is under pressure to reduce its share of water use. At the same time irrigation is regarded as one of the main means for increasing food production and rural incomes. This is why it is imperative to modernize irrigation systems and improve irrigation governance in order to achieve high water productivity and sustain the resources base <sup>8</sup>. In other words, the challenge must be met today if we are to save tomorrow's world.

### **Farmer seeds, the key to waterless farming**

While choosing the most eco-friendly irrigation possible seems to be a priority for preserving our water resources, agriculture can also make huge savings in water and energy by using farmer seeds. Farmers' seeds are directly descended from the seeds that farmers selected and multiplied in their fields before the development of varietal selection in the <sup>19th</sup> century and GMOs in the <sup>20th</sup> century. They are seeds collected from the wild or from a previous harvest, and are not subject to any patent, only to traditional agricultural use. These seeds are much more resistant to water stress, and therefore consume much less water to grow. They also have a positive effect on biodiversity, as their hardiness makes them much more resistant to disease and parasitic attack.

The return to peasant seeds, which is taking place in both developed and emerging economies (Brazil, Middle East...), is a real success story. Adopting them is not only an economic choice, but also an ethical and responsible one, especially since, although they may be less productive, they produce cereals, vegetables and plants that are much richer in nutrients.

According to Pascal Poot, the only farmer in Europe to use exclusively peasant seeds on his farm in the Lot-et-Garonne region, these seeds have the ability to draw phosphate and other nutrients from the subsoil, enabling them to grow in conditions that would appear to be very hostile to agricultural activity. Operating on the same survival model as our forests, these traditional seeds need very little water and no pesticides, even in scorching regions. Instead, they draw on the resources of their ancient genetic heritage to survive in the face of potential attacks from disease and climate. And thanks to this resourcefulness, they produce all the more antioxidants and taste, and have long-term yields far superior to those of industrial seeds.

These seeds are therefore even more effective than the best drip irrigation, since they



are extremely self-sufficient and produce an excellent quantity/need ratio. Conversely, plantations grown from hybrid or GMO seeds have very high water requirements and need constant maintenance to protect them from external aggression. This makes them much less profitable and ecological in the long term than other crops, contrary to what you might think. The use of astronomical quantities of water and harsh treatments to keep them alive is not only very costly for farmers, but also bad for the earth, our health and our future.

Unfortunately, the use of peasant seeds is still too timid at present. While waiting for legislation to authorize farmers to use them freely, private individuals can already take advantage of the 2016 law on the preservation of biodiversity, which authorizes the exchange and sale of these seeds for amateur use. This will enable you to grow many varieties of quality plants with minimal maintenance, and thus save the planet and biodiversity on your own scale!

### **Our tips for becoming water-savvy<sup>9</sup>**

Let's finally learn how to save water when cleaning our vegetables, thanks to some very simple techniques! Every day, we waste millions of liters of water because we don't know how to clean fruit and vegetables.

---

174 9 - Sources: UMIH, guide des bonnes pratiques d'hôteliers : vaincre le gaspillage (2016) and UMIH, Lutter contre le gaspillage dans son restaurant (2015)

The figures are overwhelming. Yet it is possible to make significant water savings by taking a few simple steps. When we clean fruit and vegetables with water, even if we remove all traces of soil, bacteria and traces of pesticides and insecticides still remain on the surface, as they are not soluble in water. Washing them under a trickle of water is pointless and leads to colossal losses. Here are three effective tips for cleaning your fruit and vegetables as water-savingly as possible.

#### Tip 1: Use baking soda to remove pesticides from fruit and vegetables

Did you know that to wash fruits and vegetables, you can simply soak them in water with a little sodium bicarbonate (1 tablespoon per 1 liter of water) instead of rinsing them under running water, and that this is much more effective? An experiment published in 2017 in the American scientific journal *Journal of Agricultural and Food Chemistry*<sup>10</sup> shows that sodium bicarbonate, thanks to its antiseptic and degrading power with regard to the benzene conjugated groups of pesticides, enables complete elimination of surface pesticides after just under 15 minutes of soaking. Peeling is also effective, but has the disadvantage of removing nutrients, which are mainly present in the surface layer of fruit. For organic fruit and vegetables, on the other hand, the antiseptic power of sodium bicarbonate is sufficient to remove the bacterial population.

---

10- Yang T, Dherty J, Zhao B, Kinchia AI, Clark JM, Effectiveness of Commercial and Homemade Washing Agents in Removing Pesticide Residues on and in Apples, *Agric Food Chem*, November 2017.

surface. What's more, sodium bicarbonate is totally edible in these quantities, and any residues on cleaned vegetables or fruit are harmless.

#### Tip 2: Salt

Put two tablespoons in a 2-liter basin and leave your fruit and vegetables to soak. The salt will have the same effect as the bicarbonate.

#### Tip 3: Apple vinegar, for its antiseptic properties

Use one tablespoon per 2 liters of water and leave to soak.

To show you the benefits of our various tips, let's take a look at a concrete example. This example will prove to you that nothing can save the planet. This table shows the water impact of a kilo of tomatoes washed in a tub rather than under tap water. We have based our calculations on recognized data, such as the fact that a standard tap drains 12 L of water per minute, but also on assumptions that can be modified to suit individual cases.

According to the French National Nutrition and Health Program (PNNS), which has based its communications on the 5 fruits and vegetables a day principle, we should be eating five 80-100g portions of fruit and vegetables every day. Taking the average

According to this analysis, we should be eating 500 g of fruit and vegetables a day. For the purposes of our study, let's assume that one of the 100 g portions is fruit, and that the remaining 400 g are vegetables, equally divided between lunch and dinner. A restaurant owner complying with the PNNS recommendations would therefore offer an average of 200 g of vegetables per meal and per customer. For restaurateurs, this table shows the water consumption for a day of 120 covers at a rate of 200 g of washed vegetables per person. This would represent 15.6 kg of tomatoes. The projection can even be made for a 30-day month, assuming the restaurant remains open every day. Tomato consumption over the month would therefore be 720 kg.

Technique de lavage	Deux minutes sous le robinet	Dans une bassine	Economie d'eau réalisée
1 kilo de tomates	24 litres d'eau <sup>1</sup>	2 litres d'eau	<b>22 litres d'eau</b>
15,6 kilos de tomates	374,4 litres d'eau	31,2 litres d'eau	<b>343,2 litres d'eau</b>
468 kilos de tomates	175 219,2 litres d'eau	14 601,6 litres d'eau	<b>160 617,6 litres d'eau</b>

Thanks to these small calculations, we can see that soaking food rather than rinsing it can represent a water saving of 160,617.6 L after 30 days of service for one establishment and for our planet. This just goes to show that everyone can achieve significant water savings on their own scale. Not to mention that this water, which contains no chemicals, could easily be reused for watering, and that restaurateurs are under no obligation to change the water in the basin for every kilo of vegetables.

We can also learn now to cook our food with as little water as possible. Not only does water-saving cooking prevent waste, it also improves health. In fact, according to nutritionist Béatrice de Reynal, cooking without water is the best way to preserve the nutritional properties of food. Short cooking times and low temperatures are also recommended.

And if the cooking water can't be reused to make a dish, as we've already said, you can always act ecologically by pouring it over plants. The plants will then benefit from all the nutrients it contains. The nutrients contained in food are in fact highly soluble in water: when cooked in water, they are mixed with it and therefore lost. Another way to avoid losing them and wasting cooking water is to reintegrate the water into the food.

juice and make a soup or broth, for example. Once again, the chef's imagination and creativity must be at the helm! And once you've got the hang of it, your taste buds will be delighted with this change in the way you cook!

### **Bottled water or tap water?**

In February 2008, the French Ministry of Ecology, Sustainable Development and Town and Country Planning launched the "Choisir l'eau du robinet" initiative. Before encouraging the consumption of tap water, the main aim of this initiative was to raise public awareness of the impact of bottled water on the environment. Indeed, the figures presented were disastrous for our planet.

The market for bottled water is still very strong in France: on average, 8 kg of CO<sub>2</sub> are emitted per 1 L bottle, but above all, 10 kg of waste per person per year are added to the 7<sup>e</sup> continent. Plastic bottled water contaminates the marine fauna food chain.

Some restaurateurs and private individuals choose bottled water because they believe it tastes better and, above all, is pure and healthy. But what's the truth? Are the advantages sold on bottled water packaging really true?

proven? And above all, how does bottled water compare with tap water?

Also in France, tap water is regularly monitored by the ARS, with over 15 million analyses carried out each year. "Drinking water is one of the most closely monitored foodstuffs in France, with tolerated levels as low as a millionth of a gram. Strict standards for its quality are defined in application of a European directive, itself following the guide values of the World Health Organization", explains Marillys Macé, Managing Director of the Centre d'information sur l'eau (Cieau) in her article "What are the quality standards for drinking water? This water comes 62% from groundwater and 38% from surface water: rivers, lakes and other<sup>11</sup> .

Tap water is regularly checked and treated to ensure it meets the 53 criteria laid down by the WHO and the French Ministry of Health. These criteria are divided into different categories:

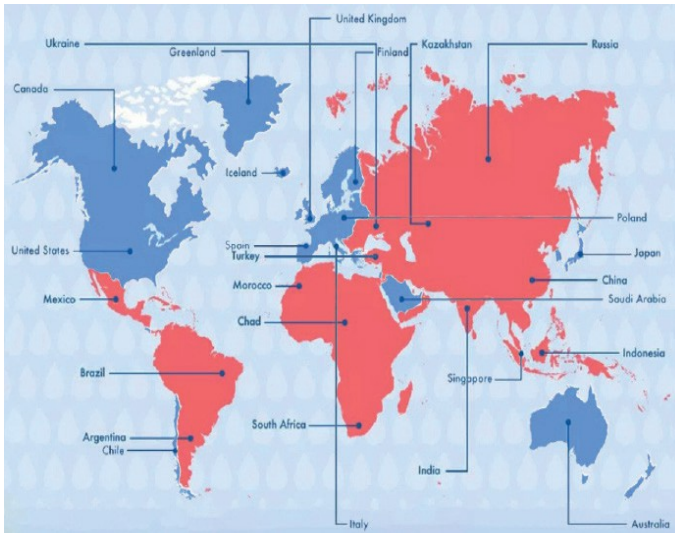
- Organoleptic criteria: color, turbidity, odor, flavor.
- "Unwanted" substances: nitrates, hydrocarbons, etc.
- Toxic substances: arsenic, cadmium, cyanide...
- Microbiological criteria: coliforms, streptococci, etc.
- Physico-chemical criteria: pH, dissolved oxygen,

COD (chemical oxygen demand) ...

- Pesticides and related products: aldrin, dieldrin, heptachlor...

However, water quality is not the same throughout the country. To find out water quality to within 5 km, you can consult the interactive map available on "Que choisir?", the official website of the Union française des consommateurs (UFC). Contrary to popular belief, Paris water is particularly pure. For other countries, we refer you to local official bodies, although we have produced a summary map ourselves to give you an overview.

### Map of countries where tap water is safe to drink (blue) and where it isn't (red):





Countries where tap water is safe to drink :

Andorra, Aruba, Australia, Austria, Bahrain, Belgium, Bermuda, Canada, Chile, Costa Rica, Croatia, Curacao, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Greenland, Guadeloupe, Hungary, Iceland, Israel, Italy, Saudi Arabia, South Korea, Spain, United Arab Emirates, United States, Japan, Kuwait, Liechtenstein, Luxembourg, Malta, Martinique, Monaco, Netherlands, New Caledonia, New Zealand, Norway, Palau, Poland, Puerto Rico, Portugal, Republic of Ireland, Czech Republic, Reunion, Saint Helena, San Marino, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, United Arab Emirates, United Kingdom.

Countries where tap water is undrinkable :

Azores, Afghanistan, Albania, Algeria, Angola, Anguilla, Antigua & Barbuda, Argentina, Armenia, Azerbaijan, Bahamas, Bangladesh, Barbados, Belarus, Belize, Benin, Bhutan, Bolivia, Bonaire, Bosnia & Herzegovina, South Africa, Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, China, Colombia, Cyprus, Comoros, Côte d'Ivoire, Cuba, Djibouti, Dominica, Ecuador, Egypt, North Korea, El Salvador, Eritrea, Federated States of Micronesia, Ethiopia, Fiji, Gabon, Gambia, Georgia, Ghana, Gibraltar, Grenada, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, French Guyana, Haiti, Honduras, Hong Kong, Cayman Islands, Canary Islands, Christmas Islands, Cocos (Keeling) Islands, Faroe Islands, British Virgin Islands, Easter Island, Marshall Islands, Norfolk Island, Pitcairn Islands, Northern Mariana Islands, Wake Island, Solomon Islands, South Sandwich Islands, India,



Indonesia, Iran, Iraq, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Kosovo, Laos, Latvia, Lesotho, Lebanon, Liberia, Libya, Lithuania, Macao, Madagascar, Madeira, Malaysia, Malawi, Maldives, Mali, Mauritius, Mauritania, Morocco, Mayotte, Mexico, Moldavia, Mongolia, Montenegro, Montserrat, Mozambique, Myanmar, Namibia, Nauru, Nepal, Nicaragua, Niger, Nigeria, Niue, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, French Polynesia, Qatar, Central African Republic, Democratic Republic of Congo, Uganda, Uzbekistan, Republic of Macedonia, Romania, Russia, Rwanda, Saba, Western Sahara, Saint Barthélemy, Saint Eustachelles, Saint Kitts and Nevis, Saint Lucia, Saint Martin, Saint Pierre and Miquelon, Saint Vincent and the Grenadines, American Samoa, Sao Tome and Principe, Senegal, Serbia, Seychelles, Sierra Leone, Somalia, Sudan, Sri Lanka, Suriname, Syria, Tajikistan, Taiwan, Tanzania, Chad, British Indian Ocean Territory, Thailand, East Timor, Togo, Tokelau, Tonga, Trinidad and Tobago, Tunisia, Turkmenistan, Turkey, Tuvalu, Ukraine, Uruguay, Vanuatu, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe.

Not only is tap water highly controlled in France, and therefore perfectly healthy, but drinking bottled water is not always advisable for our long-term health. And this, despite a growing mistrust of bottled water in the general public.

In a survey carried out in autumn 2011 at the request of the French Ministry of Ecology and water agencies, 52% of French people said they were very concerned about the quality of their drinking water. According to the 15th TNS Sofres barometer 2010, France ranks 8th in the world for consumption of bottled mineral or spring water, despite a price almost 200 times higher than for tap water.

However, some bottled mineral waters are considered non-drinkable by international standards. Most bottled mineral waters are spring waters with recognized therapeutic properties: recognized by the French National Academy of Medicine, these waters are entitled to the qualification

The minerals and trace elements they contain make them "mineral".

Unfortunately, this higher mineral content doesn't always meet the criteria for drinking water. Indeed, while a course of mineral water may improve digestion or vitality, prolonged consumption can be hazardous to health. For example, water containing high levels of sodium is not suitable for people on a salt-free diet. Plastic particles are another problem with bottled water. Plastic particles are released into the water by heat and light, and their impact on our health is still poorly understood.

Even so, we can assume that they're not good for us or the environment.

To give you a clearer idea of the range of filters available on the market, we've compiled a table listing those most commonly used at home and/or on the move these days, along with their various characteristics. Our list is not exhaustive, of course, and although we'll give you our preferences, as with irrigation systems, everyone must make their choice according to their own needs and preferences.

Filtration types	Benefits	Disadvantages
All types of filter carafes	<p>Better microbial quality than in an unfiltered glass carafe (- 6 CFU / mL after day 7 for filtered water vs. 300 CFU / mL for unfiltered water at the same temperature).</p> <p>The report submitted by INC (2011) indicates that nitrate reductions range from 8 to 17% for cartridges that do not specifically claim to eliminate nitrates.</p>	<p>Chlorine reduction of at least 70% throughout the life of the cartridge, and often higher than the minimum 80% abatement rate recommended by standard NF P 41-650.</p> <p>Metal filtration often lower than that recommended by the aforementioned standard, i.e. 80% for Cu and 90% for Pb over the entire life of the cartridge.</p> <p>Degressive elimination rates :</p> <ul style="list-style-type: none"> <li>- between 11% and 93% at the start of filtration for calcium, but rates drop rapidly and are all below 10% at the end of cartridge life;</li> <li>- for magnesium: decline identical to that for calcium.</li> </ul>
Faucet/showerhead-mounted filter	Benefits	Disadvantages
	<p>Moderate cost.</p> <p>Filtered water is continuously available at the tap, and the device does not need to be changed once installed.</p>	<p>If the filter is not properly maintained, there is a risk of bacterial growth.</p>
Piece of activated carbon (powder, granules or stick)	<p>Removes fine and organic particles, chlorine and pesticides.</p> <p>Dissolves metals such as nickel.</p> <p>Rebalances pH and releases minerals essential to health.</p>	<p>Takes several hours to spin.</p> <p>Increased pH, but no harmful effects are expected.</p>

Filter cartridges	Benefits	Disadvantages
Bationic cationic resins	Resin quality depends on brand, but high anion removal capacity if strongly basic.  Excellent resistance to organic pollutants for low-base resin.	Resin is insufficiently selective with regard to sulfate ions, so it's a good idea to combine it with an activated carbon filter to eliminate as much as possible.  Must be disinfected regularly.
Acid cationic resin	Suitable for all types of water.	Partial elimination of cations at a high initial cost in the case of a weakly acidic resin that can only be used with specific waters.
Silver-treated filter	Low initial cost if resin is highly acidic and completely eliminates cations.  Respects the 25 ug / l limit set by the authors and the draft European standard (2.6 to 13.1 ug / l for 8 cylindrical car- touches).	Although effective, some chemical researchers consider this device to be more appropriate for NGOs than for everyday water treatment[1].
Filter beads	Benefits	Disadvantages
White ceramic (ceramic beads Japanese)	Purify water by removing the limescale, chlorine and other residues (growing success in over 120 countries worldwide).	Lack of scientific studies on the subject, but help to save water when present in a showerhead filter.
Germanium (rare grey-white metal, brittle, with a structure ture is the same as diamond)	Purifies water by neutralizing impurities, germs and residues in tap water. Germanium beads remove limescale, chlorine and heavy metals.	
Red tourmaline	Effectively filters impurities, heavy metals and pollutants contained in water thanks to the porosity of mineral.	

Sources :

- <https://www.anses.fr/fr/system/files/EAUX2015SA0083.pdf>
- <https://unpaspourlaplanete.com/systemes-filtration-eau/>
- <https://www.teqoya.fr/purification-air-filtres-charbon-actif-efficacite-polluants/>
- <https://www.bwt.com/fr-fr/blog/articles/cest-quoi-l-eau-filtree/>
- <https://www.cdiseout.com/bricolag>

ioniseur-d-eau-de-filtre-de-tete-de-douche-de-ge/f-166100109-auc0736561354442.html



This summary table highlighted several elements:

- Activated carbon filters work effectively (and therefore deserve our current enthusiasm for them), but are essentially limited to individual use, as they filter water liter by liter. This Japanese technique is recognized by the scientific community, including the Eau de Paris laboratory.
- Installing a filter system on or under taps and sinks (whether at home or in a restaurant) offers the best value for money, even if the filter on the tap needs regular cleaning to prevent the proliferation of microbes.
- Filters based on pearls and filter stones, such as those found on shower heads, seem to be more effective in saving water than in purifying it, as scientific experiments on this subject are still rare, if not non-existent.
- Filter carafes are practical for everyday use, but require regular maintenance. Their quality varies according to brand and components, and they have a proven degressive efficiency.

Once again, we invite you to form your own experience and opinion on the subject to find your filtering system of choice. And if you don't particularly want to use them, we recommend that you at least stop buying plastic bottles and use tap water and reusable water bottles instead.

for the sake of your health, your wallet and the planet.

### **How can restaurants take concrete action with the Less Saves The Planet label?**

The paragraphs in this chapter have been designed to raise awareness of this crucial issue, and also to explain the path followed by Less Saves The Planet in writing its water charter.

Indeed, it's clear that to choose a product responsibly, you need to know its water footprint, based on the watering used during its growth and its place of origin. Knowing this gives hoteliers, restaurateurs and gourmets the power to take action to save water. It's imperative that hoteliers learn as much as possible about the watering used for their products, and that homeowners adapt this advice to the home. Restaurateurs can also set up their own home-grown vegetable gardens, supplied with water by unfinished carafes, a further eco-responsible gesture for the planet. Less Saves The Planet suggests sparingly using foods that consume more than 10,000 l of water/kg produced, and buying these products according to the table of recommended origins. Organic and regional products are always recommended by the label. Because of its high water content, coffee must be removed from menus.

Staff should also get into the habit of offering customers filtered water instead of mineral water, to avoid the bottled water production chain as much as possible.

*"Man must be nature's guardian, not its owner.*

Philippe Saint-Marc

*"Forests precede peoples, deserts follow them."*

Chateaubriand

## 5 - PRESERVING THE SOIL AND PROTECTING INSECTS

---



### La Terre - Anthem

"She is the earth, she is the plain, she is the field.  
She is dear to all who sow as they walk; She offers a  
bed of moss to the shepherd;  
Frileuse, she warms herself in the eternal  
sun, Laughs, and circles with the planets  
of the sky Like sisters around the hearth.

Harmony is her august work under the heavens;  
She bids the reeds wave, joyous  
And satisfied, the superb tree;  
Because balance is the bottom loving the top;  
For the tall cedar to be within its rights, it needs  
the consent of the blade of grass.

Fierce, she turns an indignant gaze away  
from this sinister plough.  
Murdered, she asks the men: What's the point?

The devastation? What fruit will the desert  
produce? Why kill the green plain?  
She doesn't find the wicked useful, And  
mourns the virginal beauty of fields  
Dishonored in pure loss."

Victor HUGO (1802 - 1885)  
Paris, August 12, 1873.

How do we define the Earth today? The immense planet of the solar system or simply the ground we walk on, our ancestral roots or a new space to conquer, the indomitable power of the elements or rather a land cultivated and mastered by man? Its definition is constantly evolving, and this natural force that has always seemed inexhaustible now seems to be running out of steam. The way mankind defines the Earth illustrates our complex relationship with it. While we sing its praises in poems, we also upset its balance on a daily basis through our lifestyles. As for the earth, while it is "dear to all those who sow as they walk", many people see natural disasters and even new diseases as an indirect message that the earth is infertile, odorless, lacking in diversity and, above all, that it has lost patience with mankind and is asking it for more.  
"Why kill the Green Plain?"

Mother of humanity, fertile, generous and an indefectible support for all living beings: this is what our Earth is, and why we must protect her for as long as possible. Like a nurturing mother who loves and sometimes punishes her children, perhaps she is now seeking to educate and nurture humanity. It is with this conviction that *Less Saves The Planet* today calls on chefs to become its spokespeople, the spokespeople of Mother Earth. Eco-responsible ways of improving are available to us, and it's the restaurateur's mission to be aware of them, to encourage them on a daily basis, and to pass them on to his or her customers. What better field than the food industry to convey messages full of hope and call for change to save our soil and nature?

### **Preserving the earth through sustainable agriculture close to nature**

Soil is a living miracle. In a handful of soil, there are more living organisms than there are human beings on Earth. And we are only just beginning to understand this vast network of living beings beneath our feet. But this efficient balance is also fragile. We need healthy soils for 95% of our food. Yet thousands of years of ploughing, deforestation and erosion have left our soils in a very poor state. And we are only accelerating their degradation. But that's not the end of the story.

## Reintroducing carbon into the soil, the solution under our feet

Global warming is largely due to the emission of greenhouse gases, the most prevalent of which is carbon dioxide (CO<sub>2</sub>). According to the French Ministry of Agriculture and <sup>Food</sup><sup>1</sup>, "the amount of carbon dioxide in the atmosphere increases by 4.3 billion tonnes every year". The dossier "L'énergie de l'agro-écologie, une solution pour le climat" publié par l'Agence de l'environnement et de la maîtrise de l'énergie<sup>2</sup> (ADEME) confirms this figure and explains that

"The atmosphere contains 829 billion tonnes of carbon dioxide, 240 tonnes of which are attributable to human activities since 1750. The largest annual flux is recorded in industrial and urban areas, with 7.8 billion tonnes, plus 1.1 billion tonnes from land-use change and deforestation. These emissions are partially offset by the balance of photosynthesis and plant respiration, and by the dissolution of carbon in the oceans, for 2.6 and 2.3 billion tonnes respectively.

So there is a solution, and it involves reintroducing carbon dioxide into the soil. A number of initiatives have already been launched in this direction, notably by the French government. Let's take a look at these methods.

---

1 - <https://agriculture.gouv.fr/infographic-4-for-1000-carbon-sequestration-in-soils>  
07/11/2017

2 - <https://www.actu-environnement.com/media/pdf/news-22284-sols-agricoles.pdf>, ADEME, 2014

## **What do you need to know about carbon and carbon dioxide?**

To begin with, carbon is a non-metal that constitutes the essential element of organic compounds, i.e. of all living matter. It is only when it combines with oxygen, for example through combustion, that a gas, carbon dioxide (CO<sub>2</sub>), is produced. The properties of carbon and carbon dioxide are therefore quite different, as are their respective consequences for the environment.

So it's not just the proportion of CO<sub>2</sub> in the atmosphere that's the problem, but also the amount of carbon in the soil. These two closely linked issues can aggravate or help each other: it's up to us to act to restore the virtuous circle that originally linked them.

ADEME's dossier "L'énergie de l'agro-écologie, une solution pour le climat" (Energy from agro-ecology, a solution for the climate) explains that currently, even though "the top meter of the world's soils stores between 1,500 and 2,400 billion tonnes of organic carbon", there isn't enough carbon in the soil. Many of the world's cultivated soils have lost more than 50% of their original carbon concentration. The large discrepancy between 1,500 and 2,400 billion tonnes is explained by the fact that carbon is not evenly distributed in the soil. According to ADEME, "the stock of organic matter is high in forests, meadows and high-altitude grasslands, but low in vineyards,



in Mediterranean and arable <sup>areas</sup>3 ". However, in its report on soil carbon sequestration, the FAO recognized the importance of "soil organic carbon", or SOC: "SOC is the main component of soil organic matter (SOM)". As an indicator of soil health, it contributes to climate change mitigation and adaptation, as well as to the achievement of the Sustainable Development Goals (SDGs). High MOS levels provide nutrients for plants and improve water availability. Both improve soil fertility and lead to improved food production.

How does it work? Organisms in the soil - plants and insects - break down organic matter and contribute to its mineralization. Organic matter absorbs and contains numerous elements that are released when mineralized, including elements essential to plants, such as potassium, calcium and magnesium. This process makes the soil much more productive. Organic matter also releases nitrate and phosphate ions, which are beneficial for plants and contaminants for us.) These ions, which are the main cause of green algae, run off into the water if they are not absorbed by plants. However, a sufficiently renewed stock of organic matter retains these ions and leaves them available to plants. What's more, COS improves soil structural stability.

during rainfall by acting as a "glue" which, together with porosity, ensures sufficient aeration and water infiltration, enabling plant growth and limiting the risk of excessive runoff. Carbon-rich soils thus act like giant sponges, absorbing water from floods, which plants will need in periods of drought. The soil's filtration capacity also improves the supply of drinking water.

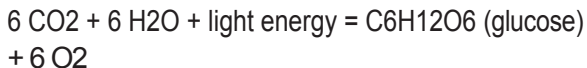
Carbon has important benefits for our soils, but there's another equally important reason for sequestering and conserving it in the soil. As the FAO explains in the same report: "Soils are a major reservoir of carbon. However, soil organic carbon (SOC) is dynamic, and anthropogenic actions on soil can make it a net sink or source of greenhouse gases (GHGs)." In other words, when soil is damaged, it releases carbon dioxide into the atmosphere, with serious consequences that we know only too well: excess carbon released into the atmosphere causes the Earth to overheat, and thus a dangerous imbalance in our various ecosystems. They also acidify our oceans and threaten marine life, as we explained in the chapter on the sea.

However, the carbon reintroduced into the soil solves the pro-

the problem of atmospheric carbon. The key figure in our argument, given by ADEME, is surely this: 1 tonne of stored carbon is equivalent to approximately 3.66 tonnes of captured CO<sub>2</sub>. As we said, the French government has taken a stand on this issue and is calling on all countries to join it in increasing soil carbon by 0.4% per year. If every country managed to reach this ambitious but realistic target, it would be possible to store 75% of the world's annual greenhouse gas emissions in the soil, which could change the future of our planet.

### **How does nature reintroduce carbon into the soil?**

The good news is that we now know how to reintroduce carbon into the soil through photosynthesis. Plants capture CO<sub>2</sub> in their leaves and then pump it into their roots to feed micro-organisms in the soil. This is called photosynthesis. In this process, they use the sun's energy to oxidize water and reduce carbon dioxide to synthesize organic substances (carbohydrates). Nature's fascinating work, however, can be summed up in one equation:



It therefore takes six molecules of carbon dioxide and six molecules of water to synthesize one molecule of glucose by releasing six molecules of dioxy- gene thanks to light energy. The ability of our plants to carry out this process depends on access to sunlight and water, but above all on the quality of our soils, conditioned by the carbon present in the soil.

ADEME points out that "it takes several decades to reconstitute a stock of organic carbon in the soil. It is therefore best to preserve the areas with the greatest reserves and control the artificialization of land". Statistically, a vineyard represents 35 tC/ha, compared with 80 tC/ha for a forest. The quantity of carbon is linked to density and diversity, but also indirectly to the age of the plants. Reforestation is therefore not the optimal solution to counter deforestation. Above all, we need far more photosynthesis from COS-rich soils, black soils, grasslands, peat bogs, forests, etc., as well as from agricultural soils whose biodiversity is preserved.

In agriculture, there are a number of more or less effective practices that can be implemented to increase soil carbon levels. Planting grassed hedges around fields is a first effective solution. Planting trees around crops, known as agroforestry, is even more effective. Grass cover in vineyards and orchards is also an in-

intermediaries. But the most effective means are no-till farming techniques, when the nature of the soil allows, compost spreading and the restitution of crop residues.

We can conclude from all this that, while we still need to reduce our fossil fuel emissions, there's no need to develop costly and risky technologies. Climate change may seem overwhelming, but there is hope. Healthy soil can be a major carbon sink. Until now, we haven't been very well informed: now we know that the solution lies beneath our feet!

### **The benefits of farmer seeds for soil preservation**

We've already touched on the subject of farm seeds in the chapter on water, but we're far from having shown just how important they are! We talked about their survival characteristics, which enable them to grow with very little water, but they are at the heart of many other issues directly linked to our land and our agriculture. As we've said, peasant seeds are seeds that a farmer takes from his harvest or from nature for later sowing, but which, unlike seeds

are generally not commercially available or listed in the official catalog.

The latter was created in 1932 by the Seed Control Committee, and has since been used to control every seed variety, undermining farmers' autonomy and independence. The legislation surrounding this practice has given rise to a number of controversies: it has outlawed seed exchanges between agriculturalists, in the name of regulatory protection of patent ownership, whereas they had been taking place freely for centuries and protected the variety of existing species. After several years of unsuccessful attempts, a law for the reconquest of biodiversity was finally passed in 2016<sup>4</sup>, authorizing the sale and exchange of peasant seeds to amateur gardeners. The liberalization of this practice is advancing<sup>5</sup> as the legalization of the sale of peasant seeds is a hot topic currently being debated right to the heart of the European Commission.

At present, Pascal Poot seems to be the only farmer officially standing up to the seed lobbies - at least, he was presented as such by the experts who came to meet him<sup>6</sup>. He is accompanied in this effort of resistance, so important for the maintenance of our biodiversity, by a number of associations for the defense of the environment.

---

4 - L'édito carré of Monday 22/06/2020 by Mathieu Vidard, Les semences paysannes enfin autorisées, FranceInter

5 - <https://www.novethic.fr/actualite/environnement/agriculture/isr-rse/bonne-nouvelle-les-farmer-seeds-finally-authorized-for-sale-148720.html>

the heritage of our millennia-old seeds, such as Kokopelli and the Réseau Semences Paysannes. Abroad, seed producers like Wild Garden Seed or Peace Seeds in Oregon, and environmental activists like Vandana Shiva, the star of the anti-GMO struggle in India, are defending traditional and organic peasant farming on their own scale.

The history of these seeds is therefore relatively troubled and far from complete. In any case, it is highly indicative of the balance of power that exists when it comes to global food issues. In the European Union, for example, seed certification is supposed to guarantee "varietal identity" (corresponding to the description of the variety given at the time of registration in the catalog), "specific purity and germination capacity" and "sanitary quality" of the seeds, to ensure the absence or minimal presence of harmful organisms. Inspection, crop monitoring and laboratory checks are justified by the need to supervise their commercialization.

In France, the Ministry of Agriculture delegates their certification to the SOC, Service officiel de contrôle et de certification des semences et plants. Official sales must therefore be certified, and the species sold listed in the catalog mentioned above.

However, we are entitled to question the consequences of such legislation, in particular the ban on selling farmers' seeds for commercial use. Everything is being done to disqualify the latter, and this for economic reasons, which have a direct impact on the well-being of our land and the richness of our biodiversity. Extreme restrictions on the sale and use of "non-official" seeds means the promulgation of others, i.e. those sold by Limagrain, Pioneer, Syngenta, Monsanto and Bayer. As a result, regulating the exchange and cultivation of farmers' seeds effectively favors hybrid and genetically-weakened seeds, forms of "silent" GMOs that are fundamentally incapable of growing without pesticides and consistent irrigation. On the other hand, "The result of this selection is that our varieties produce 10 to 20 times more vitamins, antioxidants and polyphenols than conventional or hybrid varieties", as Pascal Poot's website puts it. Their consequences for the Earth are catastrophic, requiring the systematic use of pesticides, causing our soils to suffer and gradually killing off our biodiversity. The documentary *La guerre des graines*, from the YouTube channel *La Télé Libre*, denounces a loss of around 75% of our biodiversity, and the drastic disappearance of insects and animals that originally lived in agricultural <sup>crops</sup> is a visible sign of this. Theses on the spread of



The presence of pesticides in running water is even being discussed and <sup>studied</sup><sup>8</sup>, proving the worrying scale of the phenomenon of natural pollution caused by intensive farming. What's more, these seeds do not have sufficient genetic material to reproduce from one year to the next, and farmers are forced to buy new ones on a regular basis.

Whether we're restaurateurs or consumers, we have everything to gain by not bowing under the weight of the lobbies that control the seed market, and by encouraging as far as possible the dissemination and use of farmers' seeds at our own level. It's also important to promote short production and supply chains, small-scale producers and eco-responsible production centers. By adapting our consumption patterns as much as possible to this reality, we can ensure the survival of certain species that are as beneficial to biodiversity as they are to our health, and bring about changes in agricultural legislation!

*"The cost of protecting the natural environment is much lower than the cost of restoring it. Defending nature is profitable for the nation."*

Philippe Saint-Marc

## The GMO problem

A genetically modified organism (GMO), living modified organism (LMO) or transgenic organism is any living organism possessing a novel combination of genetic material, obtained through the use of modern biotechnology<sup>9</sup>. In other words, a GMO has undergone a human modification of its genetic make-up in order to be endowed with new properties. Certainly the most sensitive debate in the agricultural sector, the controversy surrounding the authorization or prohibition of GMOs raises the question of the ethical limits to the use of modern biotechnology in this field. The cultivation of GMOs is prohibited in the European Union. Yet every year, it imports several tonnes of them, notably Brazilian and Argentinian soya to feed livestock<sup>10</sup>, and of the 64 countries that require products to be labelled "with GMOs", 28 are in the European Union. GMOs thus account for 30% of the global seed market.

Furthermore, in 2018, there were 1.9 million hectares dedicated to the cultivation of additional GMOs, and there were 26 cultivating countries (21 developing and 5 industrialized). That same year, 90.5% of the world's GM acreage was in the USA, Brazil, Argentina, Canada and India.

---

9 - Christophe Noisette, "Brésil : OGM - Monsanto condamnée pour publicité mensongère", InfoOGM, August 28, 2014.

10 - <https://www.lefigaro.fr/flash-eco/greenpeace-denonce-l-addiction-europeenne-au-soja-ogm-bresilien-20190611>

These figures show just how buoyant the GMO market is, despite the existence of legislation against it. The effects of GMO crops are still difficult to quantify accurately, with pro- and anti-GMOs relying on different conclusions and interpretations of the same phenomenon. However, while it is true that GM crops have positive effects, it is also true that some GMO companies sometimes use dubious practices, such as bribes and misleading advertising, to achieve their financial goals<sup>11</sup>. Added to this is the fact that they undeniably increase the use of total herbicides, including glyphosate, which has direct and hardly contestable effects on the environment. Not to mention the ethical debate they provoke. The subject is therefore a delicate one, in which different worldviews have different impacts on biodiversity. Here's a summary of the arguments for and against GMOs. This will make it easier for you to form your own opinion on the subject.

---

206 11 - Christophe Noisette, "Brésil : OGM - Monsanto condamnée pour publicité mensongère", Inf'OGM, August 28, 2014.

Arguments for	Arguments against
GMOs could solve famine problems thanks to their supposedly higher yields and their ability to grow on previously unusable land.	Food safety: the introduced GMO gene may encode a new, allergenic protein.
GMOs have made it possible to develop new drugs, such as insulin, and it would be possible to use genetically modified animal transplants in humans.	While GMOs can reduce the use of insecticides, they are insensitive to herbicides, which can lead farmers to use more than necessary (the same would apply to insecticides, as many insects develop tolerance, or even resistance, to the insecticide produced by the GM plant).
GMOs enable the emergence of varieties with superior characteristics to those of so-called "normal" plants, for example by increasing their nutritional quality (particularly vitamin A for rice).	Impacts on the environment (disruption of the balance of nature, since stronger GMO plants can overtake older seeds, with the risk of wiping them out + genetic "pollution", e.g. the impact of insecticides on bees, or the spread of GMO pollen by the wind or foraging insects).
In addition to having a certain tolerance to cold, heat and salt, some GM plants have been designed to remedy environmental pollution problems (e.g. a poplar genetically modified to clean the soil of heavy metal contamination).	The cultivation of GMOs leads to dependency on the part of farmers: as these seeds are sterile, they are obliged to buy new ones every year (with ever-increasing doses of pesticides).

Ideally, as consumers, we should prefer more natural products, both to preserve our already damaged environment and to avoid potentially disastrous ethical and health consequences. Not all technological progress is good for us, and in this case, our 2,000 years of experience in traditional agriculture remains more reliable than the cultivation and consumption of GMOs, at every level. Getting back to the sources and roots of our food will always be the most beneficial solution. And, to quote Socialist Worker journalist George Monbiot, "the greatest threat to food security on Earth is the concentration of the food chain in the hands of a few rich and powerful players.... By thus seeking to control the food chain through the development of genetically modified organisms, they risk becoming famine-makers in the third millennium."

## **The case of edible oils**

If fruit and vegetables are a major topic in the food debate, let's not forget the importance of oils in the kitchen. In the same way as our table's star products (meat, fruit, vegetables, legumes, etc.), we can learn to choose them well and use them sensibly, so that they too can make their contribution to the common edifice of healthy eating.

"eat better". Currently, over 150,000 tonnes of used edible oils are produced every year in France, across all industries. However, only a quarter of them are collected and recovered. The problem? The remaining 75% ends up in household waste or down the drain: a large quantity of waste that can be recovered or recycled.

Let's take a look at some of the ways in which everyone - restaurateurs and private individuals alike - can reduce their use of oil. Today, a number of products can regenerate frying oils and fats, extending their life and use by 70%. Indeed, after 3-4 days of use, frying oil has legally reached its expiration date. They enable restaurateurs to use less frying oil, thus saving on raw materials and helping to protect the environment. Recycling oil is crucial to preserving the environment.

nement, whether you're a restaurant owner or a private individual. The presence of edible oils disrupts the operation of wastewater systems (clogging, degradation) and diminishes the treatment capacity of wastewater treatment plants by forming a greasy film that prevents air oxygen from penetrating the water. What's more, as they cool and set in contact with water, oils can clog pipes. Not to mention that, because they are non-hazardous biowaste under the French Environment Code, all used vegetable oils must be collected and recycled by approved companies: since 2012, the French Environment Code (Book V, Title IV) and the French Public Health Code (Book III, Title III) have strictly forbidden them to be disposed of with wastewater or mixed with other waste.

A number of government-approved organizations collect used oil in the kitchen, which is then recycled as biodiesel fuel. Several companies also specialize in oil collection and recycling (Veolia, Allo à l'huile, etc., depending on where you live), enabling restaurants to delegate this management.

For private individuals, it's possible to recycle used cooking oil into something useful or decorative. In fact, there are many different ways of disposing of food waste without polluting the environment... and it's perfectly possible to transform your cooking oil into something useful or decorative.

into soap, washing powder or <sup>candles</sup><sup>12</sup> ! Soap is traditionally made from vegetable oil, and there's nothing in the way of home preparation. Cooking oil can also be used to make detergent, ideal for washing floors and clothes.

To show you how easy it is to recycle oil at home, let's take the example of candle-making: simply pour the used oil - previously filtered with a cloth - into a glass jar, add a few drops of essential oil, place a wick on top and you're done! You've recycled your edible oil into a 100% homemade candle!

On the other hand, if you wish to recycle your used oils yourself, avoid using them in your compost, if you have one, as they could slow down the decomposition process by reducing air circulation and attract rodents.

Now that we know we can re-cycle oils, we need to know which ones we can use, and above all what their advantages and disadvantages might be.

Let's start with palm oil, the most widely produced, consumed and sold vegetable oil in the world.

the world. In 2018-2019, global consumption of this cheap product reached 70 million tonnes<sup>13</sup>. In 2014-2015, it accounted for 38% of global vegetable oil consumption, with 80% for food, 19% for cosmetics and 1% for energy production. By 2030, the FAO even estimates that volumes produced will be twice what they were in 2000.

A major ingredient in a very famous spread, it is also a component of many supermarket products, sometimes in very unexpected ways. In other words, the market is booming and still has a bright future ahead of it. However, palm oil has been an undesirable ingredient in the food industry for several years now. The problem is not directly linked to its nature, but to the development of its cultivation in countries where nothing is done to protect the environment. It is recognized as having three main harmful effects: deforestation, which leads to the other two, the disappearance of biodiversity and species, and the increase- ment of greenhouse gases.

WWF has made this one of its major battles and is working to shed light on these undesirable effects, of which it offers a significant overview. It points out that the surface area of palm plantations in South and East Asia, in countries such as Malaysia, which along with Indonesia accounts for 85% of the world's palm plantations, is growing rapidly.

---

13- <https://fr.statista.com/infographie/19534/consommation-mondiale-huile-de-palme-et-reparation-by-use> 211



of global production, increased from 3.34 million hectares in 2000 to 4.86 million hectares in 2010. Since this type of production thrives best in warm, humid environments, it continues to expand, with the tropical forest bearing the brunt of the impact. In the words of the WWF, "an oil palm plantation reduces the level of biodiversity by at least 90% compared to a primary tropical forest <sup>14</sup>". In concrete terms, this ongoing expansion threatens orangutans, elephants, rhinoceroses and other species, some of which are in fact on the brink of extinction, living in a habitat that is increasingly being nibbled away by deforestation. The decline in tree and mammal diversity varies between 90% and 99%.

This expansion also affects local people and their cultures, as they are forced to change their diets and leave their homes when they come into direct conflict with the big palm oil producers. Even if the versatility and productivity of this oil allow for the creation of jobs and the development of a local economy, the situation is far from idyllic in many respects. For its most modest growers, this escape from poverty rhymes with environmental disaster, and the balance is largely unbalanced. The lack of respect for peatlands and ecosystems has contributed to a high release of greenhouse gases into the atmosphere, adding air pollution to soil pollution.

and water. As you can see, all strata of life are affected: in palm oil-growing countries, life in general is in great danger, even though the game is not really worth the candle.

To limit this environmental massacre, we would have to stop consuming palm oil altogether. As certification is still being developed and improved, anyone can check the composition of the food they buy to make sure it doesn't contain palm oil. However, there are producers of sustainable palm oil, which WWF seeks to encourage and promote on the international <sup>scene</sup><sup>15</sup>. Gabon, for example, is one of the countries investing most heavily in this alternative, which should be favored at all costs. But since palm oil is just one of many oil varieties available for consumption, we've compiled a table showing the advantages and disadvantages of each variety. It's up to you to make up your own mind by testing the one(s) that appeal(s) to you! In any case, we recommend that you limit your consumption of processed products, which generally contain a lot of them, and not in a way that is optimal for the body.

	Benefits	Disadvantages
Peanut oil	<p>Peanut oil is one of the few virgin oils suitable for high-temperature cooking. What's more, its high omega-9 content helps prevent the risk of cardiovascular disorders (2)(3). As a vegetable, peanuts are also high in vegetable protein.</p> <p>Thanks to their high protein content, peanuts and peanut oil can replace meat and peas in whole or in part. They can be used for deep-frying, stir-frying, pan-frying and salad dressing.</p> <p>Its neutral taste is suitable for all foods. It can also be used for cooking, as its properties are heat-stable.</p>	<p>Because of its sensitivity to oxidation when heated to high temperatures, it should not be used for frying food.</p> <p>If you are allergic to peanuts, avoid eating them.</p>
Avocado oil	<p>This vegetable oil can be used in cooking, as it contains the same benefits as organic olive oil. Ideal for fried dishes and pastries, it can also be used on bread or salad. Be careful, however, to add the right amount of oil to the ingredients, as avocado can add a touch of acidity.</p>	<p>Avocado oil presents no health risks, provided you don't overheat it and you're not allergic to latex and/or exotic fruits. In fact, avocado oil contains hevein, a component also found in bananas, kiwis and other fruits.</p>
Oil from rapeseed / canola	<p>With its neutral taste, this alimentary oil is nutritionally very complete. It also contains polyunsaturated fatty acids, omegas-6 and omegas-3, which are essential to our health but are not synthesized by the body.</p> <p>"If we wanted to formulate an ideal oil, we wouldn't go far wrong with rapeseed"[1], remarks Dr. Dominique Lanzmann-Petithory. Indeed, it has all the fatty acids in almost ideal proportions and at a modest price (€2.1 for Lesieur's "Fleur de Colza"), almost comparable to sunflower. It is also the lowest in saturated fatty acids (along with hazelnut oil).</p> <p>Does not denature during cooking and can be used for pastries as well as for pan-frying vegetables.</p>	<p>The composition of vegetable oil is strongly influenced by production conditions. To ensure its quality, we recommend selecting a cold-pressed, extra-virgin oil, ideally of organic origin.</p> <p>It's best not to heat it, as cooking removes the omega-3s that are rapeseed oil's main benefits. So it's better to use it in salads or in preparations that don't require cooking.</p>
Palm oil	<p>Good source of nutrients, rich in saturated fats and therefore solid, stable, not very sensitive to oxidation and rancidity, resistant to heating.</p>	<p>Its cultivation is very bad for the environment (as explained in this chapter).</p> <p>Rich in saturated fats, it can raise LDL cholesterol when consumed in excess.</p>

Olive oil	<p>Excellent for your health, thanks to its high content of omega-9 monounsaturated fatty acids. Their consumption is associated with a reduced risk of cardiovascular disease and lower levels of total and LDL ("bad") cholesterol in the blood.</p>	<p>Contains almost no omega-3.</p> <p>Olive oil contains 77% oleic fatty acid, which promotes blood clotting: ingesting too much olive oil can lead to poor blood circulation.</p>
Sesame oil	<p>A uniquely mild and sweet taste, very popular in Asia.</p> <p>Well-known for its dermatological benefits, sesame oil can also be used in a wide range of sauces. It adds a distinctive aroma and sesame seed aftertaste to your dishes.</p> <p>Sesame oil is a "healing oil" in every respect. It is packed with vitamins, such as vitamin E, with its antioxidant properties, and vitamins B1, B2, B3, B6 and B9. It is also rich in minerals: phosphorus, calcium, magnesium, iron...</p> <p>This oil contains sesamo-line and lecithin, which may strengthen nerve and brain cells. Its good fat content also helps lower cholesterol. However, sesame oil consumption should be avoided by children and pregnant women.</p> <p>Choose a virgin, cold-pressed oil, if possible from an organic and fair-trade chain. This way, the product retains all its nutritional properties and natural taste. You'll find it in parapharmacies, biological stores and on the Internet. If you need a cooking oil, unroasted sesame oil is ideal, as it withstands heat better than roasted sesame oil, which is used only as a seasoning.</p> <p>Protected from light, humidity and heat, this oil can be stored for several months.</p>	<p>For certain categories of people, sesame oil consumption should be limited or sup-primed. There are relatively few contraindications, but if you have one or more in the list below they should be taken into account:</p> <ul style="list-style-type: none"> <li>· children's age (up to 1 year);</li> <li>· varicose veins;</li> <li>· kidney disease (stones, sand), gallbladder and liver disease;</li> <li>· high blood coagulability;</li> <li>· tendency to diarrhea;</li> <li>· peanut allergy;</li> <li>· at the same time as taking aspirin / consumption of foods containing oxalic acid (spinach, cucumbers, etc.), because of the risk of urolithiasis</li> </ul> <p>Sesame seed oil should not be taken with acetylsalicylic acid (aspirin) and other drugs containing this substance. If you are allergic to peanuts, this product should be completely excluded from your diet.</p>
Walnut oil	<p>A source of vitamin E and magnesium, it prevents the body from aging. Rich in polyunsaturated fatty acids (67%), it increases intellectual capacity and reduces bad cholesterol levels. It is a very important source of omega-3, which has a protective effect on nerve cells. It also has laxative properties. Keep refrigerated.</p>	<p>Cannot withstand high-temperature cooking because of its high proportion of unsaturated fatty acids. This is why walnut oil is not recommended for high-temperature cooking or frying. It can, however, be used to flavour a hot dish or pan-fried dish at the very end of cooking.</p>

<p>Lins eed oil</p>	<p>Less well-known than other vegetable oils, it is just as interesting. In fact, linseed oil is so high in omega-3 that it has given rise to the term linolenic fatty acid!</p> <p>Its richness in omegas-3 and omega-6, which are invaluable to the body and play an important role in cell renewal, makes it a healthy oil. It has real nutritional qualities, notably in the prevention of cardiovascular, cognitive and inflammatory disorders.</p> <p>It also contains many vitamins, such as A, E, B and K.</p>	<p>Consume only cold and within three months of opening (may become toxic once rancid).</p> <p>Particularly unstable, heat-sensitive and easily oxidized.</p>
<p>Grape seed oil</p>	<p>This oil stands up well to heat, making it ideal for frying. It can also be used to season salads and raw vegetables. Grapeseed oil can also be used in vinaigrettes and homemade mayonnaise.</p> <p>This oil has a particularly high content of mono- and poly-unsaturated fatty acids (73%), essential for the body. Its natural detoxifying and anti-cholesterol properties reinforce its action in the prevention of cardiovascular disease.</p> <p>Grapeseed oil withstands high temperatures without denaturing.</p>	<p>Contested in the vertices and health-promoting properties it is said to possess.</p> <p>Made using polycyclic aromatic hydrocarbons, recognized as carcinogens.</p>
<p>Corn from oil</p>	<p>Corn oil is good for everything, easy to use and appeals to everyone because it doesn't taste like much. What's more, it's easy to conserve. Thanks to its vitamin- and fatty acid-saturated composition, this oil :</p> <ul style="list-style-type: none"> <li>· has a choleric effect and reduces the risk of cholecystitis;</li> <li>· increases the body's resistance to infections, strengthens the immune system;</li> <li>· normalizes the functioning of the nervous system, improves memory and concentration;</li> <li>· prevents the development of cancerous tumors;</li> <li>· has a general reinforcing effect;</li> <li>· normalizes metabolism and helps reduce body weight.</li> </ul> <p>Corn oil is easy to include in your regular diet. It can :</p> <ul style="list-style-type: none"> <li>· contribute to active muscle work and increase the body's overall endurance ;</li> <li>· fight cholesterol plaque and prevent atherosclerosis (clogging of blood vessels with cholesterol deposits);</li> <li>· strengthen the heart and blood vessels and reduce the risk of heart attack and stroke.</li> </ul>	

## The effects of soilless cultivation

Fruits and vegetables of all kinds all year round? A tempting proposition. But at what cost to the planet? Tomatoes, for example, are now available all year round in Europe. But with what gustative value? And above all, what is the risk to the Earth? At a time when almost 70% of tomatoes produced in France are already grown in soilless conditions, this is a subject that merits close attention<sup>17</sup>. In 2003, the world's surface area devoted to crops grown under cover had already reached 1 million hectares, and it has only increased since then.

First of all, let's take a look at hydroponics, or soil-less cultivation, using our example of to-mates: the seeds are placed in small rockwool cubes supplied with water by a drip system. This water is enriched with the nutrients necessary for plant growth (as-similar forms of nitrogen, potassium and phosphorus).

At first glance, the process may seem eco-responsible, since it's very water-efficient: according to the French National Institute for Agricultural Research (INRA), soilless cultivation saves up to 70% water compared with soil cultivation. However, growers must maintain their greenhouses at an average temperature of 22°C. The energy cost of heating and cooling

17 - Les carences cachées de l'agriculture hors-sol et hydroponique," July 2015 (<http://www.environnement-et-energie.fr/>).

in greenhouses cancels out all the efforts made with water. The result is a paradoxically higher energy expenditure than if the tomatoes had been imported from a country where they would have been grown outdoors. Controlling radiation, carbon dioxide content in the air and hygrometry (the study of the quantity of water vapour in the air) further increases this energy expenditure.

From a nutritional point of view, the results are equally impressive. According to a study comparing soilless and field-grown tomatoes, vitamin C levels rise from 20 to 12 mg / kg, polyphenols (antioxidants) from 333 to 200 mg / kg and lycopene (a nutrient) from 89 to 39 mg / kg in soilless cultivation.

The "Less Saves The Planet" menu makes it imperative not to consume fruits and vegetables that have been grown off the land, but only those that are in season. Referring to organic labels that guarantee a link to the soil or, failing that, selecting fruit and vegetables from shelters where the atmosphere is controlled by renewable energies (photovoltaics, heat pumps...) are also good ways of obtaining products whose taste quality is guaranteed and whose growth does not generate greenhouse gas emissions.

## **Crop diversification, the cornerstone of permaculture**

It's time to talk about crop diversification, a major theme closely linked to permaculture. By dint of experimentation, mankind has come to realize that the different plants in an ecosystem work in synergy with each other, and that they can benefit from each other. This is known as "permaculture". In 1970, Australians Bill Mollison and David Holmgren drew on the practices of Japan's Masanobu Fukuoka to define this concept. Today, the agro-ecology dictionary defines permaculture as

"An integrated, scalable cultivation system inspired by natural ecosystems.

This is based on the ability of plants to help each other. It reminds us that knowing one's environment and the properties of the plants that grow there can be invaluable when it comes to farming and respecting biodiversity. In practical terms, this means setting up beneficial companionships in vegetable gardens, with each plant helping the others to grow. All kinds of companionships can be created, depending on the species: all it takes is a little knowledge of vegetable families!

There are many benefits for the planet:

- Preserving the environment and biodiversity.



- Save energy and resources.
- Producing healthy products and therefore healthy food.

If crop diversification is good for the earth, it's also good for plant yields. Many peoples had already assimilated this notion by the 13th century. The Incas, for example, established the so-called "three sisters" association to optimize vegetable harvesting space through a give-and-take between cultivated plants. Their permaculture format placed corn, squash and beans in the same micro-ecosystem, with each of the three components benefiting from the characteristics of its neighbours: squash leaves served as a natural mulch for the corn, which in turn acted as a stake for the beans, which in turn provided nitrogen for the other two.

Here are two tables that summarize the essential information you need to know to start your own permaculture business:

<i>Vegetable families and permaculture associations</i>	
<i>Solanaceae</i>	<i>Eggplant, chilli, bell pepper, tomato, potato, etc.</i>
<i>Umbelliferae</i>	<i>Carrot, celery, chervil, fennel, parsley, etc.</i>
<i>Crucifers</i>	<i>Cabbage, watercress, turnip, radish, horseradish, etc.</i>
<i>Legumes</i>	<i>Beans, lentils, peas, etc.</i>
<i>Lilies</i>	<i>Garlic, asparagus, shallots, onions, leeks, etc.</i>

Blue families get on well together / red families don't get on well together

<i>Four categories of vegetables</i>	
<i>Seed vegetables / pod vegetables</i> (vegetables in which only the inside of the pods are eaten)	<i>Peas, beans</i>
<i>Root vegetables</i> (of which only the root is eaten)	<i>Carrot, parsnip, turnip, radish, beet, salsify, fennel, rutabaga, kohlrabi</i>
<i>Leafy vegetables</i> (of which only the leaves are consumed)	<i>Cabbage, leek, lettuce, spinach, cardoon, ribbed celery, watercress, fennel, parsley, sorrel</i>
<i>Fruiting vegetables</i> (vegetable plant grown to produce fruit)	<i>Tomato, squash, zucchini, cucumber, melon, eggplant, gherkin, bell pepper, chilli, avocado, olive</i>

The basic needs of each species must of course be taken into account when choosing associations (type of climate, soil, irrigation...) and permaculture does not mean compulsive grouping: each plant must have enough water, space and sunlight to grow properly. It's important to remember that, contrary to popular belief, plants in the same family do not have the same needs. Growing umbellifers together, for example, is not necessarily the best option: alternating with crucifers or legumes is preferable to obtain a good association between plants, their needs and properties. Some plants have a short cycle, others a long one: it's also a good idea to mix them to save space while respecting their characteristics.

Last but not least, permaculture is based on the use of only natural fertilizers, no pesticides whatsoever! The aim is to let nature do its work.

## **The dangers of monoculture and the importance of crop rotation**

Here we are, convinced of the benefits of crop diversification and permaculture. However, it has to be said that these methods are extremely difficult to implement. The two major difficulties are sowing and organizing the crops, and ensuring their safety. Through monoculture, the agri-food industry seeks to achieve economies of scale throughout the production process, and guarantee the stability of foodstuffs on the market. But what impact do years of monoculture have on our environment?

The intensive monoculture of soybeans for fodder gives us our first answer: soil <sup>compaction</sup><sup>18</sup>. Soil compaction is literally defined as an increase in soil density when the soil is compressed. In other words, the soil becomes harder and each kilo of soil weighs more when its pores are compressed. This in turn has multiple consequences, two of which stand out for their importance: the risk of roots being hindered and the risk of water transport being reduced. Soil compaction not only hinders root growth and weakens roots, it also reduces water infiltration into the soil. As a result, water accumulates on the surface, preventing soil aeration and water storage in the event of drought, and considerably increasing the risk of soil erosion.

the risk of runoff and even flooding.

What's more, monoculture naturally impoverishes the soil. Each plant requires different quantities of nutrients, yet has the capacity to produce others. The cultivation of a single type of plant over an entire field quickly sucks up the same nutrients, creating an imbalance in the soil that can even render it infertile. Monocultures spread over hectares also threaten bees, as they are likely to feed solely on one and the same type of plant, and thus become deficient. This is one of the causes of the reduced life expectancy of these indispensable insects.

To tackle the dangers of monoculture on a global scale, we need to start by raising awareness of these dangers and introducing crop rotation. Crop rotation, just like crop diversification, can prevent a number of ailments. It's a solution that preserves our soils to a lesser extent. It ensures a better distribution of resources, makes the most of com- post inputs and prevents the development of diseases and pests specific to each crop<sup>19</sup>. An interesting example: in Latin America, soybean cultivation is gradually giving way to a rotation that combines maize (or rice) with another cereal, such as millet or sorghum, or eleusine grass with an intercrop of a forage species, such as brachiaria.

---

19 - FAO, Produire plus avec moins - En pratique : le maïs, le riz, le blé - guide pour une production 223  
sustainable cereal growing, Rome, 2016.

## **Create your own vegetable garden and reconnect with nature**

According to Pierre Rabhi, founder of the Colibri movement, "Growing a vegetable garden isn't just about producing your own vegetables, it's about learning to marvel at the mysteries of life. For those who have the opportunity, creating a vegetable garden has many advantages: it's thrifty and eco-respectful, and it encourages an autonomy that's increasingly necessary in relation to intensive, polluting production circuits.

It's true that, depending on where you live, it's not necessarily easy to set up, especially as it requires maintenance: you can also, more simply, take the habit of buying from market gardeners.

But while the idea of creating your own vegetable garden is very appealing, there are a number of points that need to be taken into account to ensure that consumption is as respectful as possible of the planet. All the information in this chapter is very useful in this respect.

Less Saves The Planet encourages you to select the most appropriate farmers' seeds for your customers and your region, using sales organizations such as Kokopelli, germinance, Biaugerme, Se-

mesh or earthen cycle. Making this choice will save you a lot of unnecessary expense and allow you to consume products that are fundamentally good for you. In addition to choosing the right seeds, a few simple steps, whether you're an individual or a restaurant owner, can also help you adopt eco-responsible habits.

Today, it's perfectly feasible to set up a vegetable patch in your own home or restaurant, or to get into the habit of buying fruit and vegetables from growers associated with this practice. Creating your own vegetable garden is even a civic act, a step towards your own well-being and that of others.

Homemade compost is also accessible to everyone, whether you have a garden or live in an apartment, and will be very useful for your potential vegetable garden projects. It's advisable to alternate waste types (carbon-rich brown waste, such as dead leaves; nitrogen-rich green waste, such as peelings or eggshells; and newspaper-type waste) and to use earthworms to aerate the soil and thus prevent rotting and unpleasant odours. Natural, everyday fertilizers (coffee grounds, eggshells, peelings, banana peels, etc.) are well-known fertilizers that are too often thrown away. In the chapter on the sea, we mentioned that seaweed is also a good natural fertilizer.

## **Favouring legumes in our diet**

The FAO proclaimed 2016 the "International Year of Pulses", with the slogan "Seeds to feed the future". Since then, it has declared February 10 "World Pulses Day" to reaffirm their contribution to sustainable agriculture and the 2030 Agenda. Legumes play a vital role in crop rotation. They are the only plants that naturally capture nitrogen from the air, fix it in the soil and reuse it. In this way, they can increase the amount of nitrogen present in the soils on which they are grown, without the need for additional fertilizers, and promote soil biodiversity.

In temperate zones, the FAO in fact recommends that wheat growers cultivate them to improve soil health and naturally enrich it with nitrogen, thus helping to boost yields. The organization points out that "Grain legumes, such as lentils, which are rich in protein, dietary fiber, vitamins, minerals, antioxidants and phytoestrogens, can be sold to generate income", while "forage legumes, such as alfalfa, can be used to feed animals on the farm".

In addition, growing wheat alternately with vegetables considerably reduces the need to use

fertilizers. In fact, "grain legumes can contribute 30 to 40 kg of nitrogen per hectare to the soil, but legumes grown as green manure or forage for livestock activities store nitrogen much more rapidly and are capable of fixing up to 300 kg of nitrogen per hectare".

Legumes also have a low carbon footprint and moderate water requirements. "Because they have a shorter growth cycle, certain legumes do not draw as much water from the soil as wheat and leave more residual moisture for the benefit of the wheat crop.

In Europe, consumers need to change their attitude to water and remember that it is a "common good" that must be saved. And it is precisely in the food sector that the greatest efforts will be required. The now classic study by the Twente Water Centre, of the University of Twente in the Netherlands<sup>20</sup>, shows that the water footprint of a consumer in the European Union is 5,130 liters per day. In other words, every year he or she consumes a volume of water equivalent to two-thirds of an Olympic-sized swimming pool. This daily consumption is 25% higher than the world average of 3,800 liters per day. Why do European countries consume more water than most of the world?

---

20 - M. M. Mekonnen and A. Y. Hoekstra, The green, blue and grey water footprint of crops and derived crop Products, Twente Water Centre, University of Twente, Enschede, The Netherlands 227



Remember that the water footprint of consumers largely corresponds to a "green water" footprint, i.e., as we explained in the chapter on water, to the water used to grow crops, which in turn are used to :

- human nutrition, as ingredients in the preparation of our food - such as fruit, vegetables, rice, cereals, sugar, oil, flour, pasta ..;
- animal feed, for the production of eggs, cold meats, meat, etc.

On average, 46% of the water footprint of European Union citizens is linked to the production of animal products and 37% to agriculture, which means that over 80% of this water footprint is linked to what is eaten. This means that people consume more water because of the way they eat.

Pulses, which are relatively water-efficient, are also incredibly rich in nutrients. Small but dense in protein - twice as much as wheat and three times as much as rice - they also contain the essential components of a balanced diet. They are rich in micronutrients and B vitamins, as well as folic acid, iron, calcium, magnesium, zinc and potassium. While they are low in calories (260-360 kcal / 100 g dry weight), they are also rich in complex carbohydrates and fiber, which means they are slowly digested and provide a feeling of satiety. Fiber in legumes

are generally not absorbed by the body, thus increasing stool transit and volume. They produce constant, slow-burning energy, while their iron content helps transport oxygen throughout the body, stimulating energy production and metabolism. They can also bind toxins and cholesterol in the intestine for elimination.

Heart health is improved and blood cholesterol levels lowered. For all these reasons, pulses are excellent for cholesterol management, digestive health and regulating energy levels. From a culinary point of view, they lend themselves to a wide variety of combinations, particularly with cereals.

So there's every reason to make them an important part of our diet!

## **What other solutions are available to us as consumers?**

To accompany these culinary gestures, give preference whenever possible to short production circuits: AMAPs, markets, but also buying directly from the producer, preferably organic to avoid any trace of pesticides. Get away from industrial food as much as possible to find seasonal, fresh and minimally processed foods. Try to buy as much as possible in bulk or by the slice to avoid packaging and therefore waste production. In the same way, you can opt for an ecological water bottle or an insulated bag for your meals. To complete this information, here are a few clues to help you recognize organic fruit and vegetables when you go shopping: they are easily re-identified by their irregular appearance. Observe their shape (the fruit or vegetable looks "imperfect"), their size (they are generally smaller than others, with a changing format) or their color (which is not homogenous). Thanks to these simple tips, you should be able to adapt your shopping habits to make them as eco-responsible as possible!

## **Insects, indispensable allies of our environment**

### **Bees, the origin of life**

An indispensable pillar of ecosystems, the bee is currently threatened with extinction. This insect is responsible for pollination, a phenomenon that ensures the survival of 80% of flowering plant species, 75% of food crops and 35% of the world's agricultural <sup>land</sup><sup>21</sup>. By collecting pollen, bees contribute to the reproduction of flowers in the same way as the wind and other animal species (insects, hummingbirds, bats, certain species of lizards, etc.). Part of the pollen sticks to their legs and is thus deposited on the pistil of other flowers, which they gather to produce honey and wax. All bee species, both pollinators and wild bees, are essential to global food production.

Various factors have contributed to the increase in their mortality rate, which now fluctuates between 30 and 35%, and can even reach 50% during the winter period. These include the abuse of pesticides and chemical substances, the effects of monoculture and climate warming, and the proliferation of the Asian hornet and other pests, all of which threaten their livelihoods. What's more, they may be unwittingly responsible for the spread of GMOs in the wild.

GMOs produce their own insecticides, poisoning the bees that gather them. The same is true of plants treated with pesticides, insecticides and fungicides: bees foraging on treated flowers die before even returning to the hive. On the other hand, as mentioned above, the widespread use of organic farming does not poison bees, but rather causes them to starve, because organic farming is too poor to feed them.

In Europe, 30 to 40% of bee colonies have been destroyed in less than 10 years, and the situation could become irreparable and quite simply catastrophic if nothing is done to protect them. For this reason, in 2020, May 20 has been declared "World Bees Day". It has become urgent to draw attention to their plight, and that of other pollinators, and to encourage the authorities to take measures to protect them.

In 2018, American giant Walmart filed a patent for a project to manufacture robot bees in a bid to tackle the disappearance of the species. This invention, similar to the "RoboBees" that Harvard has been working on for several years, could take charge of pollination but also enable the exploration of dangerous areas *via* its mini-camera<sup>22</sup>. Such robots are also at an advanced design stage in Japan. All

It begs the question: why focus on a robotic, deprived version of a naturally efficient species that can still be saved?

The UN suggests that we all do our part to help preserve <sup>bees23</sup>, and these recommendations are also, in the same vein as the Less Saves The Planet charter, aimed at restaurateurs:

- "Keep a diverse set of plants in your garden or on your balcony, even more so if they bloom at different times ;
- prefer to buy raw honey harvested by your local beekeepers (unlike industrial honey, which undergoes no processing or filtering and therefore contains all its proteins, enzymes and trace elements);
- buy products from sustainable farming practices;
- avoid using pesticides, fungicides or herbicides in your gardens;
- protect wild nests where possible;
- sponsor a beehive ;
- leave a clean container filled with water outside, essential for bees after a day spent buzzing;
- support reforestation ;
- raise awareness of this issue by sharing this information with others.

Buying organic honey guarantees the protection of bees, as beekeepers must not use any synthetic products to treat their hives, the wax they produce or the food they feed their bees. The honey obtained is therefore as unpolluted as possible. The bees' well-being is also preserved, as their hives must be placed in a protected environment to qualify for the "organic" label. The specifications for European organic honey are in fact very strict: foraging areas must be at least 3 km away from any source of pollution, such as cities, bees are treated using only natural methods, and feeding other than their own honey is exceptional<sup>24</sup> .

Honey is an imperishable food - in 2014, archeologists found honey over 5,000 years old that was still perfectly safe to eat when <sup>reheated</sup><sup>25</sup> : so don't worry about the expiration date on the jar - it's purely conventional! You can enjoy its antimicrobial and other benefits indefinitely!

By following these recommendations to the best of our ability, which are fairly straightforward once you get used to them, we can all do our bit to preserve the balance of our biodiversity. If we want to continue eating fruit, nuts and certain vegetables, we need to-

As vegetable growers, we need to protect the species that give us access to them.

## **Is integrating insects into our diet a current trend or a responsible choice?**

If there's one food trend emerging today as a result of global environmental awareness, veganism aside, it's entomophagy. This may seem a barbaric word, but it refers to the consumption of insects by humans. Although it has recently become fashionable in the French media, this diet has always existed in certain regions of the globe. According to the FAO, "insects complement the diets of around 2 billion people, [...] mainly in certain regions of Asia, Africa and Latin <sup>America</sup><sup>26</sup>".

More than 1,900 species of edible insects are consumed worldwide, a number that continues to grow as this trend and research on the subject gain momentum. As the FAO report points out, insects are a highly attractive source of animal protein, helping to meet the demands of an ever-growing population. Rich in fatty acids like fish, insects are also full of fiber and trace elements (iron, copper, magnesium, phosphorus, zinc, etc.), all of which combine with a low risk of disease transmission.



zoonotic diseases (including H1N1 and mad cow disease).

In addition to their nutritional qualities, insects offer considerable economic and social advantages: they are very easy to raise, and represent a potential source of income that can be very useful in the fight against poverty, or simply in strengthening developed economies. The investment and expense involved in breeding insects is minimal: in particular, they can be fed with organic waste, and require much less water than conventional farming. To give a more concrete idea of the savings they can bring, it should be remembered that "on average, 2 kg of feed are necessary to produce 1 kg of insects, whereas cattle require 8 kg to produce 1 kg of increased animal body mass<sup>27</sup>". Not to mention the fact that they can be raised in a wide variety of environments, such as a simple bucket, and are therefore not dependent on soil. Their needs/apports ratio is therefore very interesting from a nutritional, economic and ecological point of view.

Once bred, it's just as easy to convert insects into food: some species can be eaten whole, or their proteins can be extracted, or they can be ground into pasta or flour. At present, insect breeding and trans-

---

236 <sup>27</sup> - FAO, "The contribution of insects to food security, livelihoods and the environment", [https://www.concours-agro-veto.net/IMG/pdf\\_1-theme\\_agroalimentaire.pdf](https://www.concours-agro-veto.net/IMG/pdf_1-theme_agroalimentaire.pdf)

We can (and should) personally support the entomophagy businesses and cultures that already exist, on the one hand. We can (and should) personally support the entomophagy businesses and cultures that already exist, on the one hand, and raise awareness and inform those around us about the virtues of this dietary alternative, on the other. The aim is not to compete with other animal product industries, but to develop a pertinent alternative for restaurateurs and citizens in general.

The planet will thank us!

### **How can restaurants take concrete action with the Less Saves The Planet label?**

This dense chapter raised many important points and showed us how to raise our awareness and take action to best safeguard our soils and their ecosystems, or at least avoid encouraging their destruction. As restaurateurs and hoteliers, we have a duty to promote healthy eating, and now more than ever.

We can integrate water-saving products into our menus and promote a new diet, highlighted by excellent preparations.

lence. To achieve this, we need to appreciate, get to know and promote in our kitchens the products of sustainable agriculture that respects seasonality, using the wide diversity of vegetables, legumes, fruits and spices.

So our first criterion is to cook fruit and vegetables in season, according to the climate, preferably organic or regional. This is a sure way of avoiding off-grid cultivation, which is radically banned by the label. Similarly, because of its harmful impact on forests and biodiversity, palm oil is banned. The Less Saves The Planet charter also requires all restaurants to offer only certified organic or European PDO honey. In addition, at least one dish containing this honey must be available on the menu. At our level, let's encourage the development of entomophagy, as it remains a way of eating that respects the Earth and biodiversity.

It's also essential to highlight the productions of farmers whose practices are beneficial, whether it's respect for organic farming criteria, the use of farmer seeds, crop rotation and per-maculture, systematic water saving or the reintroduction of carbon into the soil. When we strive to buy products from sustainable farming environments, checking the origin of products can be a real challenge.

This is particularly true when we do our daily shopping in supermarkets. Apps, such as Yuka, are available to guide consumers in their purchases. This somewhat dense chapter raised many important points about how we can all become aware of and act to best safeguard our soils and their ecosystems, or at least avoid encouraging their destruction.

We're convinced that these small efforts can have a big impact.

*"True wisdom consists in not deviating from nature, but in molding our conduct to its laws and model."*

Seneca



*"Don't look for the fault, look for the cure."*

Henry Ford

## 6 - FIGHTING WASTE

---



In the New Testament, we find the parable of the sower: "A sower went out to sow. As he sowed, some of the seed fell along the path; the birds came and ate it. Another part fell into stony ground where it had little soil; it sprang up immediately, because it didn't find deep ground, but when the sun came out, it was scorched and dried up, for want of roots. Another part fell among the brambles; the brambles grew and choked it. Another part fell into good soil; it bore fruit with a ratio of 100, 60 or 30 to 1. He who has an ear, let him hear.<sup>1</sup> "

One wonders if the modern world still has ears to hear. And whether the meaning of Jesus' parable has not been lost to us like the grain. Like the story of Joseph of Egypt, who had already proposed a way of consumption that limited waste, doesn't this parable have something to teach us? In our

---

1- The Jerusalem Bible, Gospel of Matthew (13:4-9).

Instead of being a scandalous exception, waste has become the norm, a norm accepted by all, and one that nobody is surprised about. Do we know, for example, how much food is wasted?

Recently, we've come to realize that we need to change our mindsets to combat this. In May 2011, on the initiative of the FAO, the Messe Düsseldorf Group (one of the world's leading export platforms) and Interpack (the world's leading trade fair for the packaging and processing industries), international experts from the worlds of politics, business and civil society came together for the first SAVE FOOD Congress. On this occasion, the FAO announced that it was launching a global initiative to raise awareness, coordinate national policies and develop a strategy to combat this scourge.

She also presented a study indicating that "a third of the world's food production for human consumption is lost or wasted, reaching around 1.3 billion tonnes per year, [and that] food is wasted throughout the food chain, from initial production to final consumption by households".

In middle- and high-income countries, food is wasted in large quantities, and sometimes even thrown away while still fit for consumption.

considerable food waste at the very beginning of the food chain. In low-income countries, food loss occurs mainly at the beginning or middle of the food chain, while waste by consumers is much more limited. In the wake of this study, many countries have begun to recognize the problem and to develop legislation to prevent it.

"anti-waste food" campaign.

In France, the law of February 11, 2016 on the fight against food waste relied on a study by ADEME to sound the alarm. This showed that in France, in 2016 "all food losses and wastage, all players and all food sectors combined, represented a mass of 10 million tons of lost and wasted products for human consumption". And ADEME adds: "The carbon impact of losses and wastage is estimated at 15.3 million tonnes of CO<sub>2</sub> equivalent<sup>2</sup>, i.e. 3% of all national activity emissions, or 5 times the emissions linked to domestic air traffic." Although 67% of these losses occur during production, processing and distribution, consumption, whether at home or away from home, is responsible for the remaining 33%. The study also points out that "losses and wastage during consumption account for 42% of the total at the restaurant and catering stage, even though we only eat 15% of our meals there".

---

2- FAO, "Food loss and waste in the world - Extent, causes and prevention", INCOME Consulting, 2012, p. 5; AK2C, "Food loss and waste: the state of play and its management by stages of the food chain - Synthesis", 2016, p. 7 (available online at [www.ademe.fr/mediatheque](http://www.ademe.fr/mediatheque)).



accounts for 13.9% of the total.

In Switzerland, the Federal Office for the Environment commissioned the Swiss Federal Institute of Technology Zurich (ETHZ) to conduct a study on the environmental impact of the food sector in 2019. This work shows that "52% of the environmental impact due to avoidable food losses (Food Waste) is caused by households and the catering sector, 27% by the processing industry and 8% by trade.

Agricultural food production, at the beginning of the chain, is responsible for 13% of the environmental impact, which it generates mainly abroad." Following this study, in March 2019 the National Council in Berne adopted a postulate - the Swiss legal term for a parliamentary report - aimed at implementing measures to lead to a 50% reduction in food waste by 2030. Other countries around the world have taken the same path.

That's why Less Saves The Planet proposes to give back all their value to the products we consume every day, and to apply the "three Rs": Reduce, Reuse, Recycle.

## **Fighting food waste in hotels and restaurants**

When it comes to overall food waste, the catering industry bears a significant responsibility. It is therefore legitimate to ask how restaurants (but also canteens, kitchens for local authorities and businesses, caterers, etc.) can remedy the undeniable impact that uncontrolled waste has on the production of greenhouse gases and global warming. Already, in Europe and the United States, a number of professional organizations, as well as major hotel groups, are taking action on this issue, proposing guides that list the best practices of some of their members or establishments, with a view to proposing them as models for the profession.

Less Saves The Planet has compiled all these recommendations for the various stages of food service work. Our aim, as in previous chapters, is to spread these waste-reducing and even waste-eliminating practices throughout the foodservice sector. For restaurateurs, as well as choosing products that are good for their customers and good for the planet, putting an end to waste is not only an achievable goal, but also enables them to generate profit and project a positive image of their establishment.

"Waste is a real scourge and a reflection of our times: 'buy, consume, throw away' with no concern for the environment.

consequences... Our profession as restaurateurs, our values, are in total contradiction with this scheme! Indeed, if we waste, we reduce our margins. What's more, our knowledge of the true value of foodstuffs encourages us not to waste. So we have to be particularly efficient to ensure the long-term future of our businesses, and to play an educational role with our customers, while limiting the impact of our activity on the environment," explains Roland Héguy, confederal president of the UMIH (Union des métiers et des industries de l'hôtellerie).

*"Sustainable development is neither a utopia nor even a contestation, but the condition for the survival of the market economy."*

Louis Schweitzer

## **A la carte and menu design**

Contrary to popular belief, waste occurs long before products are purchased. In a restaurant, the number of dishes available à la carte or the presence of a buffet determines the amount of waste at the end of the service. The buffet concept resonates with what we said in the introduction about abundance in modern society. The self-service display of large quantities of food gives the illusion of greater freedom of choice. However, it is also a major source of food waste. Visit

The numerous dishes on offer encourage gourmets to try as many as possible. The adage "your eyes are bigger than your stomach" applies. Plates fill up more than they should, resulting in significant waste that is difficult for the restaurateur to recuperate, since the food is already on the customer's plate. What's more, a buffet is a communal space where customers help themselves, sometimes too quickly. A lot of food is therefore lost during service.

Conversely, brunch on a plate is an anti-waste practice that could be widely proposed by restaurateurs. This American concept, which became Anglo-Saxon in the 19th<sup>e</sup> century, has become increasingly popular in France in recent years, and is now very much in vogue. The practice of a rationed brunch represents an interesting opportunity for the catering world in the context of Less Saves The Planet, because it allows people to eat in a balanced and conscious way, while avoiding mechanical overeating and the waste of resources that have not been consumed. This service requires fewer staff and allows for greater appreciation of the food chosen if it is carried out under Low and Slow conditions, i.e. with a preference for plate service rather than all-you-can-eat. In hotels and restaurants, it is therefore possible to combat waste by adopting gestures that, ultimately, enhance the quality of service offered to customers and considerably improve the image of establishments that have adopted them, thereby making a visible and effective contribution,

to combat global warming.

Of course, there are solutions for establishments wishing to maintain a buffet while limiting waste. Offering buffets with 3 starters, 3 main courses and 3 desserts to limit waste not only enables the restaurateur to improve productivity, but also allows customers to enjoy the full flavour of each dish.

In every restaurant, the development of the menu is decisive. The practice of putting forward a menu of the day is developing in many countries, but has not yet become a systematic habit. The menu of the day helps to orient customers while limiting waste. More generally, limiting the choice of starters, main courses and desserts on the à la carte menu is an eco-responsible choice. Technology is also opening up new prospects for eco-responsible restaurateurs: in Japan, many restaurants offer advance reservations for a fixed menu. This gives a clearer picture of the quantities to be produced, and therefore better stock management.

### **Buying products**

Elsewhere in this book, we have emphasized the importance of employee awareness and involvement, optimized water and energy consumption, and a purchasing policy that gives priority to products made from sustainable materials.

seasonal, preferably organic, and which do not jeopardize biodiversity. Beyond the obvious, Less Saves The Planet recommends that restaurateurs develop an anti-waste strategy right from the sourcing stage:

- by staggering orders for non-perishable products (dried vegetables, beverages, etc.);
- by grouping deliveries between colleagues;
- buying in bulk, in large containers or via shuttle packs, to reduce packaging;
- by producing certain vegetables, herbs, etc. on site.

### **Food preservation**

Good product management is then essential in the fight against waste. This involves implementing long-life preservation techniques to better manage stocks and extend product shelf-life. Applying the following seven tips can already drastically reduce food waste:

- Vacuum-packed.
- Installation of a cooling cell.
- Systematization of product freezing, appertizing and canning, etc.
- Check your cupboards regularly (once a month, for example).

- Keep your fridge clean: mold can accelerate food spoilage.
- Do not leave fruits and vegetables in a hot or smoky environment. Natural gas can accelerate the ripening process.
- Use glass containers. Some plastic containers contain chemicals that accelerate the ripening process.

Knowing the difference between the best-before date and the sell-by date is also important for good stock management.

The best-before date (BBD) is indicated after the words "use by", followed by the day and month, on the packaging of microbiologically perishable foodstuffs likely to present a danger after a short period of time, according to public authorities: dairy products, packaged meats and fish, cold meats, fresh ready-made meals, etc. On the other hand, the DDM (date of minimum durability) is indicated on packaging after the words "best before" and concerns packets of dry, salted or sweet cakes, grocery products, coffee, frozen foods, etc. Once the DDM has passed, the product remains shelf stable. Once the best-before date has passed, the product can still be consumed without risk to health, but its organoleptic and nutritional qualities are no longer guaranteed: it may have a different consistency or taste, or lose its mineral or vitamin content. The DDM is therefore a recommendation, not an obligation, for the consumer.

Best-before and sell-by dates are set by health and safety regulations or by the manufacturers themselves.

### **Preserving herbs and condiments**

- Store onions in nylon nets, tying knots to separate them from each other. If they are too damp, they may rot more quickly, so store them in a cool, dark place. In optimal conditions, they can be stored for up to eight months.
- Store garlic away from light and moisture, in a paper bag for example. Store in a cool, dark place. A whole clove will keep for up to two months, while a half-used clove will keep for three to ten days.
- Place parsley, coriander, basil and asparagus stems in a container filled with water and leave at room temperature. Don't wash them until you're ready to cook them.
- Make cubes with coriander, parsley or other herbs: once the herbs have been finely chopped, they can be placed in an ice-cube mould covered with melted butter or olive oil. Simply melt a cube in the bottom of the pan to cook.
- Store roots (ginger or turmeric) in the freezer.



## The ethylene problem

What makes it difficult to store fruit and vegetables properly is their diversity. Because they react differently to external conditions, such as light, temperature and other lesser-known factors, it's difficult for the consumer to know what behavior to adopt.

One of these little-known factors is ethylene gas. This gas is naturally produced by fruit and vegetables and is responsible for their ripening. Initially, it contributes positively to their development, improving their appearance, texture and flavor. It makes our fruit and vegetables edible by eliminating the toxins that enable the fruit to fight infection. Ethylene is even responsible for reducing acid and starch levels in our plants, and increasing sugars.

However, the production of ethylene continues after harvest, in different quantities depending on the plant, and gradually degrades them. It's important to distinguish between the most productive fruits and vegetables and those that are most sensitive, so as to be able to preserve all of them in the best possible way, starting by avoiding mixing them.

Ethylene producers: apples, mangoes, melons/watermelons, bananas, avocados, plums,

grapes, tomatoes and onions.

Those sensitive to ethylene: broccoli, lettuce, asparagus, potatoes, cucumbers or carrots.

### **Preserving vegetables**

- Store potatoes in a cool, dark place. For storage, paper bags or nets are preferable to plastic bags. Avoid the refrigerator, as the cold tends to accelerate the transformation of starch into sugar. This change makes the texture of the potato grainy. The best way to store potatoes is in a crate lined with newspaper: apples mixed with potatoes will prevent them from sprouting, unlike onions, which attract sprouts.
- Leave the peeled potatoes in a container with water and white vinegar. They will keep for four days in the refrigerator.
- Do not refrigerate tomatoes. They should be stored in a pantry or on the counter, as low temperatures cause them to lose their flavor. Tomatoes can be kept from three weeks to two months, depending on their degree of ripeness at the time of purchase.
- Never place cucumbers in the refrigerator, as they deteriorate when cold and also when in contact with water.

ethylene gas.

- Remove tops from carrots: they tend to retain moisture and spoil the vegetable. Once peeled and refrigerated in an airtight container filled with water, carrots will keep better.
- Store lettuce, spinach and cabbage in fresh packaging. After purchase, they should be washed in plenty of water and then dried. Separating the leaves with a paper towel and placing them in a closed container in the fridge will ensure good preservation: any residual moisture will be absorbed by the paper towel, keeping the produce fresh for up to two weeks.
- Place peppers in a paper bag to prevent moisture build-up. Once opened, wrap in paper towel and place in an airtight container.
- Wrap celery stalks in aluminium foil and place in the fridge. Under these conditions, the stalks will be edible for up to a month.
- Store mushrooms in a paper bag with parsley in the fridge: parsley's antioxidant properties prevent staining. Don't wash them before you're ready to cook them, as moisture can spoil them.

- Keep zucchini and eggplants are likely to soften under the effect of cold and humidity. Their flesh may become mealy. The same applies to butternuts and other squashes.
- Store avocados in the open air, as they darken when cold.

### **Preserving fruit**

- Wrap aluminum around banana stems: when ripe, bananas produce ethylene gas, which causes severe deterioration of the fruit, as well as some other fruits. Putting aluminum foil around the stem will prevent the gas from spreading throughout the fruit, and allow it to keep for four or five days longer. Bananas can also be peeled and placed in the freezer in an airtight bag for up to three months.
- Use white vinegar to disinfect strawberries: soaking them in one part white vinegar mixed with two parts water is still the best way to remove traces of pesticides. But they should be cleaned only at the last moment, as the water softens and spoils them. Once cleaned, however, they can be stored for up to four months in an airtight bag in the freezer. When you buy them, take the time to sort them out to remove those that are already spoiled and could damage the others.
- Keep the citrus fruits on the work surface. These will

should be stored out of direct sunlight, at room temperature and in an open space.

- Wrap lemon halves in aluminum foil and/or sprinkle with salt.

### **Refrigerator or pantry?**

For many people, refrigerator storage is as simple as possible, without thinking about the different temperatures in each zone and their suitability for different foods. What's more, we've lost the habit of having our grandparents' traditional "Garde-Manger" at home, which was nevertheless the best storage choice for certain products.

<i>Storage space</i>	<i>Temperature</i>	<i>Products</i>
<i>Refrigerator top: Cold zone</i>	<i>0°C to 4°C</i>	<ul style="list-style-type: none"> <li>- Meat, cooked and cooked meats, poultry, fish</li> <li>- Fresh delicatessen products, creams, fresh and raw milk cheeses, dairy desserts</li> <li>- Defrosting products, opened fresh products,</li> <li>- Fresh fruit juices, packaged salads</li> </ul>
<i>Center of refrigerator: Cool zone</i>	<i>4°C to 6°C</i>	<ul style="list-style-type: none"> <li>- Home-made preparations</li> <li>- Cooked vegetables and fruit</li> <li>- Cooked meat and fish</li> <li>- Yogurts and cheeses made from scratch</li> </ul>
<i>Refrigerator crisper</i>	<i>8°C to 10°C</i>	<ul style="list-style-type: none"> <li>-Washed fresh fruit and vegetables</li> <li>-Packed cheese to finish maturing</li> </ul>
<i>Refrigerator door</i>	<i>6°C to 8°C</i>	<ul style="list-style-type: none"> <li>-Eggs, butter, milk</li> <li>Well-sealed opened fruit juices</li> </ul>
<i>Pantry</i>	<i>Maximum 25°C</i>	<ul style="list-style-type: none"> <li>-Tomatoes, cucumbers</li> <li>- Zucchini, eggplants, squash</li> <li>- Peaches and stone fruit</li> <li>-Melon, watermelon, banana, avocado</li> <li>- Gherkins</li> <li>- Garlic, onion, basil</li> <li>-Eggs</li> <li>-Chocolate, coffee, honey</li> </ul>

Special mention should be made of eggs, which can be stored either at room temperature or in the fridge. However, they tend to absorb odors from the fridge. The most important thing is not to change your storage method.

## **Making the dishes**

We mustn't forget the preparation stage in the kitchen: it's important to limit the quantity of products used at this stage. Less Saves The Planet recommends using the same foodstuff in several recipes, especially vegetable and fruit seeds and skins. If fruit and vegetable skins are also eaten, it's because they are often thought to be full of toxins and pesticides.

"The skin and the part of the flesh below the surface of fresh vegetables are richer in vitamins, minerals, polyphenols, fiber and antioxidants than the flesh itself," says Valérie Espinasse, a micro-nutritionist in Paris. "Pesticides can be found in all fruit and vegetables, even those grown organically (AB), but in much smaller quantities. The ones that contain the most are carrots, potatoes and leeks", she explains.

However, fruit and vegetables are highly controlled in Europe. "Residue monitoring on plants is carried out by the French government. Every year, samples are taken and analyzed as part of programs coordinated at European level. The latest results published in 2020 by the European Food Safety Authority (EFSA) show 95.5% of samples to be compliant for agricultural products.

and 98.6% for AB products. These results show that the overall situation is satisfactory in the European Union, whatever the origin of the produce," reports Jean-Charles Bocquet, Managing Director of the Union des industries de la protection des plantes. Some fruits and vegetables retain toxins more easily, and are therefore less suitable for consumption. However, once washed, fruits and vegetables with edible skins can be eaten without concern.

The dossier "Lutter contre le gaspillage dans son restaurant" ("Fighting against waste in your restaurant") written in September 2015 by the UMIH offers an inspiring picture for chefs looking to give a second life to their products:

<i>Chutes de matières premières</i>	<i>Amuse-bouches</i>
<i>Pain</i>	<i>Chapelure, toast, pudding, pain perdu</i>
<i>Poulet</i>	<i>Rillettes</i>
<i>Légumes</i>	<i>Velouté, mousse, purée, flan, fonds</i>
<i>Fish</i>	<i>Rillettes, soup, fumet</i>
<i>Meat</i>	<i>Parmentier, stuffed, bolognese, terrine, stock</i>
<i>Vegetable trimmings</i>	<i>Syrup, sorbet</i>



## **After service**

Even after the service, there's still time to recycle food! You can resell some, reuse some and donate the rest.

In many countries, doggy bags are already offered to customers as a matter of course. But some governments have chosen to make it mandatory. This is the case in France: law no. 2018-938 of October 30, 2018 for balanced trade relations in the agricultural and food sector and healthy, sustainable food accessible to all (article 62) makes the doggy bag compulsory from July 1, 2021. The Food Law stipulates that restaurants and on-trade drinking establishments must make reusable or recyclable containers available to customers who request them for taking away food or drinks not consumed on the premises, with the exception of those made available as an all-you-can-eat offer. Restaurants selling takeaway food products must use reusable or recyclable containers.

As for dishes that have never been ordered during service, it is of course possible to organize staff lunches, but they can also be resold. Some applications, such as Too Good To Go, offer same-day takeaways at lower cost: interested parties pick them up at the time and place chosen by the restaurant. Flexibility that guarantees

limited management of the application by restaurateurs, and an income, albeit moderate, instead of a complete loss. If, after these efforts, there are still consumable goods left, such as products not yet opened or prepared, there are still two options:

- Go to the Frigos solidaires to drop off food.
- Donate surplus to charity.

Last but not least, certain products that can't be sold, such as coffee grounds and water from carafes, can be composted in a city garden or planter. Organic leftovers from vegetarian dishes can also be composted. Some meat and fish waste can also be used to feed pets. The management and sorting of waste, whether food or non-food (light bulbs, neon lights, batteries, paint cans, glass, plastic, cans, crates, etc.), is also very important in the fight against waste.

## **The ecological and economic impact of Less Saves The Planet precepts in restaurants**

All the tips in this book can effectively reduce waste and help the planet. However, for restaurants in particular, the fight against waste is also a source of real economic gain. "We waste four times more in the catering industry than in the home," says Laurence Gouthière, in charge of the fight against waste.

The Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME) (French Environment and Energy Management Agency) estimates that 130g of waste is generated per guest per meal, compared with 32g by households.

Using ADEME data, let's take a look at the economic and environmental impact of a 50% reduction in waste in a restaurant serving 120 covers a day. In this case, the restaurant would be open 7 days a week, 365 days a year. Our calculations of economic losses are based on data from ADEME, which estimates that a loss of 15 tonnes of product would have an economic value of around 30,000 euros. This figure gives us the following ratio: 1 kilo of food waste is worth at least 2 euros. Let's point out that for the calculation of the water footprint of food waste the explanatory video on the official FAO YouTube channel "Ecological footprint of food waste" published on September 9, 2014 is an excellent source of clear and precise information. It states that waste represents 48% of agricultural land, or 250,000,000,000,000 liters of irrigation and production water wasted. Taking the amount of food wasted, 1.3 gigatons, or 1,300,000,000,000 kilos, the ratio is 1 kilo of food waste for every 192.3 liters of water lost. Similarly, the Too good To go company has calculated the CO2 emissions from food waste based on the 2013 FAO study "Food wastage footprint: Impacts on natural resources". According to them, "every year, we waste 1.3 gigatons of edible food, which

releases 3.3 gigatonnes of CO<sub>2</sub> equivalent (without taking into account changes in land use). This means that 1 kilo of food waste is equivalent to 2.5 kilos of CO<sub>2</sub> equivalent (or 2.53846 kg, to be more exact)".

<i>Economic impact of a 50% reduction in food waste</i>				
<i>Number of meals</i>	<i>Quantity of food waste</i>	<i>Economic loss</i>	<i>Water consumed by waste</i>	<i>eq CO<sub>2</sub> emitted from waste</i>
<i>Customer scale</i>				
<i>1 classic meal</i>	<i>130 grams</i>	<i>26 centimes</i>	<i>25 liters</i>	<i>325 grams</i>
<i>1 meal reduced waste</i>	<i>65 grams</i>	<i>13 centimes</i>	<i>12.5 liters</i>	<i>1.625 kilo</i>
<i>1 year of classic meals</i>	<i>94.9 kilos</i>	<i>189.8 euros</i>	<i>18,249.27 liters</i>	<i>237.25 kilos</i>
<i>1 year of meals reduced waste</i>	<i>47.45 kilos</i>	<i>94.9 euros</i>	<i>9,124.63 liters</i>	<i>118.62 kilos</i>
<i>Restaurant scale (multiplied by 120 place settings)</i>				
<i>1 day of classic service</i>	<i>15.6 kilos</i>	<i>31.2 euros</i>	<i>2,999.88 liters</i>	<i>39 kilos</i>
<i>1 day of service reduced waste</i>	<i>7.8 kilos</i>	<i>15.6 euros</i>	<i>1,499.94 liters</i>	<i>19.5 kilos</i>
<i>1 year classic service</i>	<i>5,694 tonnes</i>	<i>11,388 euros</i>	<i>1,094,956 liters</i>	<i>14,235 tonnes</i>
<i>1-year service reduced waste</i>	<i>2,847 tonnes</i>	<i>5,694 euros</i>	<i>547,478 liters</i>	<i>7,117 tonnes</i>

## **Fighting waste at home**

Consumers also bear a significant share of the responsibility for food waste, since, as we have seen, households account for 52% of the environmental impact of avoidable food loss. It is therefore important that we too, whatever level of the social and economic ladder we occupy, adopt gestures that will ultimately contribute to saving the products we consume and significantly reducing their loss.

For the benefit of our readers, we have compiled a list of best practices proposed by organizations and associations working in this field. This list is by no means exhaustive, but it will help to put households in a good position to reduce their impact on the planet. Their health will also benefit, and they'll have the satisfaction of knowing that they're contributing in their own small way to a good cause. The advice given to restaurateurs applies equally well to private individuals, but there are three in particular:

1. Reasonable conservation and storage of food products
2. Recipes that use all the edible parts of food, including leftovers
3. Meal organization aimed at reducing the size of food portions

## **A more frugal meal**

- Eat from a smaller plate: the meal seems more generous and the food more copious.
- For the same reason, it's better to eat from a flat bowl rather than a very deep one.
- Serve only once and do not refill.
- Force yourself to eat slowly, savouring each flavour, each aroma and enjoying every sensation the plate has to offer, and take care with the presentation. Put your fork down between each bite. If you chew well, you'll feel fuller at the end of the meal.
- Spread food out over the day to avoid hunger pangs, temptations and untimely snacking, by eating three meals and two compulsory snacks a day. A snack is a food intake linked to a feeling of hunger that provides less than 25% of the day's nutritional requirements, which distinguishes it from re-serving or nibbling. A balanced snack contains one or more foods from the following categories: a dairy product (yoghurt, semi-skimmed milk, lightly sweetened fromage frais), a portion of fresh fruit, a cereal product (toast, wholemeal bread, fruit cereal bar), water or tea.
- Choose the most satiating foods that contain protein, fibre and a little fat (such as white fish, wholemeal starches, almonds, eggs, 0% fromage frais and vegetables),

etc.). What they have in common is that they help avoid blood sugar spikes and lengthen digestion time, thus delaying the feeling of hunger. You can also eat a high-protein food (oily fish, eggs, soya, chicken breast, dried beans, vegetables and dried fruit, etc.) as an afternoon snack, rather than fruit, for example.

- Don't forget vegetables, which contribute to satiety, and increase your consumption of fat-free cooked vegetables.
- Prepare a starter for lunch and dinner, accompanied by a light sauce if desired. Soup, in particular, is a good way to start a meal, and the fiber it contains helps satiate appetite, in addition to the undeniable nutritional value of vegetables. And don't forget wholemeal starchy foods (cereal products, pulses), which limit hunger pangs and provide energy in dribs and drabs.

### **What about fasting?**

In the second part of Agni Yoga's book *The World of Fire*, we read: "Don't eat too much, in short, be careful when you eat. Diseases develop more easily in the presence of clogged currents. Observe this also in plants and animals, and you'll see that sometimes they barely recover their health. Scientists should study the diseases that affect all creatures, not just humans<sup>3</sup> .

Therapeutic fasting has been studied since the de-

---

3 - Living Ethics, "The World of Fire, Part Two". Riga, 1934



of the 20th century. Some have demonstrated that short-term fasts help protect normal cells against oxidative stress and chemotherapy, even if they do not protect pre-hensive cancer cells. Others stress the role of periodic fasting in preventing the risk of coronary artery disease in patients undergoing coronary angiography or suffering from diabetes. Others, finally, point to a greater alleviation of chronic pain in patients who have undergone fasting, and note a better lifestyle in fasters in the three to six months following the end of the study.

In many religious traditions, fasting is also an integral part of ritual practice: Christian Lent, Muslim Ramadan, Jewish taanit during periods of mourning, etc. In December 2015, the World Council of Churches (WCC), which brings together representatives of all Christian churches, launched an interfaith initiative to fast as a sign of solidarity with the victims of climate change. The aim was to bring people of different religions together around this spiritual exercise: everyone was invited to fast on the 1st of each month.

This initiative was taken up again in 2018 on the occasion of the opening of COP 24 in Katowice, Poland, by the "Fasting for Climate" organization and around 100 people.

nalities from the worlds of culture, business and spiritual life have signed up: writer Emmanuel Carrère; philosopher Dominique Bourg, of Lausanne University; president of Secours Catholique, Véronique Fayet; climatologist Jean Jouzel; writer and journalist Jean-Claude Guillebaud; Dominican theologian Éric Tillet de Clermont-Tonnerre ; the abbot of the Zen Buddhist monastery of Weiterswiller in Alsace, Olivier Wang-Genh; the dean of the Faculty of Theology at the University of Lille, also a Dominican, Caroline Runacher; the professor of philosophy of law in Luxembourg, Johan van der Walt; and the philosopher Jean-Marc Ferry...

It's interesting to read their motivations: "Fasting for the climate means seizing the opportunity to reflect on the way we live in the world and to decide on concrete changes in our lifestyles (choosing, for example, to eat, travel or consume wisely). Fasting together means bringing together men and women from all walks of life, whether they belong to a church or not, whether they are activists or not, around an ancestral practice and a common identity: inhabitants of an overheated world, in resistance to fatality and in hope for change to benefit all. Fasting for the climate is a way out of the fascination of disaster, a testament to the human capacity for change and solidarity with our own species and the world around us, and a way of encouraging governments to make climate issues the focal point of their policies.

Whether it's a hunger strike or a spiritual practice, fasting is a way of looking inward, while at the same time opening up a higher dimension that takes us out of our daily lives, punctuated mainly by meals. Breaking out of this routine gives us the opportunity, on an episodic basis, to reflect on more fundamental issues than satisfying our primary needs. Beyond its benefits for our health, fasting leads us to consider the benefits that sobriety could have for our planet and our own species, and even to realize that, ultimately, our collective survival depends on it.

For this reason, as an extension of our Low and Slow practices, we strongly recommend fasting from time to time, both to purge our bodies of all the excesses that contribute to the deterioration of our health, and to become aware, through this spiritual exercise, of our dependence on our planet and the need to re-establish, through a new-found sobriety, its fundamental balances. But we leave it up to each individual to decide whether or not to adopt this fundamentally personal approach. The priority for every restaurant owner and consumer is above all to reduce food waste at every stage where they can, through the accumulation of small, easy-to-adopt habits.

## **How can restaurants take concrete action with the Less Saves The Planet label?**

Less Saves The Planet's charter sets out the fundamental principles of the fight against waste. The first principle remains, as we have seen in this chapter, the doggy bag. For good stock management during supply and service, limiting the menu to 5 starters, 5 main courses and 5 desserts is another fundamental tip proposed by this charter. Similarly, the mandatory "brunch à l'assiette" (brunch on the plate) should enable restaurateurs to take concrete action on their losses. Last but not least, the tips on food preservation and preparation concern all staff, in the kitchen and in the dining room: everyone is invited to apply the right gestures at their own level.

*"The little we can do, the very little we can do, we have to do it."*

Théodore Monod



*"In everything nature does, she doesn't do anything suddenly."*

Jean-Baptiste de Monet

## 7 - THE LOW AND SLOW CONCEPT

---



We've always been fascinated by the Japanese tea ceremony, or chanoyu. It was developed in the 20<sup>th</sup> century by tea lovers who aspired to give a more spiritual dimension to the enjoyment of their favorite beverage. At the same time, it's part of a refined, reduced-to-essentials aesthetic derived from Zen Buddhism, known as wabi-sabi. The ceremony itself follows a highly codified ritual, with the use of utensils appreciated both for their beauty and for their symbolic significance, within a sacralized space devoted exclusively to it. The behavior of the tea master and each guest is dictated by a precise etiquette that erases social differences and places everyone on an equal footing. In this atmosphere, the tea ceremony transcends the purely gustatory dimension and encourages participants to reach out to one another, making each encounter a unique one, according to the famous adage of this Japanese art: *Ichigo ichie*, "Once in a lifetime"<sup>1</sup>.

---

1- Pierre Rival, *Tea for dummies*, First, 2017

This ceremony made a strong impression on Jesuit missionaries in 16th-century Japan, who compared it to the Last Supper and the sacrament of the Eucharist. In his *Spiritual Exercises*, St. Ignatius of Loyola, founder of the Jesuit Order, also proposes a spiritual approach to food. He suggests a number of highly original ideas: the simplest is to take a piece of food and enjoy it, focusing all one's attention on the act of eating, thus stopping the incessant flow of thoughts that usually occupies us. It's a question of being attentive to our body and its movements, of becoming aware that we are chewing, tasting, smelling... By concentrating on the essential in this way, man frees himself, without even realizing it, from the stream of thoughts and preoccupations that never ceased to assail him before. This new focus on the pleasure of eating means that nothing is done in a hurried, confused or chaotic way.

Yet we can see that today our ability to concentrate is eroding: the flow of information has become constant due to portable screens that are always at hand. According to a global study conducted jointly in 2018 by Internet marketing agency We Are Social and social network management tool Hootsuite, we spend an average of 3 to 4 hours a day, depending on the country, just consulting social networks. That's why we think it's important to revisit the way we eat. The approach we

préconisons aims to restore its initiatory dimension, a dimension that already existed in Antiquity with banquets and continues today in Japan with the tea ceremony.

We've called this new concept "Low and Slow". "Low" because our thoughts are at low frequency: to better appreciate the olfactory and gustatory experience of the meal, we need to lower the frequency of our brain waves. "Slow" because such a meal is a parenthesis that gives each guest the opportunity to take a journey into another dimension: concentrating and mobilizing all our attention on the act of chewing to appreciate the flavors and juices contained in each dish. The flow of thoughts, usually dispersed, is directed and concentrated on the single act of eating, according to one of the great principles of Buddhism. That's why we should only talk about the food, its taste and origin. At the same time, we need to slow down the pace of our lives, to avoid multi-tasking and multi-tasking: slowing down, to avoid turbulence in our brainwaves. Doing too many things at the same time is bad for the brain, whereas doing one thing at a time allows us to experience life to the full.

We offer hotel and restaurant owners the chance to put



to implement and exercise this mastery by showing their customers how to eat better, while taking into account the imperatives we have detailed in the previous chapters. Eating better, not simply by paying attention to the choice of food, but also by rethinking the way you behave at the table and the very act of bringing a fork to your mouth. This revision could be a source of inspiration for many. Because, as we all know, gastronomic quality alone is no longer enough to distinguish one establishment from another. The best have reached such a level of excellence that it's becoming difficult for them to stand out from the pack and demonstrate real uniqueness. Even in haute cuisine, there's a risk of failing to stand out from the crowd.

### **Applying the Low and Slow method**

It's up to restaurateurs and hoteliers to invent the uses and forms that this Low and Slow meal ceremony can take, and to do so creatively, since the essential thing is to enable every guest to experience authentic *agape*. It must respect the new constraints imposed on our food by the urgent need to safeguard our planet, while enabling us to improve our health and rediscover our inner wealth. Eat less, eat more slowly, aware of the symbolic and even metaphysical dimension of the act of eating,

it's the path to wisdom. Less Saves The Planet proposes to rediscover the pleasure of taste and moderation through Low and Slow.

Here's how to put it into practice:

1. A space dedicated to Low and Slow

A secluded area should be set aside for the meal ceremony, away from the constant hubbub that usually prevails in restaurants.

2. Soothing background music

Give preference to so-called white noise, i.e. natural sounds such as those of the sea, a waterfall or the rainforest. They provide a sense of security and relaxation, and also help to muffle background noise to prepare the guest for what's to come.

3. A charter and a master of ceremonies

Provide guests with a small sheet of paper containing a few simple rules - which should be more playful than directive - in the style of a meditation charter, such as that used in the tea ceremony. These rules must be explained by a master of ceremonies, who can be either one of the guests present at the table, or a maître d'hôtel trained by the restaurateur to take on this role.

Once settled into this auspicious setting, guests are invited to put themselves in the right frame of mind.

Here are some general recommendations to get you started:

- Cut the link with your phone. There are applications that allow you to disconnect for the duration of a meal. The aim is to combat nomophobia, the excessive fear of being separated from one's cell phone, which scientists have formalized by the acronym FOMO (Fear of missing out);
- Let go of your problems and bad thoughts;
- Avoid unnecessarily stressful or irritating topics of discussion, the aim being to avoid being emotionally tested in any way;
- Learn to chew more slowly by closing your eyes: take at least three mouthfuls before reopening your eyes to fully appreciate the aromas and flavours of the dish you are tasting;
- Drink only after each mouthful to prolong the tasting moment;
- Communicate / exchange on taste, textures, flavours and food origins;
- Be in the present moment, with full awareness.

Let's take a closer look at the four steps we suggest you take during a Low and Slow meal. These rules are easy to follow and will enable you to take full advantage of the dynamics and spirit of this method. As a guest, all you have to do is take a few obvious steps and learn to function differently,

adopt the right attitude for the duration of a meal, which can become, in a way, a real initiation to the true pleasure of eating.

Here's what the restaurateur, or rather the master of ceremonies, will tell you:

1. Clear your mind and free it from external distractions

To begin the experiment, it's essential to separate yourself from your phone. Too often, we eat our meal while doing something else at the same time: reading or working or driving or looking at a screen. When you eat, on the contrary, we invite you to do just that, cutting out everything else, and to leave room for meditation. For this, silence may be necessary. You must not be disturbed by conversation.

2. Look at your plate

Sit down with the food in front of you, and look at it. Note its colors, its shape, its texture. Smell it. This plate has more to offer than just nutrients. Like a work of art, it also feeds you impressions, a set of emotions aroused by its beauty and chromatic balance. Taking the time to assess the nature and quantity of the food present helps the brain to become truly aware of what it is eating, and enables you to feel satiety more quickly.

3. Taste slowly and concentrate on your meal  
It's an innate human reflex, similar to that of an infant suckling at its mother's breast: closing your eyes when you have food in your mouth rapidly reduces the flow of thoughts. To make your taste more attentive and receptive to flavours, close your eyes. By freeing your mind from the distractions of hearing and seeing, you'll get a better feel for the nuances of a dish. Once your mind is free of external distractions, you can enter what's known as extreme focus. Bite by bite, put the food in your mouth and savor its taste and texture. Is it crunchy, soft, grainy, syrupy? Is it earthy, sweet, floral, salty, spicy, tangy? Does it taste of oak, lemon, grass, herbs, moss, tannin? Take the time to chew, swallow each mouthful and pause before taking the next. Take a breath. Enjoy the time you've been given.  
To reap the full benefits of this experience, repeat the process with three different bites-size pieces, taking your time before communicating again with the other guests.

4. Take it in turns to share your feelings with the people you're with. You need to talk only about your plate to stay in the experience. Like a bundle, your thoughts should lead to one and the same subject. Think nutrients

what this food brings you, how it nourishes you and how it was produced (its history, the region it comes from, etc.). What emotions does this dish arouse in you? Does this food remind you of a past experience or a person? This Low and Slow meal will be complete if you repeat each of these four steps for the starter, main course and dessert.

### **The discovery of extreme focus**

"As seeds are the seeds of fruit, our thoughts are the seeds of our future," Emmet Fox.

For our balance, it's important that we know how to reduce and induce our mental flow. From the moment we wake up to the moment we go to bed, we are invaded by 90,000 to 130,000 thoughts that overwhelm us and make us forget who we are. All spiritual currents offer their followers methods for concentrating, meditating and ordering their thoughts, avoiding dispersion, devitalization and loss of attention. These methods were systematized in the 1960s by American psychologists working in marketing and education, as well as in military research. How do you get people to plan their tasks, set their priorities, avoid procrastination, give each action they undertake their undivided attention and focus on the job in hand?

This method for reducing the flow of thoughts

to concentrate on the essentials is called "extreme focus", and this is what we propose to apply during the Low and Slow meal. Guests are invited to behave as if they were taking part in a ceremony that demands their full attention. As we said, no distractions, no cell phones, and conversation focused solely on the dish they're eating. For this reason, we propose that the same dish be served at the same time to all guests around the table.

To reinforce this extreme focus, sensory isolation is required during each bite: close your eyes, remain silent, meditate after swallowing. All this gives diners a new perception of the meal: it becomes a quasi-mystical experience which, by multiplying the value of what they are experiencing, projects them into another dimension. Buddhist monks call this dimension "enlightenment". It's reached by dint of practice.

### **The benefits of Low and Slow**

Eating according to the Low and Slow method has many benefits:

- food is better when you pay attention to it;
- taking the time to enjoy healthy foods helps us learn to appreciate them better;
- eating less makes you feel lighter;

- eating more slowly improves digestion;
- Drinking less helps avoid all the problems associated with overindulgence.

But, more generally, practice Low and Slow:

- reduces stress and anxiety;
- makes us more serene and enables us to appreciate the present moment;
- our joy and love for those who share this moment with us;
- brings out our natural benevolence through the sharing of food;
- enables us to show compassion for those who grow and produce these foods.

### The environmental risks of FOMO and digital flows

By encouraging us to leave our phones and screens behind when we eat, Low and Slow is also good for our planet. Because, even if we don't always like to hear it, it has to be said: while we're enthusiastic about digital technology and its advantages, it's taken us a while to realize that these technologies also have a severe environmental impact, and that their use must be moderated if we are to remain consistent with our desire to reduce our carbon footprint.



Endlessly posting photos of dishes on Instagram, uploading videos, letting messages accumulate in our mailboxes without ever deleting them are all ways of consuming energy without any real use. The servers where these documents are stored, the cloud, all this parallel universe has a cost. In a recent report, the French think tank The Shift Project shows that 4% of greenhouse gas emissions come from the digital sector, and that this share could double by 2025, notably due to the increasingly massive storage of online videos. In 2020, the coronavirus crisis demonstrated the consequences of overloading Internet servers. This event is likely to accelerate digital flows, in particular by leading to a more widespread and intense practice of telecommuting, and thus worsen the impact of digital technology on the planet.

We are therefore invited to show sobriety and restraint in our use of networks, because in this area, as in that of food, less saves the planet. In other words, little things save the planet, and our daily digital consumption is part of what every individual can do to limit global warming and protect the environment.

## **Kindness and respect**

The fear that our societies will collapse as a result of global warming, "collapsology", all these hauntings and terrors are today leading some extremist groups to carry out radical actions. Since 2018, in France, in Lille (Nord), Jouy-en-Josas and Saint-Arnoult (Yvelines), but also in Fontenay-sous-Bois (Val-de-Marne) and Épinay-sur-Orge (Essonne), not forgetting Montpellier (Hérault) or Marseille (Bouches-du-Rhône), the "anti-speciesist" movement has vandalized butcher's shops and restaurants because they offered meat or dairy products. The attacks were denounced by the French Confederation of Butchers, Butchers, Delicatessens and Caterers (CFBCT). Similar movements of "vegan terrorism" are taking place in Great Britain, the United States and even Russia, with varying degrees of virulence. By targeting professions close to the catering industry (farmers, butchers) and favoring direct, violent action over dialogue, these groups are helping to create a climate of chaos rather than contributing to the search for solutions. "Red goes green": today, neo-Trotskyites are seeking to appropriate environmental causes.

Less Saves The Planet is opposed to this violence and radicalization. On the contrary, we need to unite our efforts and work together to combat global warming, and we are convinced that we can do so.

that there is still time to act. Despite many difficulties, humanity has become aware of the urgency of climate change. The necessary measures are beginning to be taken, as demonstrated by the action we have taken to involve restaurants and hotels.

Furthermore, it's impossible to talk about the environment if we don't feel good for our fellow man. If our hearts are filled with anguish, remorse and stress, which drive us to extreme and negative solutions, as we see with certain extremist groups, we can only aggravate the evil. To be truly environmentally aware, we must not only remain benevolent, but also welcome and respect others.

The experience of Low and Slow is fundamental to this logic, because it presupposes the abandonment of any desire to dominate and impose one's convictions by force. As the Supreme Pontiff writes in his encyclical letter *Laudato Si'*, "it is important to assimilate an old teaching, present in various religious traditions, and also in the Bible. It is the conviction that 'less is more'. Indeed, the constant accumulation of consumer possibilities distracts the heart and prevents us from evaluating each thing and each moment. On the other hand, being serenely present to each reality, however small, opens up many more possibilities for understanding and personal fulfillment.

Christian spirituality proposes growth through sobriety and the ability to enjoy with little. It's a return to simplicity that allows us to stop and appreciate what's small, to give thanks for the possibilities life offers, without becoming attached to what we have, or saddened by what we don't have. This means avoiding the dynamics of domination and the simple accumulation of pleasures<sup>2</sup> .

We invite you to try our yoga-food protocol and see for yourself that it's worth the effort!

*"Nature is eternally young, beautiful and generous. She possesses the secret of happiness, and no one has been able to take it away from her."*

George Sand



*"If I were told the world was going to end tomorrow, I'd still plant an apple tree."*

Martin Luther King



## 8 - The label

### *"Less Saves the Planet*

---

#### About the movement

Faced with the current climate situation, it would seem that we can only be discouraged, but we have tried to show through this book that there are many opportunities for change. The aim of this movement is to restore hope and encourage change, in the manner of the Amerindian legend of the Hummingbird:

One day," says the legend, "there was a huge forest fire. All the animals, terrified and dismayed, watched helplessly as the disaster unfolded. Only the little hummingbird was active, fetching a few drops with its beak to throw on the fire. After a while, the armadillo, annoyed by this ridiculous agitation, said to him: "Hummingbird! Are you crazy? You're not going to put out the fire with those drops of water!" And the hummingbird replied, 'I know that, but I'm doing my bit.'"

The Less Saves The Planet movement strives, along with

It's the result of in-depth reflection on the environment and the economy by two international experts in the sector: Fadi Joseph Abou and Flavio Bucciarelli. It is the fruit of a profound reflection on the environment and the economy led by two international experts in this sector: Fadi Joseph Abou and Flavio Bucciarelli. This reflection led them to create a non-profit organization in 2017, whose main objective is to mobilize key players in the hotel and restaurant industry to save the planet. Their contribution is necessary and the aim is to encourage them to set an example to help consumers change their eating habits, and more generally their lifestyles, in order to reduce the planet's ecological footprint. Restaurants and hotels are key influencers. They influence our consumption patterns and can, de facto, become the mediators of sustainable and realistic environmental change. This movement aims to be democratic and humanist, and is open to all.

Through various tools, including this book, but also a website, conferences and a certification system, Less Saves The Planet is committed to helping restaurateurs and hoteliers around the world orient and manage their establishments in such a way that they can, on their own scale, positively influence the entire food chain, for the good of our planet. You'll find a list in the "Our friends" section of our website. And this

This is why Less Saves The Planet certification is aimed at professional establishments as well as their customers.

The Less Saves The Planet label is featured on their menus. Once again, the entire procedure is detailed on our website. It provides a systematic and comprehensive overview of the movement's approach and recommendations in terms of sustainable development.

It also aims to distinguish and highlight establishments committed to this virtuous approach. The book *Less Saves The Planet* is freely available on our website. Based on data verified and validated by world-renowned organizations, this guide helps restaurateurs, hoteliers and, ultimately, their customers in their ecological transition, by helping them to rethink the way they are, eat and live. It provides each of these audiences with a simple, effective *modus operandi*.

*Less Saves The Planet* is a citizen's manifesto, without borders or discrimination. With advice accessible to all, it gives everyone the chance to become an effective player in the fight against global warming and to take action to save the planet.



## The Less Saves The Planet logo

The Less Saves The Planet logo, which appears on maps or menus and which you may have seen at the very beginning of the chapter, may be accompanied by the following explanatory text:

"The Less Saves The Planet logo on this menu is your guarantee of an excellent, healthy and balanced meal, all ingredients of which have been cultivated with respect for the great balance of nature and harvested or raised in such a way as to help safeguard biodiversity. Our establishment is also designed to avoid waste and reduce our carbon footprint as much as possible. It is a 100% sustainable development establishment. Our aim is to offer you a unique culinary experience, while enabling you to join us in the fight against climate change. If you are a restaurant or hotel owner and would like to add this logo to your menu, free of charge and easily, please contact us. We'll then be able to certify you, promote you via our social networks and follow up with you. "

## The benefits

Adopting the Less Saves The Planet codes is beneficial on many levels:

### Benefits for plant managers

- Reduce your operating costs by cutting your consumption of water, energy, waste, etc.
- Enhance your company's public image by becoming an active player in the fight against global warming.
- Build customer loyalty by guaranteeing a healthy lifestyle and sustainable commitment
- Develop your customer base by setting yourself apart from the competition
- Enhancing creativity in the kitchen by changing chefs' habits
- Motivate and rally your teams around a unifying project
- Preparing for future legislation by investing in the future
- Open up to innovation and future opportunities
- Attracting tomorrow's foodservice players
- Become an ambassador for the movement by conveying and training in development values

## sustainable

- Obtain international certification to give your establishment added visibility

## Wellness

- Reducing portions - in particular, not exceeding 130 g of animal protein per meal - is good for your health and helps you discover and learn how to eat without stress and with greater peace of mind.
- Eating without stress and with serenity thanks to the practice of Low and Slow allows you to learn to better appreciate flavours and provides a feeling of satiety.

## Environmental benefits

- Reduce the environmental impact of your business
- Contribute to the collective effort to combat global warming
- Preserving the planet's resources by protecting its ecosystem

## Join Less Saves The Planet, a concrete effort for the planet

Today, the average restaurant serves 220g of meat per plate. Reducing this portion to 130 g of meat, as we are recommending, may seem derisory. And yet, by reducing meat intake by 90g per meal, or 40.9%, we also reduce greenhouse gas emissions, water and plant consumption, and deforestation. The impact on the environment is real. Here's why.

Livestock farming has serious environmental consequences. With this in mind, let's return to the reduction in meat consumption that we're advocating: from one 220 g portion to one 130 g portion per meal. What impact would this reduction of 90g of meat per plate have on air, water and land? What would be the consequences for the environment if demand for meat fell by around 40%?

We set out to calculate it. For this theoretical analysis to work properly, we have defined the following postulates:

- All restaurants serve a single 220 g dish of farm-raised beef to all customers
- Individuals eat two meat meals a day
- The reduction from 220 g to 130 g, i.e. 40.9%, is rounded off to 40%.

- Restaurants serve an average of 120 covers a day, 7 days a week, 365 days a year

Here are the results we obtained in the four tables below:

### Livestock farming, animal feed and deforestation

In addition, livestock land and farmland on which products intended solely for animal consumption are grown account for 76% of agricultural land, or 3.3 billion hectares. This total area is equivalent to the surface area of the United States, China, Australia and the European Union combined. Farming to feed and graze livestock is therefore the leading cause of deforestation. WWF Switzerland estimates that 1 kg of farmed beef represents 323 m<sup>2</sup> of land, including fodder.

Impact of 130g of meat on deforestation and land use	
Quantity of meat produced per year in the world	Space required for agriculture and breeding
Consumer scale	
1 meal at 220 g	64,6 m <sup>2</sup>
1 meal at 130 g	41,99 m <sup>2</sup>
Difference	22,61 m <sup>2</sup>
1 year at 220 g	47 158 m <sup>2</sup>
1 year at 130 g	30 652,7 m <sup>2</sup>
Difference	16 505,3 m <sup>2</sup>
Restaurant scale (multiplied by 120 place settings)	
1 day's service at 220 g	7 752 m <sup>2</sup>
1 day's service at 130 g	5038,8 m <sup>2</sup>
Difference	2 713,2 m <sup>2</sup>
1 year service at 220 g	2 829 480 m <sup>2</sup>
1 year service at 130 g	1 839 162 m <sup>2</sup>
Difference	990 318 m <sup>2</sup>

## Animal feed and water consumption

The calculation of the water footprint of cattle farming, as we saw in the chapter on water, is also the subject of debate: for the federation of breeders and farmers, it oscillates between 20 and 50 l eq-H<sub>2</sub>O / kg, while some studies claim that it is around 15,000 l / kg. We have explained that this colossal figure is in our view the most accurate, since it takes into account not only the water drunk by the animals, but also that consumed on the farm and at the slaughterhouse, as well as that needed to grow the cereals used to feed them. The water footprint of livestock farming is therefore around 15,000 l / kg. Similarly, one kilo of animal meat requires much more food than it provides. For one kilo produced, that's 13 kilos of cereals and 30 kg of hay, i.e. 41 kilos.

Impact of 130g of meat on the amount of water used for animal feed		
Quantity of meat	Water consumption for beef	Average water consumption cattle, sheep, pork, poultry
<b>Consumer scale</b>		
1 meal at 220 g	3,391.3 liters	1621, 84 liters
1 meal at 130 g	2,003.95 liters	958, 36 liters
Difference	1,387.35 liters	663.48 liters
1 year at 220 g	2,475,649 liters	1,183,943.2 liters
1 year at 130 g	1,462,883.5 liters	699,602.8 liters
Difference	1,012,765.5 liters	484,340.4 liters
<b>Restaurant scale (multiplied by 120 place settings)</b>		
1 day's service at 220 g	406,920 liters	194,629.8 liters
1 day's service at 130 g	221,880 liters	115,003.2 liters
Difference	185,040 liters	79,626.6 liters
1 year service at 220 g	148,525,800 liters	71,039,877 liters
1 year service at 130 g	80,986,200 liters	41,976,168 liters
Difference	67,539,600 liters	29,063,709 liters



Impact of 130g of meat on the production of plants for food use animal	
Quantity of meat produced per year in the world	Quantity of plant products required to breeding
Consumer scale	
1 meal at 220 g	9.02 kilos
1 meal at 130 g	5.33 kilos
Difference	3.69 kilos
1 year at 220 g	3,292.3 kilos
1 year at 130 g	1,945.45 kilos
Difference	1,346.85 kilos
Restaurant scale (multiplied by 120 place settings)	
1 day's service at 220 g	1,082.4 kilos
1 day's service at 130 g	639.6 kilos
1 year service at 220 g	395,076 kilos
1 year service at 130 g	242,844 kilos
Difference	152,232 kilos
Difference	161,622 kilos

## Greenhouse gas emissions

We explained in the chapter on meat that, while calculating the amount of CO<sub>2</sub> emitted by livestock farming is controversial, we validate the figure given by the FAO, which estimates that the carbon footprint of cattle farming worldwide is 46.2 kg eq-CO<sub>2</sub> per kilo on average.

Impact of 130g of meat on the quantity of eq-CO <sub>2</sub> emitted	
Quantity of meat consumed	Eq-CO <sub>2</sub> emitted
<b>Consumer scale</b>	
1 meal at 220 g	10.164 kilos
1 meal at 130 g	8.346 kilos
Difference	1.818 kilo
1 year at 220 g	7,419.72 kilos
1 year at 130 g	6,092.58 kilos
Difference	1,327.14 kilos
<b>Restaurant scale (multiplied by 120 place settings)</b>	
1 day's service at 220 g	1,219.68 kilos
1 day's service at 130 g	1,001.52 kilos
Difference	218.16 kilos
1 year service at 220 g	445,183.2 kilos

Without eliminating meat from the diet, but simply by reducing the meat portion to 130 g per meal, a consumer can save 1.818 kg of greenhouse gases, 1,387.35 l of water, 3.69 kg of vegetation and 22.61 m<sup>2</sup> of farmland and livestock. This is proof that everyone can act and "do their bit". The figures presented in these tables are the result of simple calculations based on verified data from reliable sources, such as the FAO and ADEME. Naturally, they do not take into account all the factors necessary to be rigorously accurate. The aim is to give a concrete idea of the impact that chefs and individuals who make the effort to limit their meat consumption could have.

From now on, we'll be taking you through some concrete examples of Less Saves The Planet menus, which we hope will inspire you, whether you're a restaurateur or an individual.

*"Never doubt that a small number of willing, thoughtful citizens can change the world; in fact, it always does."*

Margaret Mead



INTRODUCTION OF A "MENU TYPE"  
**LESS SAVES THE PLANET**



LESS SAVES THE PLANET,  
GASTRONOMY FOR THE  
ENVIRONMENT

## **LESS SAVES THE PLANET : everything is still possible!**

We invite you to learn now how to eat well while saving the environment. We follow specific codes and principles that have an immediate and positive impact on the preservation of our beautiful planet.

Each product has been carefully selected:

- our meats, of controlled origin, respect animal welfare,
  - our fish and seafood products are sustainably caught and farmed, preserving our marine ecosystems,
- we favor seasonal cereals, vegetables, legumes and fruit whose production and cultivation consume the least water. We systematically save water in all our operations, from soil to plate,
- we offer you the choice of no more than 130g of animal proteins per menu and per dish for the good of the planet and the good of our planet.  
your health,
- food waste is one of our priorities through several internal initiatives, so don't hesitate to ask for your doggy bag.  
on the way out,
- we protect bees by promoting organic or PDO honey to encourage pollination and the survival of bees.  
ecosystem preservation .

The book *Less Saves the Planet* can be viewed at

[www.less-saves-the-planet.com](http://www.less-saves-the-planet.com)

**FOLLOW US**



[less.saves.the.planet](https://www.instagram.com/less.saves.the.planet)



# HOTEL METROPOLE

MONTE-CARLO

## Environment and Gastronomy

### Getting started

La Piissaladière

\*\*\*

### Eggplant

en cavilar with crunchy young vegetables and huile d'olive du pays  
2009 Vin de Pays des Bouches-du-Rhône, "Le Grand Blanc" Revelette

~

### Artichoke

roasted and creamy, topped with a cappuccino of pois chiches  
2009 Vin de Pays des Bouches-du-Rhône, "Le Grand Blanc" Revelette

~

### Le Rouget de Roche

acidulated with tomato and thyme fondue  
2009 Vin de Pays des Bouches-du-Rhône, "Le Grand Blanc" Revelette

~

### La Poulette Fermière

en cocotte with candied Menton lemon and mashed apple  
2012 Vin de Pays des Bouches-du-Rhône, "Le Grand Rouge" Revelette

\*\*\*

### The Fig

poached with spices, blackcurrant sorbet and Métropole honey sauce  
D.O.C.G. Conegliano Valdobbiadene Prosecco Superiore, "Canah" Perlage

\*\*\*

### Le Fin Moka

bilo and its Monegasque macaroons

-----

Hôtel Métropole Monte-Carlo  
Dinner on Wednesday, September 19, 2018

*All our breads are made by our baker in our own workshop.*



HÔTEL DES TROIS COURONNES  
&  
DESTINATION SPA

## Menu Less Saves The Planet

**Potagère de légumes moches, céleri onctueux parfumé aux agrumes**

"Hässliches" Gemüse, cremiger Sellerie parfümiert mit Zitrus

Vegetables salad, celeriac foam perfumed with citrus

\*\*\*

**Colorful local chard tortellini with autumn truffle** Farbige Krautstiel-

Tortellini und Herbststrüffel

Swiss chards tortellini and autumnal truffle

\*\*\*

**Gambero Rosso, intense fennel and small shellfish**

Gambero Rosso, Fenchel und klein Muscheln

Gambero Rosso, intense fennel and shellfish

\*\*\*

**Farm poultry with olives, artichokes and glazed cardoons**

Geflügel mit Oliven, Artischocken und glasierte Kardone

Farmer poultry flavoured with olives, artichokes and glazed cardons

\*\*\*

**Pomme & Poire de nos vergers et fruits du mendiant**

Apfel & Birne aus unserem Obstgarten und Trockenfrüchte

Pear and apple from our orchard, and beggar fruit

Friandises / Feingebäck / Delicacies





# HOTEL DES BERGUES

GENÈVE

A FOUR SEASONS HOTEL

## Menu

*Tomates de Genève & eau du Lac*  
*Martial Facchinetti (Four Seasons)*



*A tribute to the earth*  
*Causa Limena & beet declension*  
*Cecilia Zapata (Pachacamac) & Marc Ramade (Chef Consultant)*



*Valais white asparagus tartlet Warm gambero*  
*rosso shrimps*  
*Virgin olive oil from Goutatoo Chefs*  
*Philippe Bourrel (Le Richemond) & Jean-Marc Bessire (Le Cigalon)*



*Organic veal shank from*  
*Piedmont Cooked at low*  
*temperature 18 hours Artisanal*  
*risotto with Amalfi lemon Vegetable*  
*farandole*  
*Fabrizio Domilici (Starling) & Enzo Da Rosa (Café de la Place)*



*Pan-fried cherry, verbena sorbet*  
*Jean-Marie Roger (Four Seasons) & Lenaïc Jourdre (Ritz-Carlton Hôtel de la Paix)*



*Strawberries, strawberry juice with aged balsamic vinegar, olive oil ice cream*  
*Jean-Marie Roger (Four Seasons) & Lionel Rodriguez (Hôtel des Trois Couronnes)*



## Wine selection

*Baccarat Brut Blanc de Blanc, La Cave de Genève,*  
*Switzerland Viognier, Clémence, La Cave de Genève,*  
*Switzerland, 2018 Les Passionnés, Infini, La Cave de*  
*Genève, Switzerland, 2019*



**THE ALPINA**  
GSTAAD

Bhute ke kebab / Mutter aloo tikki

Punjabi Samosa / Paneer Amritsari

by Franz Faeh, Gstaad Palace



Cassoulet from Saanen valley mushrooms

by Nik Buchs, Restaurant 16



Guinea fowl liver / suckling pig / Öster rice /  
mountain cheese / red scampi / mojito foam /  
cucumber

By Marcus G. Lindner, Le Grand Bellevue



Poulard breast / with black truffle /  
roasted onions / mashed potatoes /  
truffle jus

by Martin Göschel, The Alpina Gstaad



Dessert "The Alpina"



*"The world hates change, yet it's the only thing that has allowed it to progress."*

Charles F. Kettering

## What they say

---

A number of leaders and personalities from the hotel, restaurant and media industries have already lent their support to "Less Saves the Planet". Here are their statements:

Jean Claude Ribaut, culinary journalist,  
*Le Monde*

"A sudden awareness of biodiversity suggests that our societies intend to spare raw resources, the gifts of nature preserved by what we call ecology. It's in the success or failure of an approach like 'Less Saves The Planet' that our destiny will be decided."

Agathe Godard, reporter,  
*Paris Match*

"It was with great enthusiasm that I agreed to be the ambassador of "Less Saves the Planet", the foundation of Fadi Joseph Abou, who had the innovative idea of federating the hotel and restaurant world with a project that will really help save our planet."

Alain Angenost, culinary journalist,  
Blog gilles Pudlowski, "Potins Gourmands" blog and  
journalist Less Saves the Planet magazine  
"Co-written by Fadi Joseph Abou and Flavio Bucciarelli,  
*Less Saves The Planet* is a book that sets out to make the  
case for the laissez-faire laissez-faire attitude, so that  
society can be mobilized. It shows us that growth and  
climate can be reconciled by each and every one of us  
acting intelligently, so that the future of the next  
generations is paved with hope and not despair."

Pierre Rival, writer,  
Wine and food editor of *Citizen K* magazine  
"I share your commitment to the environment, and this book  
is written for catering and tourism professionals who want  
to go even further in the fight to save our planet."

Louis-Olivier Maury, publisher, food critic, influencer  
"Of all animals, man is the most inclined to go to  
extremes.  
The trial should be  
To young and old alike. There is not a soul alive  
Who does not sin in this. Rien de trop n'est un  
point Dont on parle sans cesse, et qu'on n'observe  
point." Jean de La Fontaine

The wise writings of the past retain all their flavor,  
and now it's up to us to preserve our future without  
being overly greedy. *Less Saves The Planet* is  
not a fable, but a movement.

A topical ethic within everyone's reach, which, through gastronomy and its players, will enable us to safeguard our planet for generations to come, through sensible solutions.

Pierre Marcel Favre, publisher, critic, journalist,  
Éditions Favre

"I was very impressed by the initiatives of Less Saves The Planet. All the studies today prove that we have a great interest in improving our diet, making the right choices, for the right products, to keep our bodies and minds alert!"

Paul Piccarreta, Editorial Director, *Limite*  
magazine

"Who says big changes can't come from the top? With "Less Saves The Planet", Fadi Joseph Abou challenges leading restaurateurs to realize, without further delay, that they are in the best position to bring about major ecological change."

Katia Kulawick assante, lifestyle author  
Vanity Fair

"We're all looking for ways to do our bit. Individually, we sometimes feel we have very little influence. The Less Saves The Planet initiative proposes a global movement that can easily spread to professionals and an international clientele. To quote Commandant Cousteau: "We need to change our reasons for being, we need to produce more in quality instead of trying to produce more in quantity. Wisdom

pushes us to simplify our lives. Dont act."

Jean-François Hesse, General  
Manager Agence Transversal

"I'm 100% behind Less Saves The Planet, a movement created by Fadi Joseph Abou. Everything is still possible to save the planet.

Through their charter, they aim to mobilize the hotel and restaurant industry to manage their establishments in an eco-responsible way.

In this way, they indirectly raise public awareness of the need to live more healthily, and become players in this essential change.

Pierre Chausse, President,  
Éditions Première  
Partie

"Like my friend Yann Arthus-Bertrand, I'm convinced that the real ecological conversion will be spiritual rather than political. It is through initiatives like those of Fadi Joseph Abou, and the Less Saves The Planet movement, that everyone is called upon to rise above themselves to respect creation. In the field of haute gastronomy, Fadi reminds us of the story of Joseph, patriarch of Israel, and takes with him the greatest chefs to follow the path of happy sobriety. Bravo to Fadi and his team for their benevolent energy that helps us change the world."

Georges Marsan, Mayor of Monaco

"The Monaco City Council, which is concerned about and respectful of its environment, and in accordance with the wishes of H.S.H. Prince Albert II, has for several years been committed to working alongside the Monaco Government.





in a commitment to the environment and sustainable development.

As Mayor, it's my duty to encourage initiatives aimed at raising awareness or taking action, which are important and necessary. Gastronomy in the service of the environment, through major players in the hotel and catering industry, is one such initiative, and is today a key to success, thanks to simple, easily applicable actions whose impact, I'm sure, will be manifest. *Less Saves The Planet* gives us hope for the future of our planet.

Jean-François Liess,  
Pillivuyt France

"As we're keen to provide solutions to the disposable consumer society, we're supporting the work of *Less Saves The Planet* in order to provide a solution adapted to the hotel and catering world, which I know well."

Prince Jean D'Orléans, First Dauphin of France

"I'd like to salute Fadi Joseph Abou and Flavio Bucciarelli for their efforts to promote ecological conversion in the luxury hotel and restaurant sector. I knew Fadi through his famous Al Ajami restaurant, which showcases Lebanese gastronomy a stone's throw from the Champs-Élysées. I discovered him in a different light during a wonderful evening in Monaco, where he appeared to me as a militant of integral ecology. Based on the story of Joseph in the Old Testament, which serves as an exergue to this little book, he leads us into a profound reflection on our responsibility in the face of environmental degradation caused in particular by our diet.

Integral ecology places people at the heart of

the environment to be preserved. There can be no true ecology without concern for human development and dignity. The excellence of our French gastronomy is a treasure that must be preserved in a spirit of ecological responsibility. The kings of France have always supported great cuisine, and I'm happy today to be able to support the "Less Saves The Planet" movement, which has already been joined by our greatest chefs."

Prince Leka II, heir to the Albanian throne

"The Less Saves The Planet vision is a provocative and ingenious way to find a simple approach to environmental protection and sustainable development in the hospitality sector and beyond; raising awareness and pioneering new practices and models by example. It brings a new meaning to quality over quantity!"

Their Imperial Highnesses Imre and Kathleen of Habsburg-Lorraine, Archduke and Archduchess of Austria

"Less Saves The Planet is a movement that manages to combine pleasure and responsibility! Fadi Joseph Abou and Flavio Bucciarelli have convinced us that it's possible to eat responsibly, protecting the environment in which we live while enjoying a varied and tasty diet. We wish this movement for the planet every success in ensuring that these values are passed on and applied by as many people as possible."

Count Vincent-Francois de Riberolles

"Does the ecological emergency condemn us to a sad and tasteless world? Fortunately not. Fadi Joseph Abou's initiative reminds us that preserving our common home raises the question of how to live in it better. Far from despairing, Less Saves The Planet offers suggestions for hoteliers and restaurateurs, so that everyone's greed can play a positive role in changing the way we consume and behave."

Tim Weiland, general manager,  
Hotel Alpina gstaad

"Too often, luxury and sustainability are seen as contradictions that act as opposing forces in high-end hospitality. At Alpina gstaad, we see it as our duty not only to show our guests that the two can be combined, but that the results can create an even richer experience for everyone involved. We were won over by Fadi's passion and are proud to be considered ambassadors of this noble cause."

Pierfranco Lavra, Catering Manager, Hotel  
Alpina gstaad

"I'm honored to have known Fadi and Flavio, two visionaries of our generation committed to promoting simple, concrete food. I truly believe that with their help through the Less Saves The Planet movement, it is possible to raise awareness of sustainable development and respect for our planet."

Martin Rhomberg,  
Four Seasons Regional Vice President and Director of the  
Four Seasons Hôtel des Bergues, Geneva

"At the Four Seasons we believe that life is richer when we get closer to nature and the people around us.

At Hotel des Bergues - a Four Seasons hotel - we're committed to sustainable luxury, and we're convinced that true luxury today is the time we have to communicate with the people we care about.

Therefore, we proudly support Fadi Joseph Abou and Less Saves The Planet, trying to help him with our contribution to ensure that nature as we know it today is still there for future generations to enjoy."

Patrick Raingeard, Michelin-  
starred chef, Hôtel le Cap  
Estel

"For me, it's impossible not to pay attention to planet earth. For a very long time now, I've been concerned with the resources of local and nearby products, so that the children of today and tomorrow can have a real larder of healthy products for their future. We have riches all over the world, and it's imperative that we preserve and safeguard them so that future generations can enjoy them in a gastronomic way".

Serge Ethuin, general manager,  
Hôtel Métropole Monte-Carlo

"For more than ten years, the Hôtel Métropole Monte-Carlo has been implementing an environmental policy aimed at

to reduce the impact of its activity on the planet and preserve biodiversity. It was this shared commitment that led to our exceptional meeting with Fadi Joseph Abou and Flavio Bucciarelli, the energetic and inspired promoters of the "Less Saves The Planet" project. Today, we are very proud to have hosted the first edition of this event, to which I wish a very long and happy continuation, and which will have my full support in its future initiatives."

Jacques Le Divellec, starred  
chef Le Bocuse de la Mer

"We hear about evolution every day, but that's a mistake. We should be talking about transformation. Nature is no longer evolving, nor is humanity. They are transforming. Nature has been asking us to do so through its destructive actions over the last few years. She's asking us, humanity, to transform ourselves to be healthier. Healthy in our nutrition, healthy in our actions and healthy in our production. Industrial groups want to impose their choices on us for our health, but above all for theirs. NO, let us make our choice, let us adapt to a new rhythm, and "Less Save The Planet" is a solution, not by imposing but by suggesting a consumption of only 130g of protein per meal. What an idea! It doesn't impose any restrictions on our food choices, just a reduction in our quantities. Wow, what a great idea not only for our health, but also for reducing world hunger. To conclude, the numbers 1, 3, 0 are suggested by the 7 and then the 8 as a result, what more could you ask for?"

Pierre Ferchaud, general manager,  
Hôtel de Paris, St Tropez / Voted best gM in Europe by its  
peers

"I would like to express my admiration and gratitude  
to my friend Fadi Joseph Abou, for his deep and sincere  
vocation to contribute to the defense and protection of the  
planet. The generosity that drives him, the personal  
energy he deploys so that

"Less Saves The Planet" is generating a series of  
concrete actions with regard to the treatment of all food  
sources, with regard to the daily behavior of professional  
players, are admirable...

I hope that his model will inspire new vocations to  
save our planet.

Michael Smithuis, general manager & regional,  
vice-president of Fairmont Montreux Palace.

"With almost thirty years' experience in the luxury hotel  
industry, I have always supported sustainable  
development and all related programs. At Fairmont Le  
Montreux Palace, we are actively committed to local  
sourcing, diversity, water, energy and waste management.  
I'm therefore very proud to also join "Less Saves The  
Planet" and wish Fadi Abou and Flavio Bucciarelli every  
success."

Éric Bouchenoire, Executive  
Chef, Groupe Joël Robuchon

"Many thanks to "Less Saves The Planet" for your  
confidence. The evening organized at the Métropole  
Monte-

Carlo was exceptional. Joël Robuchon's cuisine was showcased in the service of the planet.

Chef Stéphane Coco,  
Joel Robuchon Group Morocco

"I support Less Saves The Planet! Eating 130g of meat or fish per meal is enough for everyone's well-being, and it has a considerable impact on the planet. We all need to make an effort, and we'll soon see the results. I'm counting on you."

Chef Michel Roth, Chevalier de la Légion d'honneur,  
Bocuse d'or, MOF  
President Wilson Hotel

"Gastronomy is an art, but also and above all a way of living and appreciating the benefits of our nourishing earth. Transmission is one of the essential prerogatives of the chef's profession, and the Less Saves The Planet movement is totally in line with this. Let's teach future generations right now the importance of the environment and the best way to preserve it by eating better and more sensibly: it's fundamental for the future".

Hieu To, general manager,  
Warwick Reine Astrid, Lyon

"Through this book, I have discovered an approach that is so easy for a hotelier/restaurateur to apply on a daily basis, allowing him or her to contribute to preserving our planet before it's too late."

Benjamin Moury, assistant director of Food and Beverage,  
Four Seasons Hotel des Bergues

"Together we can guide the savoir-vivre towards responsible eating that will retain all its flavors! Let's reinvent luxury hospitality and preserve our planet for our children's future! Less Saves The Planet!

Lionel Rodriguez, F&B manager at Baron Tavernier's  
deck hotel restaurant,  
Hotel le Baron Tavernier

"My commitment through my culinary creations is daily. The Environmental Menu leaves more room for the fruits and vegetables that surround us. The state of our planet is our responsibility, and through gastronomy and food we are a lever for the Less Saves The Planet cause. So together, professionals and enthusiasts, let's make the future a hope."

Charl lie Cacheux, Executive  
Chef, Royal Plaza Montreux &  
Spa

"I realized some time ago that to change the world, I first had to change my habits. Our first action for the planet is on our plate [...] On the scale of a hotel establishment, the stakes are considerable and the impact of our commitment just as beneficial. [...] It's a virtuous circle in which each person is a link, supporting the other in his or her positive approach. [...] It's no longer possible, on a global scale, to continue eating the same way. Slow vegetarianism is already a good way of enabling people to discover a different way of eating.



[...] It's up to us to show our customers the way. [...] We have a long way to go, but we must not give up. The stakes are far too high.

Edgard Bovier, Executive  
Chef Hôtel de Rougemont

"Ever since I was a child, I've always been close to nature, eating the produce from our garden. I've been lucky enough to live in this environment with all these values, and during my summer vacations I used to herd cows in the Swiss Alps.

For me, nature means being responsible for the future of our planet and our children. Ecology has always been a concern for me. I personally select my local producers and make sure that my suppliers have a social and natural ethic. Gastronomic excellence rhymes with a search for meaning, a cuisine that is tasty, creative, authentic, healthy, sustainable and seasonal.

That's why I naturally joined the Less Saves The Planet movement! Eating 130g of meat or fish per meal is enough for everyone's well-being, and it has a considerable impact on the planet. We all need to make an effort, and we'll soon see the results - I'm counting on you.

Alexandre Willaume, Executive Chef,  
Grand Hôtel Thalasso & Spa de Saint Jean de Luz

"A few years ago, when I discovered the staggering figures for the consumption of animal products - the 3 million animals we put through slaughterhouses every day in France, and 70 billion a year worldwide - after being shocked and saddened, I decided to stop participating in this genocide, and became a vegetarian. Not to mention the products from our seas and oceans, which we are irrevocably draining of their resources, since we kill 1,000 billion marine animals every year.

The intensive industrialization of livestock farming is an ecological disaster on a global scale. Livestock farming occupies 70% of the world's agricultural land (grazing and production of cereals for animal feed), requiring 70% of the world's fresh water. Much of this food is intensively produced on the other side of the world, in countries where malnutrition is rife!

Despite this, I don't work in a vegetarian restaurant, but it was important for me not to stand by and do nothing, and to change everything I could at my own level, in the restaurant I work for, and to spread this information and awareness around me. So it was only natural to work with Fadi, since his values (preservation of the environment, healthy and tasty nutrition and animal welfare) matched my own. It was even a sign of encouragement for me to persevere in what has become my quest, for better treatment of animals, preservation of our resources, our planet, our future and that of our children. I'm proud to be part of the Less Saves The Planet movement!

Vincenzo De Rosa, Chef goutatoo  
Restaurant Café de La Place

"In my opinion, the "Less Saves The Planet" movement should be a new way of thinking about and consuming food in our world of cooks. As far as possible, always give preference to local products, know the origins, the producers, their stories and their passions."

Jean-Marie Pelletier, Chef goutatoo  
Chef Exécutif Hôtel Cailler

"The message is simple but so powerful for our planet. Let's follow the Less Saves The Planet movement for good taste and to save the planet."

Jean-Marc Bessire, Michelin-starred chef, President of the  
Association des Chefs goutatoo  
Restaurant Le Cigalon

"We don't see ourselves as saviors of the planet, but rather as actors. Because in our world of hotels and gastronomy, we have the power to get a message across, a powerful message. By doing less, we can do much more for the planet.

Less means reducing the meat portions of our menus, while preserving the nutritional value of vegetables and side dishes - in other words, eco-responsible menus. Less plastic with our daily arrivals, less straw in our cocktails. We need you, hotel and restaurant owners, to get this message across. Let's work together to make Less Saves The Planet a reality.

Philippe Bourrel, Chef goutatoo  
Chef Exécutif Prime & Co SA

"From a very early age, nature and the environment have always played an important role in my life. My training and experience with Michelin-starred chefs have taught me to work with local producers who are respectful of the environment and, above all, passionate about good produce. So it's only natural that my cooking follows the rhythm of the seasons. My menus are part of an approach that respects the environment, ensuring that the carbon footprint is as small as possible, and takes biodiversity into consideration. For me, gastronomy today is synonymous with respect for the environment.

Cecilia Zapata, Chef goutatoo  
Restaurant Pachacamac

"I believe that preserving the planet and its resources, as well as animal welfare, are not only a necessity but a duty for everyone, especially for those of us who practice this beautiful profession of cooking. Every product must be treated with respect and love, that's the basis of everything!"

Fabrizio Domilici, Chef goutatoo  
Chef Exécutif Geneva Marriott Hotel

"It's simply my way of cooking in the spirit of healthy environmentalism and sustainability."

Franck Meyer, Chef goutatoo  
Executive Chef Hôtel Président Wilson geneva

"Through the Less Saves The Planet movement I am proud to

to see gastronomy and chefs' know-how linked for the preservation of our environment. Let's eat intelligently and sensibly for the planet and future generations.

Serge Labrosse, Michelin-starred chef, Chef  
goutatoo Chef Exécutif La Chaumière  
Restaurant Boléro

"Adopting sustainable, local food is making the choice to eat good for the planet."

Julien Schillaci, Chef goutatoo  
Executive Chef Hôtel Métropole genève

"For me, Less Saves The Planet is a consumption model that makes sense and has a future. We are all concerned and all responsible. The image of the luxury hotel and catering industry is very attractive to people all over the world. It's up to us chefs to keep this consumer model alive, while maintaining our creativity and our pleasure in sharing our passion.

Thierry Minguez, Chef goutatoo  
Restaurant Café du Marché

"Was I too late to see that we were going backwards? The arrival of a little fellow in our lives opened my eyes and made me aware of the gustatory and environmental disaster of a world always in too much of a hurry. And it's up to us, the artisans of taste, to preach for proximity, reasoned and moderate carbon footprint, respect for good producers and respect for animals.

When selecting our products, we have to take into account

We should have listened to the pioneers, analyzed and understood.  
Thank you to all the die-hard fighters for the Good and the Healthy. Thank you Joseph and thank you Fadi.

## THE AUTHORS

- *Fadi Joseph Abou, owner of renowned restaurants for three generations and distributor of organic products, has been active from an early age in promoting healthy, delicious nutrition, a well-preserved environment and a planet on which people and animals can live happily.*

*Printed February 2022*  
*by Colorset Printing (Geneva), [www.colorset.ch](http://www.colorset.ch) French*  
*edition ©2018 Fadi Abou Chalbak, all rights reserved,*  
*legal deposit 4<sup>th</sup> quarter 2018*












This book was produced thanks to the partnership of :

**Magazine Less Saves The Planet Novel Earth**

**"learn to eat better to save the planet**

[less-saves-the-planet.com](http://less-saves-the-planet.com)

 less-saves-the-planet.com info@less-saves-the-planet.com   
Less-Saves-The-Planet  less.saves.the.planet  
 @LessSaves



Fadi Joseph Abou



Increasing greenhouse gas emissions, global warming, collapsing biodiversity - can we still oppose the inevitable?

Yes, and even on an individual level, if we commit to changing our consumption patterns and behavior.

Hoteliers and restaurateurs, too, have a crucial role to play in this approach, by setting an example and training and informing their customers and suppliers around a common goal that is easily applicable and whose impact on the planet will be obvious.

Is it still possible?

Yes, three times yes. The solution is within our grasp.



Less Saves The Planet

Free



9 782954 012834

ISBN : 978-2-9540128-3-4