Table 1:

	Appearance and texture	Input and advice
Beef	- Bright red flesh - Luminous flesh with flesh-coloured fat - Provides a firm, supple texture	- Fat more or less present depending on the nature of the pieces - Fat gives a specific flavour to meat
Veal	- Soft, tender flesh, more pink than white - Firm, white fat	Prefer free-range veal, raised under its mother's care
Pork	- Pearly pink flesh, white fat and supple rind - Firm texture	- Meat should be fine-grained and free of moisture - A finely marbled piece of fat will hold the box better
Poultry	- Beige to pink flesh, even yellow for corn-fed poultry - Flesh darker or lighter depending on of the breed	-Tight fibers and strong bones show that the animal had enough space to move around
Lamb	- Shiny, pink flesh (rather bright) - Flesh color variation: from pale to dark pink - Fine-grained flesh with white fat slightly pink	-The intensity of the pink color not to judge the quality of the meat

Table sources: Carrefour, Les Compagnons du Goût and Le Goût du Bœuf websites.

Table 2:

Table of game animals		
Species	**Geographical distribution**	**Special information**
Regulated game that can be eaten		
Sika deer / red deer Doe	Eurasia	Less fatty than beef, European venison is a healthy meat, low in cholesterol and rich in iron and protein. The venison leg is used to prepare a civet. The meat must marinate for at least one night before cooking. The deer's back is a very tender piece. Boneless, it can be roasted or cooked as steaks or steaks. Hinds are less fatty than beef, red in color and particularly tender. Fine and tasty, it is rich in potassium, iron and phosphorus.
Chamois	Eurasia	The chamois of the Alps and the isard of the Pyrenees are game species authorized for hunting (ministerial decree of June 26, 1987, modified by that of February 15, 1995). The hunting plan for chamois and isard was made compulsory throughout France by the ministerial decree of July 31, 1989.
Deer	Game species subject to compulsory hunting plan Eurasia	One of the least fatty game meats (three times less calories and twenty-five times less fat than lamb), with tasty flesh rich in iron, phosphorus and protein, and low in lipids and sodium. Young venison meat tastes best. Its tender, dark-red flesh does not 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.
Suede	Europe some parts of America (North and South) and Southern Oceania	Similar to venison, but less dry and strong than venison. It can be cooked in the same way as beef, as a fillet, roast, steak or stew.
Common thrush / mauvis / musician	Europe and Asia	It has a distinctive flavor and can be eaten roasted (stuffed or not).

Brown hare	Europe, Asia from West, Africa, Oceania and North and South America	Very low in calories and fat, but rich in iron and easily absorbed. Never feasting, the hare's flesh is brown (unlike the rabbit's, which is white), fine and refined. It's tastier and less fatty than rabbit. It can be cooked differently depending on the age and weight of the hare. When the hare is older, weighing between 3 and 5 kg, its meat is ideal f o r civets, pâtés and terrines. When it's younger, we recommend roasting or sautéing it, as well as the legs and fillets.
Wood pigeon / turtle-dove	Europe, Middle East, North Africa	Lean meat with fine flesh that is too little recognized for its taste qualities → rich in iron, protein, potassium, phosphorus and vitamins.
Water hen	Everywhere in the world except deserts and poles	
Wild boar	Europe	Game meat richest in lipids, but low in fat and high in phosphorus and potassium. Nutritionally close to chicken. 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.
Teal	Northern and West, Asia	The most difficult duck to hunt. Its coveted flesh is characterized by its brown color and bitterness. It can be fricasseed, roasted or stewed.
Protected game, eat sparingly		
Skylark	Present throughout the Northern Hemisphere and 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 inadvisable (hunting with glue, nets, etc.).
Red godwit	Present in northern Europe, northern Asia and on the coasts of Africa, Asia and Australia during the migratory period.	

Woodcock	Eurasia	One of the most popular birds among hunters and their families. Its tender, fatty flesh can be pared for 4 to 6 days to be prepared as a stew or terrine, or simply roasted. Hunted in all E U countries and neighboring regions (Balkans, former USSR) by both resident and foreign hunters, except in the Netherlands, Belgium (Flanders), Slovenia and German-speaking Swiss cantons. Its sale is prohibited in France.
Wheat quail	Eurasia and Africa	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. Fine and tasty, it can be sautéed, grilled or stuffed.
Mallard / Pintail / chipeau / whistler / northern shoveler	Oceania's Northern and Southern Hemispheres	Its meat is less fatty than that of farmed duck and rich in iron, vitamin D and phosphorus. 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 should be roasted, basted with port or Madeira, for example; the meat of an older duck should be fricasseed.
Barking Redhorse / Harlequin Redhorse / Fighter Redhorse / Gambrel Redhorse	Appraised and regulated / protected Eurasia, sub-Saharan Africa, Asia and part of Oceania.	The barking redhorse is not subject to any specific regulatory measures. The species is huntable in France. The harlequin, warbler and gambard, on the other hand, are protected species.

Pheasant	Evaluated and regulated → classified as "endangered protected fauna" but "which can be hunted" under the Bern Convention (CITES) Asia, Europe, North America, Australia	Firm, flavorful flesh, high in protein and low in fat. 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 perfect for terrines and pâtés. The carcass can be used for preparation of a fumet. The flesh of the pheasant hen is finer, and less tender. dry than pheasant.
Partridge (grey / red)	Classified as "minor concern" at the European level Europe, Asia, Africa and 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 partridge is perfect for braising in a casserole or preparing pâté, estouffade (slow, covered cooking) or salmis (stew).

Endangered game, not to be eaten			
Snipe des marais / sourde	Europe	Blackbird	Europe, Asia, North Africa, Australia, New Zealand
Black-tailed godwit	Anywhere in the world except Central/South America	Greylag goose	On the IUCN red list Eurasia and Southern Oceania
Wild rabbit	Found in the wild on all continents excluding Asia and Antarctica	Crested Lapwing	Eurasia, North Africa

Sources:

http://www.oncfs.gouv.fr/Connaitre-les-especes-ru73/ ;

http://www.gibier-de-chasse.com/connaitre/gout-gibier-de-chasse.html

Table 3:

MAIN HUNTING TECHNIQUES	
Stalking / approaching	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.
Driven hunting	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 role: 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.
Hunting / Venery	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.
Hunting without a gun	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).
Glue hunting	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 consists of spreading adhesive tape on a tree, placing bait on it, and then retrieving the trapped birds by the hunter.
Net / pante hunting	Very popular in the South-West, this method consists of trapping larks using nets laid on the ground, which close on the bird once it has landed.
Tendelle hunting	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.

Snaring	Outlawed in France, this technique is still used by poachers in countries where animal rights are less important. The snare is a brass wire pulled across the animal's path with a noose that strangles it once it's caught.
Matole hunting	Seeds are placed in an open cage to act as bait; once the bird has entered, the little rod holding the door open falls out and the bird i s trapped inside.

Table 4:

	Label Bio	*Eligibility criteria*
European	Eurofeuille 	➔ 100% of ingredients are organically produced. ➔ 95% minimum of organic agricultural products in the case of processed products, if the remainder is not available organically and is expressly authorized. ➔ The label bears the name of the producer, processor or distributor and the approval number of the certification body. ➔ The product complies with the rules of the official control and certification system.
France (principaux labels)	Agriculture Biologique (AB) 	➔ 95% minimum of ingredients from organic farming. ➔ Guaranteed GMO-free production with a tolerance of less than 0.9% in the event of adventitious contamination. ➔ Agronomic practices that respect natural balances, soils and soil cycles. environment and animal welfare. Compliance with current ➔ French regulations.
	Ecocert 	➔ At least 95% of ingredients are of natural origin. ➔ At least 10% of the total ingredients are organically grown, with 70 % fair-trade fibers. ➔ 5% maximum from a very restricted list of synthetic molecules used in particular as preservatives. These molecules must be mentioned on the packaging. ➔ All Ecocert products must bear the European organic label and guarantee a decent minimum wage for workers and producers. ➔ Synthetic fragrances and colorants, silicones, parabens, glycols, etc. are prohibited. ➔ Raw materials of animal origin are not authorized, with the exception of the following products and animal by-products that do not directly endanger the life of the animals, and whose harvesting has no harmful effect on ecological balances (wax propolis, honey, milk, etc.). ➔ Product testing on animals is prohibited.
France (principaux labels)	Bio Cohérence 	➔ Products available only in organic stores, or by direct sale. ➔ The label guarantees humanist well-being and requires that all organic farming structures are French and receive a fair income. ➔ No mixing of organic and non-organic production. Farm activities must be organic or in conversion to organic. ➔ The minimum GMO contamination threshold is limited to 0.1%. ➔ At least 50% of animal feed must be produced on the farm, and 80% for herbivores. ➔ Preservation of the principle of the link to the soil, which disappeared with the European label.

		➔ Authorized veterinary treatments are more restricted than with the European label.
Bio France (principaux labels)	Bio Partner	➔ Compliance with European organic regulations. ➔ Guarantee of ecological production methods. ➔ Certified organic and fair trade products. ➔ Supports local French production with also a proper remuneration for producers. ➔ tructures committed to the label must draw up contracts guaranteeing producers prices and quantities purchased over a minimum 3-year period. ➔ The label is only available in specialized organic stores in France.
Label Rouge	Label Rouge	➔ Created in the 1960s, Label Rouge certifies that a foodstuff or a product has been unprocessed, non-food agricultural product has a high quality level than that of a similar current product (this also applies to products from or non-food agricultural products such as Christmas trees). ➔ This superior quality is regularly assessed and monitored through sensory tests carried out on products eligible for certification. ➔ Label Rouge is open to products whatever their geographical origin, including outside the European Union.
Canada	Organic Canada	➔ Products must contain no less than 95% certified organic ingredients to the requirements of the Bio-Canada system (the organic certification system described Part 13 of the Canada Food Safety Regulations, which governs the certification of organic products according to applicable regulatory requirements, standards and guidelines).
Switzerland	Biosuisse (and its Bud brand)	➔ ll agricultural production and processing of organic products. ➔ Level A (which concerns 97% of certified products): provides guarantees on the protection of the environment (soil, air, water) and the production model (pesticides...), fertilizers, veterinary drugs, additives). ➔ A level: almost identical to an organic farming label.
Japan	Japan Agriculture System Bio	➔ less stringent label than that of the EU, but certifying a more rigorous production method. local and healthier (with as few pesticides as possible) than for the rest of the world. of national production, i.e. certification for 12,000 farmers and 0.5 of the country's cultivated area.
China	Wugonghai	**Wugonghai ("Harmless agricultural products")** ➔ Limits the presence of chemical elements and residues in the final product.

	Lüsse shipin 	**Lüsse shipin ("Green products")** ➔ Level A (which concerns 97% of certified products): provides guarantees on the protection of the environment (soil, air, water) and production model (pesticides, fertilizers, veterinary drugs, additives). ➔ A level: almost identical to an organic farming label. **All Chinese organic products must bear the "Organic" label.**

Table 5:

	Food consumed	**Restrictions and special features**	**Special features of the diet**	**Nutritional benefits of foods consumed**
Omnivore	Meat / fish Fruits / vegetables Cereals Milk / eggs	No food is forbidden	No deficiencies or increased cancer/cardiovascular risk if well balanced	**Meat:** iron, vitamin B, protein **Fish:** minerals, proteins, vitamin D, omega 3 **Fruits and vegetables**: vitamins, minerals, antioxidants **Cereals:** fibre, vitamins B and E, minerals, essential fatty acids, vegetable proteins **Eggs:** protein, vitamins, trace elements, antioxidants, good for the eyes **Milk**: calcium, vitamin D, minerals

Vegetarian n	Fruits / vegetables Cereals Milk / eggs	Everything except meat and fish can be eaten	High-fibre diet if practised properly Effectively reduces the risk of diabetes, colon cancer and transit disorders	**Fruits and vegetables:** vitamins, minerals, antioxidants **Cereals:** fibre, vitamins B and E, minerals, essential fatty acids, vegetable proteins **Eggs:** protein, vitamins, trace elements, good fats, antioxidants good for the eyes **Milk:** calcium, vitamin D, minerals
Vegan	Fruits / vegetables Cereals	No animal products consumed	The risk of cancer is even lower than for vegetarians, and weight loss is favoured.	**Fruits and vegetables:** vitamins, minerals, antioxidants **Cereals:** fibre, vitamins B and E, minerals, essential fatty acids, vegetable proteins

Table 6:

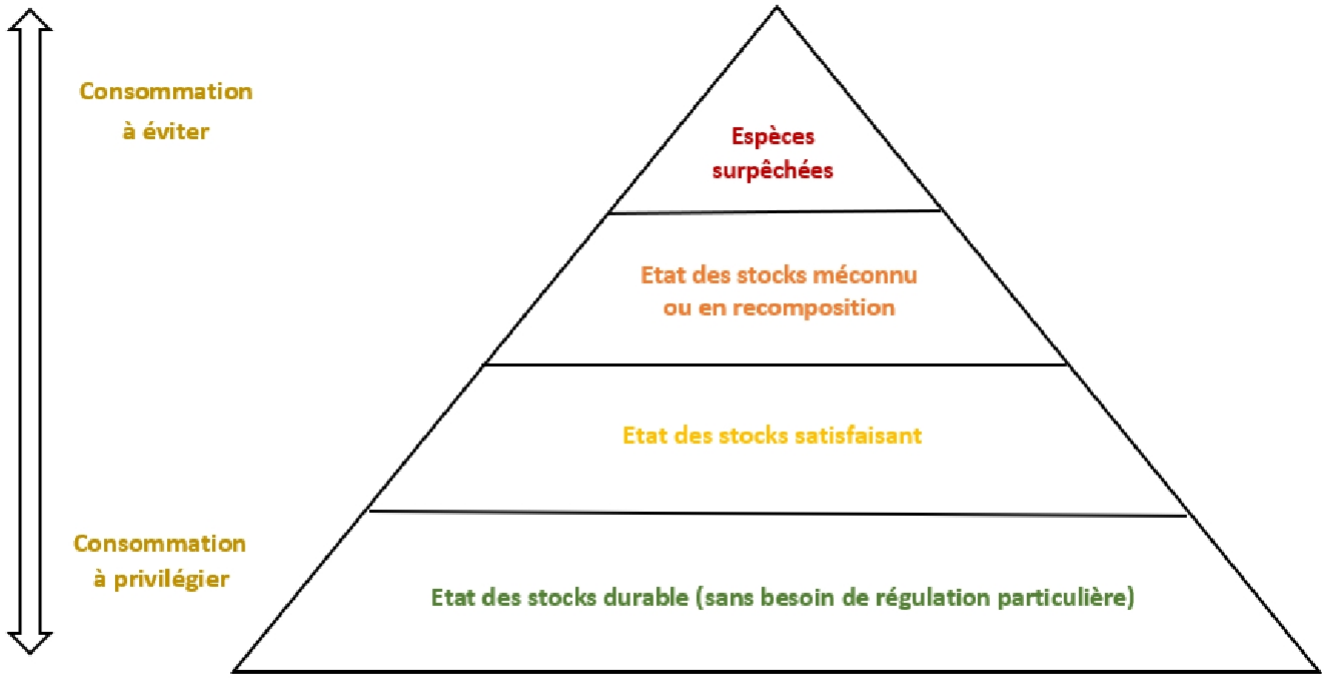


Table 7:

TABLE OF FISH, SHELLFISH AND OTHER SEAFOOD THAT CAN BE EATEN WITHOUT PROBLEMS			
Fish name / shellfish	***Origin(s) -*** ***Inventory status - Existing eco-responsible sourcing*** ***Country legislation***	***Minimum size to consume and preserve the species -*** ***Seasonality -*** ***Recommended and inadvisable fishing techniques -*** ***Organic labels and certifications***	***Observed pollution levels -*** ***Nutritional intake -*** ***Potential alternative to which species?***
Green / brown / red algae	*Strong development potential for the macroalgae industry:* *Exports mainly to Europe and imports of around 130,000 tonnes from Chile, the Philippines and Tanzania.* *24 species authorized for consumption in France*	*Supply of AB eco-certified seaweed, guaranteeing sustainable practices and good water quality*	*Spirulina: proteins and iron* *Sea lettuce: iron, calcium and vitamin C* *Chlorella: eliminates heavy metals* *Klamath: anti-inflammatory and antioxidant* *Sea beans: minerals and antioxidants* *Kombu (royal / Breton): minerals, fights cholesterol / harvested in spring and summer* *Wakame: vitamins A, B and C, and proteins / harvested in spring and summer* *Dulse: vitamin C / harvested in spring and autumn* *in autumn*

			Nori: protein and calcium / harvested at spring and autumn
Sea almonds	*Species not subject to regulations (sustainable stock)*	***6 cm***	*Firm flesh, delicately iodized, rich in proteins, vitamins and minerals*
Barbue	*Little-known stock sustainable: Channel and North Sea (biomass up since 2005)*	*No minimum marketing size, so prefer those >* ***35 cm***	*Very low in fat, low in calories, rich in protein and amino acids*
Bonito / skipjack tuna	*Satisfactory stock levels* *Avoid eating skipjack tuna caught under FADs*	*Fishable and consumable all year round* ***35 cm - 1 m***	*Lean fish* *Sometimes a victim of marine toxins*
Bulot *(Busycotypus canaliculatus species)*	*Durable stocks in Normandy (whelk) de Granville)* *Heavily overfished stock: West Atlantic coast in the Gulf of Maine, USA*	***40-45 mm*** *Granville whelk has been awarded the Granville Bay" and the "Granville Bay" eco-label.* *MSC sustainable fishing*	*Low-calorie and nutritionally interesting* *Quality whelk: odorless and smooth to the touch*
Squid	*Satisfactory stocks: South-West Atlantic, South-East Pacific*	***11 cm*** *Favour jig fishing and avoid pelagic or bottom trawling.*	*Source of nutrients (vitamin B12, Omega-3) but cholesterol* *Quality squid: thickest, translucent, firm flesh with slightly pearly tentacles*
Common hull	*Species not subject to regulations (sustainable stock)*	***2.7 cm***	*Firm, fleshy flesh with a rich, iodized taste in vitamins*
King crab	*Major illegal fishing in Russia (main operating country with Norway)* *Imported into Europe mainly in the form of unshelled claws*	***130 mm*** *Barents Sea fishery, MSC-certified, stocks available, no overfishing*	*Up to 10 kg and 1.5 m long*
Caramote shrimp		***12 cm*** *Avoid buying from June to October (egg-bearing period)*	*Firm, low-calorie, high-protein flesh; easy to shell*
Northern shrimp	*Satisfactory stock : Skagerral / Kattegat, Northeast Arctic, Norwegian Sea and Canadian Northeast Pacific*	***16 cm***	*Contains coenzyme Q10, a good quantity of omega-3, rich in vitamin B12, vitamin B3, phosphorus and niacin.*

	Discharge banned in Iceland and Western Arctic *Overfished stock: Northeast Atlantic (Iceland, North Sea and Greenland)*		
Tropical shrimp / Gambas	*Rapid reproduction but global overexploitation* *Only compliance with safe biological limits: Australia* *Intensive aquaculture in South-East Asia and Latin America: focus on organic and zero input farms* *(no chemicals, fertilizers or medicines; less polluting)* *Madagascar shrimp certified "Organic Agriculture" 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 Guyana, 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 *Sea bream* *Pink sea bream Red 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*
Etrille	*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	*Sustainable stock: the North-East Atlantic (over 2 million tonnes of catches / year)* *Overfishing in the 1970s; resources rebuilt in some areas*	***16-17 cm*** *16 MSC eco-labelled herring fisheries (in the UK, Canada, the Faroe Islands, Ireland, Denmark, Norway, Sweden, the Netherlands and France - FROM Nord)*	*Rich in phosphorus, selenium, potassium, vitamins B6, B12, D; omega-3* *White, fatty, very tasty flesh; does not tolerate overcooking or poaching*

	Satisfactory stock levels: North Sea Baltic, Gulf of Bothnia and Riga *Overfished stocks: Iceland, West Baltic and Northeast Atlantic*		
European and North American lobster	*North lobster production 20 times greater than that of European lobster* *Durable inventories:* *Europe Satisfactory US* *inventories : focus on lobster from Canada, Gulf of Maine and Saint-Georges-Bank*	*North European lobster :* ***80 mm*** *Canadian lobster:* ***82 mm*** *European lobster:* ***95 mm*** *7 MSC-certified fisheries worldwide (6 American lobster and 1 co-managed by Normandy and Jersey)*	*Avoid seeded lobsters: females bearing eggs*
Hollow oyster	*Focus on the most local AB-certified production possible: Japan, Korea, Siberia, Australia, United States, Canada and Europe.*	*Prefer hand-picking, a highly selective fishing method* *MSC-certified wild oyster fisheries* *(2 in the Netherlands, 1 in Japan and 1 in the United States)*	*Negligible by-catch and discard rates; minimal impact on benthic habitats*
Langoustine	*Durable stock* *Mainly west coast of Scotland* *Overfished stock: Southern Bay of Biscay* *(many accessory plugs)*	*Female sexual maturity:* ***7.5 cm*** *Male sexual maturity :* ***8.5 cm*** *Prefer* ***10 to 20 cm*** *Consume in moderation, except for creel fishing* *1 Danish-Swedish MSC-certified fishery*	*Although it is lean, its flesh contains essential omega-3s EPA and DHA*
Saithe / Hake / Haddock / Pollock	*Satisfactory stock but species highly sensitive to overfishing* *Rebuilding stock: Iceland (biomass increasing) and Western Scotland* *Overfished stock: Feringian*	***35 cm** in European waters* ***60 cm** or over 2.3 kg for gutted fish* *Year-round consumption* *15 MSC eco-labeled saithe fisheries in the Northeast Atlantic, including 3 in France: Euronor, la Compagnie*	*Eco-responsible alternative to cod* *Neutral taste and few bones* *May contain traces of toxic substances such as mercury*

Dab - common sole	*Sustainable stock: North Sea and English Channel (biomass stable 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*
Mackerel	*Not very vulnerable to fishing pressure (satisfactory stock), but no information on management frameworks for ecosystem conservation in the areas observed.*	***30 cm** (minimum breeding size)* *Moderate by-catch and discard rates: negligible impact on the seabed*	*Semi-fat pelagic fish rich in* *omega-3s*
Mould	*Improved breeding conditions in Europe* *Worldwide, management measures must be taken to limit dredging and promote the sustainable exploitation of spat.*	***6 cm*** *Prefer rearing on wooden poles or ropes: avoids mixing invasive species and spreading harmful parasites.* *Avoid dredging, which damages the seabed* *In favor of farmed mussels AB / CSA certified*	*No feed supply required: mussels filter their food from the water*
Mullets / muges	*Species not subject to regulation (sustainable stock)*	*Golden mullet: **21 cm*** *Hog mullet: **30 cm*** *Striped mullet: **35 cm***	*Eco-friendly alternative to the bar*
Clam	*Species not subject to regulation* *Durable stock*	***Between 3.5 and 4 cm*** *Hand-fished in the Northeast Atlantic and farmed in Europe and North Africa*	*They can be eaten raw or cooked.*
Panga(sius)	*Pangasius produced in Vietnam and certified GLOBAL G.A.P.*	*Breeding conditions rarely viable* *Buy ASC-certified or organic*	*Alternative to overexploited species*
Nile Perch	*Reconstituted stock: Lake Victoria*	***60 cm to 2 m***	*Fillets with firm, white flesh; important source of protein*
Saint-Pierre	*Satisfactory inventories, but* *Caution: increasing catches for several years and lack of fishing management measures*	***37 cm (600 g)**: minimum breeding size*	*Numerous appellations :* *"Soleil" in Dunkirk, "Jean-Doré" in Boulogne-sur-Mer, "iar vôr" in Brittany, "in Concarneau,* *"rose" in Arcachon, "gaill" in Roussillon and "San Pedro" in Nice*

			Noble" species: rarity, high price and great finesse
Rabbitfish	*Satisfactory inventories :* *Prized neither in restaurants nor in local cuisine, only fishermen and local residents eat it.*	***12-14 cm***	*Eco-responsible alternative to grouper*
Tacaud	*Stock status: undocumented, not subject to catch quotas or minimum market sizes* *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-responsible alternative to white fish*
Tassergal	*Species not subject to regulation* *(durable 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 albacore tuna fisheries (10 in the Pacific and 1 in the Spanish Northeast Atlantic)*	*Eco-friendly alternative to other tuna species*
Skipjack / skipjack tuna	*Most-fished variety of tuna: present in many areas and reproducing fairly 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 activities or protective measures against overfishing*
Tilapia	*Introduced on the European market since* *The 2000s*	*AB supply of tilapia developed* *41 ASC-certified farms worldwide (25 in Asia-Pacific and 16 in Latin America)*	

Tourteau	*Unrecognized and unsafe stock zones* *Satisfactory stock : France* *Overfished stocks: United Kingdom, Scotland, Norway and eastern waters* *Management of this fishery is rather weak in almost all areas, except in Ireland where it is quite effective.*	*Female sexual maturity :* ***14 cm** (3-4 years)*	*Norway and Eastern UK fight for better fishing conditions and better rejection, mainly of undersized crabs*
Trout	*In the wild, satisfactory stock* *Farmed for over a century and intensively produced in several European countries (mainly rainbow and fario trout).* *In Northern Europe and Turkey, stringent requirements for breeding, thus limited environmental impact* *In Southern Europe: management varies from country to country and is not always strictly applied*	*Marketing **200 to 300 g*** ***350 g** : 1 year* *Mainly targeted by recreational fishing* *Supply of organically farmed trout, of which France is the world's 1er "AB" certified producer.* *80 ASC-certified breeding farms (Norway, Germany, Chile, Denmark, Greece, Iceland, Italy, Peru, Turkey, Spain, Japan and France)* *Effective certifications, such as Global GAP,* *"Friend of the Sea" and "ASC", are currently in development.*	*Eco-responsible, local alternative to salmon and other farmed fish from distant origins*

Table 8:

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 all preserving the species - Seasonality - Recommended and inadvisable fishing techniques - Organic labels and certifications***	***Observed pollution levels - Nutritional intake - Potential alternative to which species?***
Anchovies	*Represents at least 15% of the annual global catch: total allowable catch volume* *(extremely fluctuating biomass due to the short lifespan of this species)* *Sustainable stock: Bay of Biscay and Western Portugal* *Insufficient stocks : Mediterranean and Atlantic*	*Mediterranean:* ***9 cm*** *Atlantic:* ***12 cm*** *Spring and summer consumption period*	*Power base for many carnivorous fish, such as tuna and shark, and certain birds.* *Very healthy and not very polluted / affected by mercury* *Oily fish: source of vitamins and omega-3* *Perishable fish, rarely fresh on the shelves, more likely to be processed.*
Spider crab	*Unrecognized stock* *Sustainable stock: Brittany, Channel and North Sea* *Additional measures to protect the species around the world*	***12 cm*** *Avoid capture with fixed nets* *(blocking sharks, rays, porpoises... in the wires)* *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 trapped there).*	*Fine, low-fat flesh with strong iodine flavour*
Sea bass / wolf	*Satisfactory stock : South (Gulf of Gascogne)* *Overfished stock: Northwest Atlantic,* *(Celtic Sea, Channel, Irish Sea and du Nord)* *Little-known stock: West of Scotland and Iberian coasts* *Unregulated fishing: Eastern Central Atlantic and Mediterranean*	*North Sea, Celtic Sea, English Channel and Irish Sea:* ***42 cm*** *Bay of Biscay and Iberian waters:* ***38 cm*** *Mediterranean Sea:* ***25 cm*** *Fishable and consumable all year round* *Avoid trawling*	*Lean fish: fatty acids, proteins, minerals and trace elements* *No specific pollution reported* *Eco-responsible alternative to wolffish* *Buy fresh but not emptied*

	But trawling is banned in EU during the breeding season on spawning grounds	*France: recreational fishing limited to 2 bars per person per day in 2020* *Focus on organic farmed bass*	
Cod	*World's most eaten fish species: victim of overfishing* *Sustainable stock: Iceland, Northeast Arctic seas* *Overfished stock: Pacific, Atlantic, Irish Sea, Western Scotland, Western Baltic Sea, Northeast Arctic, Northeast Antarctic, Norway, Eastern Channel, Faroe Islands, Western Celtic Sea*	*Professional anglers:* ***35 cm*** *Recreational anglers:* ***42 cm*** *Prefer* ***42 cm*** *Avoid bottom trawling Prefer pelagic trawling* *16 MSC-certified fisheries (Iceland, Faroe Islands, Norway, Denmark, United Kingdom, Spain, France, Russia and Canada)*	*Prefer cod backs as they are cut from fish weighing more than 2 kg.* *Avoid 100-200g fillets cut from cod called "Codfish" that did not reproduce* *Lean fish rich in complete protein, including all 9 essential amino acids* *No pollution reported, although may contain traces of mercury*
Carrelet / plaice	*Sustainable stocks: European waters, especially in the North Seas (East + West Channel, North Sea, Celtic Sea and of Ireland)* *Overall overfished stock*	*Baltic Sea:* ***25 cm*** *Everywhere else:* ***27 cm*** *Avoid consumption during the breeding season: flesh is less firm and less edible.* *8 MSC-certified fisheries (Denmark, Scotland, Iceland and the UK)*	*Source of protein, vitamin B6 and omega-3 with low fat content* *Carrelet / quality pile: shiny, firm and elastic, glossy and slimy appearance, red dots on fins as visible as those on back* *Tendency to store pollutants, especially heavy metals*
Farmed caviar (Sturgeon)	*Caviar sold in the EU marked by a label with a code for species, country of origin/packaging, batch, etc. + a letter ("W" for "Wild" and "C" for "Captive")*	*Prefer farmed caviar ethics*	*Rich in omega-3 and vitamin D*
Alaskan bobwhite	*Overfished stock: Russia from the sea Okhotsk and Western Bering Sea*	*3 MSC-labelled hake fisheries: the Bering Sea/Aleutian Islands fishery, Gulf of Alaska fishery and Russian Sea of Okhotsk fishery (Western Pacific)*	*Flaky flesh rich in omega-3s*
Congre	*Unrecognized stock*	***85-95 cm***	*Firm flesh*

		Prefer net or line fishing	
Scallops	*Satisfactory stock : Channel and small deposits on the Atlantic coast under close surveillance*	*Most fishing by dredge on the seabed: consume with moderation* *Prefer hand-farming or hand-fishing* *7 MSC-certified fisheries (Japan, China, Argentina, United States, Shetland Islands and* *2 in Canada)*	*Please note: all pectinids can be claim the appellation* *"For scallops that are processed or frozen, check the nature of the product purchased.*
Grey shrimp and bouquet	*Pandalus borealis sustainable stock: North Atlantic* *Overfished stock: Skagerrak, Kattegat* *and Northern North Sea* *Overfished crangon shrimp*	***5.4 cm** (whole)* *Prefer fishing with traps* *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).*	*Crunchy, iodized flesh, essential fatty acids, omega-3, astaxanthin and coenzyme Q10*
Haddock	*Sustainable stock throughout the Atlantic North* *Satisfactory stock: Irish Sea and Rockall* *Overfished stocks: North Sea, Iceland, Northeast Arctic, Celtic Sea, English Channel, and especially in Scotland and the Faroe Islands.*	***30 cm*** *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)*	*Lean fish source of vitamin B1* *Quality haddock: pinkish-white flesh*
Swordfish	*Satisfactory stock: Indian Ocean, North Atlantic, Southeast and* *Northeast Pacific* *Overfished stocks: Mediterranean and South Atlantic, Sierra Leone, Belize, Honduras and Seychelles*	*14 MSC-certified swordfish fisheries in the Atlantic and Pacific*	*Heavy metal concentrations above European standards in overfished areas*
Halibut	*Vulnerable to overexploitation :* *slow growth and late sexual maturity* *Satisfactory stock : Northeast Pacific*	***65-80 cm*** *Favoring stocks fished with bottom longlines*	*Lipid-rich Greenland halibut*

	Endangered stock: white halibut *(except if it comes from the Canadian MSC-certified)*	*5 MSC-certified Atlantic fisheries North*	
Hoki	*Durable stock: New Zealand and Australia* *Overfished stock: Argentina* *Endangered stock: Chile*	***> 60 cm*** *3 MSC-certified fisheries* *(New Zealand, Australia and Argentina)*	*Eco-responsible alternative to cash traditional North-East Atlantic*
Lobster	*Threatened red and pink lobster stocks: Atlantic coasts* *Restocking: Mediterranean, Australia and South Africa*	***11 cm** (general regulation but may vary according to variety and geographical area)* *Prefer trap fishing* *Avoid trammel net and gill net fishing* *4 MSC-certified fisheries (1 in Mexico, 1 in Australia, 1 in the Bahamas and 1 on Tristan da Cunha Island)*	*Mercury build-up over time*
Yellow pollack	*Sustainable stock: Northeast Arctic and Norwegian Sea* *Satisfactory stock: North Sea, Iceland* *Warning: In Iceland, it is forbidden to throw fish back into the sea, but the quantity of young fish still unable to reproduce can reach a quarter of the fish caught.*	***40 to 50 cm*** *Avoid slipping, purse seining and bottom trawling* *Prefer fishing with nets and gillnets*	*Pink, pearly flesh that separates into petals, rich in protein, polyunsaturated fatty acids and omega-3s*
Monkfish	*Satisfactory stock: Celtic Sea, Gulf Biscay, Spain and Portugal (Northeast Atlantic)* *Overfished stock: Scotland and North Sea* *Heavily overfished stocks: China and Mediterranean*	*Males: **50 to 70 cm*** *Females: **65 cm*** *Prefer gillnetting: better stock management*	*Flesh and texture similar to veal*
Slim	*Unknown stock:* *Drink in moderation*	***30 cm** officially* *However, sexual maturity pruning is preferable:* *for males: **53 cm*** *for females: **82 cm***	

		Refuse fish offered by non-professional fishermen and check production conditions for farmed meagre.	
Whiting	*Satisfactory stock levels: Bay of Biscay and Iberian coasts*	*Avoid bottom trawling*	*Fish of 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, Southwest 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 and vitamin D, phosphorus and omega-3*
Sea urchin	*Satisfactory stock :* *France Regulated and prohibited fishing in breeding period* *Overall overfished stock*	*Atlantic: **4 cm*** *Brittany: **4.5 cm*** *Mediterranean: **5 cm*** *Avoid the breeding season from April 15 to November 1 er*	*Highly iodized flesh, rich in protein*
Plaice	*Species vulnerable to overfishing: slow growth and maximum life expectancy* *Replenishing stocks: Celtic Sea*	*Avoid fishing with beam trawls* *Favoring denoise seine fishing*	*Consume in moderation due to large catches of undersized plaice.*
Octopus	*Sustainable stock: Guinea-Bissau Satisfactory stock :* *Mauritania* *Overfished stock: Morocco, Senegal, Gambia*	*To buy: **750 g whole** and 450 g gutted* *Preferred mantle length: Male sexual maturity: **8 cm*** *Female sexual maturity: **12 to 13 cm*** *1 MSC-certified fishery in Asturias (Spain)*	*Tough flesh, must be cooked a long time to soften*
Rascasse	*Unrecognized stock*	***12 cm***	*Fine, tasty, firm flesh*

Red mullet (rouget, rouget de roche, rouget de vase, rouget du Sénégal)	*Sustainable stock: Indian Ocean and Senegal* *Satisfactory stock : Atlantic, North Sea, North-East Channel, Corsica, Sardinia, Balearic Islands* *Overfished stock: Mediterranean (wild and farmed), North Sea and Gulf of Lion*	*Minimum reproduction size:* ***17 cm*** *Fishable and consumable all year round*	*Noble fish: delicate flesh and tasty* *"Semi-fat with very fine bones* *May contain traces of pollution depending on its origin* *Quality red mullet: rigid, tight skin and dark pupil. Sold whole and gutted, without head, scales or viscera.*
Black sword	*High vulnerability to overfishing: slow growth* *According to Greenpeace, 80% of the the species has disappeared in 30 years* *Stock replenishment: Europe (regulations in place)*	***70 cm*** *Avoid bottom longline fishing* *Avoid the silver scabbardfish Lepidopus caudatus, a close relative of the black scabbardfish.*	*These fisheries are subject to TACs.*
Sardines	*Heavily overfished stock: European coast, Mediterranean* *(In the Mediterranean, 2e most-fished species of small pelagic fish)* *Overfished stocks: English Channel and Bay of Biscay* *Satisfactory stock : Atlantic* *Sustainable stock: Morocco*	*Atlantic (and throughout the EU):* ***11 cm*** *Mediterranean:* ***12 cm*** *Avoid spring in the Bay of Biscay and September to May in the Mediterranean (breeding season).* *4 MSC-certified fisheries* *(Great Britain, 2 in France and Mexico)*	*Very tasty fish, rich in unsaturated fatty acids* *Quality sardines: bright, rigid carmine-red, moist gills, bright eyes and no blood stains on the gills; do not buy headless.*
Salmon Atlantic	*Stocks down 75% in 20 years according to WWF* *Reproduction has disappeared from 15% of rivers: dependence on freshwater weakens the species*	*Prefer organic farming: raised in sea cages and fed exclusively on organic feed, without drugs or colorants.* *100 MSC-certified farms (Norway, Scotland, Poland, Faroe Islands, Ireland, Chile, Canada, Australia)*	*Ask your supplier about the aquaculturist's practices* *Choose certified salmon* *"Organic Agriculture*
Cuttlefish	*Overfished stock: Channel*	*Minimum reproduction size :* ***18 cm*** *Eat in moderation: the impact of fishing on the Sepion stock (immature cuttlefish)*	*Short life and high variability of abundance from one year to the next*

Sole	*Sustainable stock: Bay of Biscay, English Channel, North Sea and Skagerrak- Kattegat* *Rebuilding stock: Ireland Little-* *known stock: Europe* *Overfished stock: West Africa*	*Minimum reproduction size :* ***30 cm*** *3 MSC-certified fisheries (Denmark, Holland, French FROM Nord fishery)*	*Fish with delicate flesh, a distinctive but mild taste and a reputation for being boneless.*
Surimi	*Alaska Pollock stocks: satisfactory* *Hake stocks: threatened in the Gulf of Lion, Southwest 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 doesn't mention the composition or origin.*	*Very low yield in relation to the quantity of raw material used* *Elimination of all soluble proteins during the manufacturing process*
Yellowfin tuna	*Stock at risk: Indian Ocean* *Overfished stock: Eastern Pacific and Atlantic* *Lack of catch limits, insufficient monitoring and inadequate controls.* *Responsible organizations unable to 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*

Table 9:

TABLE OF FISH, SHELLFISH AND OTHER SEAFOOD TO AVOID EATING			
Fish name / shellfish	***Provenance(s) - Inventory - Country legislation - Existing eco-responsible sourcing***	***Minimum size to consume all preserving the species - Seasonality - Recommended and inadvisable fishing techniques - Organic labels and certifications***	***Observed pollution rate - Nutritional intake - Potential alternative to which species?***
Eel ("Unagi" / "Kabayi" / "Kabayi" on Japanese restaurant menus)	*Critically Endangered* *Silver eel fishing strictly prohibited, except for professionals in a few sectors* *Yellow eel fishing subject to restrictions restrictions (1re or 2e category rivers)*	*To plan a reintroduction would require :* *- ban elver fishing by boat* *- reintroduce fishing on foot* *- ban fishing for adult eels in autumn when they return to the Sargasso Sea to lay their eggs* *- limit fishing to 1 or 2 months per season instead of the current 5 months (November 15 to April 15)*	*Average mercury pollution rate*
Brosme / loquette / tusk / torsk / pousse-morue	*Threatened since 2003 with a stock being reconstituted* *Population has fallen by 90% in the Gulf of Maine and on the southeastern Scottish shelf (although the stock is constantly increasing, it remains very limited).*	***50 cm***	*White flesh, pronounced iodine taste*
Wild caviar	*On the endangered red list of IUCN* *Endangered wild caviar stocks:* *Russia and Iran (main producers of wild caviar)*	*Wild sturgeon :* ***1,5 m***	*Drink in moderation and only from livestock*
Cernier atlantic / grouper	*Highly threatened (accounts for 30% of catches) in the EU in 2008)*	*Mediterranean: **45 cm** officially / **90 cm** to guarantee reproduction*	*Flesh white, firm and fine.*

Horse mackerel	*Stock divided by 10 in 20 years* *Overfished stock: Northeast Atlantic*	*North Sea and Atlantic :* ***15 cm** minimum for breeding* *Mediterranean: **23 cm*** *Handle: **30 cm***	*Fine, translucent white flesh, firm and semi-fat; rich in omega-3s*

	Little-known stock: North Sea *Stock at risk: Mediterranean*	*Fishable year-round in the Atlantic Ocean; buy if fished by handline and in Northeast Atlantic stocks.* *Prefer catching with a purse seine*	*To buy fresh horse mackerel, pay attention to the liveliness, brilliance and clarity of the eye, as well as to the gills, which should be bright and of a uniform hue*
Pink shrimp	*Stock at risk (despite regulatory measures, stocks continue to decline)*	*Males:* ***14 cm*** *Females:* ***16 cm*** *Choose the variety of shrimp you prefer. purchase*	*Fisheries closed in several Mediterranean regions*
Freshwater / American / White-footed crayfish	*American crayfish stock: overfished* *Farmed crayfish: Turkey and Australia (Yabby)* *Endangered: Footed crayfish and freshwater crayfish*	*For livestock farming, ask the farmer about production conditions and give preference to extensive farming.*	*Species highly affected by water pollution*
Emperor	*Extinguishing hazard* *Stock at risk: Northeast Atlantic*	*No official minimum size* *Avoid all sources other than MSC-certified New Zealand fisheries*	*Very white, soft and fine flesh*
Grenadier	*Low productivity* *Restocking: Europe*	***50 cm***	*Fishing prohibited over 800 m*
Patagonian toothfish / Chilean sea bass	*One of the most common deep-water species threats*	*Males:* ***56 cm*** *Females:* ***85 cm*** *Only deep longlining is permitted*	*Fatty, melting flesh*
Blue/fringe ling	*Growing deep-sea species slow* *Satisfactory stock: Norwegian Sea and Northeast Atlantic (where measures to reduce fishing effort and ban discards of profitable fish are quite effective).* *Overfished stock: Iceland and Greenland*	*Males:* ***80 cm*** *Females:* ***90-100 cm*** *Recommended allowable catches regularly exceeded, many by-catches*	*Northeast Atlantic stock considered collapsed*

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

Bluefin tuna	*Species highly threatened by overfishing throughout the world around the world* *The resource has been drying up since the 2000s*	***115 cm***	*Fatty meat, rich in omega-3s*
Stingray	*1/3 of European species threatened according to IUCN* *Overfished but not endangered stocks in Europe curly stingray, soft stingray, flowering stingray, brown stingray* *Sustainable stock: Northwest Atlantic; except for skate and ray, which are overfished.*	***40 to 105 cm*** *The low fecundity of stingrays makes them very attractive. vulnerable to fishing activity* *Avoid eating European skates*	*White, slightly pink flesh*
Shark	*1/3 of European species threatened according to IUCN criteria* *Endangered stock: everywhere, especially in seas bordering Indonesia and Spain* *Reconstituted spotted dogfish stocks: Western Scotland/Ireland, Western English Channel, Bristol Channel and Celtic Sea* *Stock of emissole being reconstituted* *Endangered: basking shark, shortfin mako, bigeye thresher, hammerhead, gulper shark, white shark and angel shark* *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).*	*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". "This is not a variety of small salmon!* *Avoid fin soup, especially in Asia, as it is directly linked to overfishing of the species.* *Species highly sensitive to the effects of overfishing due to late maturity and slow reproduction.*	*Low-fat flesh, ammonia taste,* *rich in vitamin A and protein*

Table 10:

THE DIFFERENT FISHING TECHNIQUES USED TODAY

Types of fishing	***Great fishing***	*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****.* *The species caught vary according to the fishing zone (trawlers head for* ***cold seas*** *to catch* ***saithe, 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****).* *In Europe, there are just over 150 vessels of this type,* ***representing less than 0.2% of the total number of vessels. the entire European fleet and 28% of all fish caught****.*
	Offshore fishing	*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.* *These vessels cruise off the coasts of Europe, catching 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****.* *They represent* ***7% of the European fleet, but 52% of the total fish caught in Europe*** *(by weight).*
	Coastal fishing (or intensive artisanal fishing)	*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****.* *These boats alone represent* ***more than half the European fleet, but only less than 10% of the total fish caught in Europe****.*
	Small-scale fishing	*In small-scale fishing, the "tide"* ***may not exceed one day*** *(fishing trip of less than 24 hours). 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****.* *These boats represent* ***33% of the European fleet, but only 1% of the total fish caught in Europe****.*
Fishing techniques	***Trawling***	*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.).* *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 coral and sponge colonies. Not to mention the fact that trawling results* ***in much higher by-catch discard rates than handline and pole fishing****.* *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 cause slightly less damage to the seabed, 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.*
	Purse seine fishing	*These rotating rectangular nets, with which ships encircle schools of fish in open water,* ***can be over 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 sardines.... It is commonly used in minnow fishing for small pelagic fish or sand eels.* ***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).*

Fishing techniques		
	Fishing with straight and gillnets	*Gillnets are straight nets, i.e. rectangular webs stretched upwards by a rope equipped with with floats and a weighted rope at the bottom, used for fishing sole, cod, hake...* *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****.*
	Longline fishing	*This fishing method consists of attaching several hooks fitted with bait along a master line. can measure up to 20 km and carry 12,000 hooks with sardines and squid as bait.* *It poses a problem insofar as it leads to numerous by-catches of seabirds, fishes and other species. sharks, sea turtles, etc.* *The use of circle hooks reduces accidental catches and the setting of longlines at night. reduces bird catch.*
	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).*
	< Techniques to be prohibited > ***Dynamite fishing***	*In some parts of the world, explosives such as dynamite are used to kill fish in order to float to the surface and can be easily harvested by nets.*
	Cyanide fishing	*Cyanide is still used in some countries to stun fish, making them easier to catch.*
	< Shellfish fishing > ***Dredge and trap fishing***	*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 are textile or metal mesh bags dragged along the seabed to capture various shellfish (scallops), sometimes buried in the sand (clams, cockles, etc.). Because they stir up the seabed, they can destroy ecosystems if used unreasonably.*

Sources :

- http://bluefisheurope.org/
- https://www.msc.org/fr/nos-actions/les-oceans-en-danger/surpeche-peche-illegale-et-destructrice
- https://www.formation-maritime.fr/51-peche-maritime.html?start=4
- https://www.viande.info/la-peche

Table 11:

LABELS AND CERTIFICATIONS FOR SEAFOOD PRODUCTS

Ecolabels for fish products	***MSC label***	*__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 foods__.* *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 leading labels in this sector, and __focuses on "good stock management". Today, around 20% of fish caught by French fisheries hold this label. To__ date, over 37,000 products made from wild-caught resources worldwide carry the MSC label: 3,500 in France, 1,306 in Switzerland, 1,398 in Belgium and 4,697 in Germany.* *The three main principles of the label are :* • *Sustainable fish stocks.* • *Minimized environmental impact.* • *Effective fisheries management.*
	ASC label	*A cousin of the MSC, it was created in 2010 by an NGO to __target aquaculture products. It guarantees that fish is produced with respect for the environment and in 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.__*
	Pavillon France" label	***"Pavillon France"** is supported by the interprofessional association "__France Filière Pêche", which brings together__ producers, wholesalers, processors, retailers and fishmongers in France. The aim of this association is 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.__*
	Label "Artysanal	*Created by the World Forum of Fish Harvesters and Fishworkers in 2013, it concerns boats under 14 m 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 Artysanal label criteria, and the Elior group (corporate catering) has joined the initiative.*
	Sustainable fishing" label	*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.* *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.* *Please note that this is not an environmental label guaranteeing the sustainability of fisheries or species. captured.*

B2B aquaculture labels	***GAA (Global Aquaculture Alliance) label***	***Global Aquaculture Alliance is an international non-profit association dedicated to develop environmentally and socially sustainable aquaculture.*** *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 at present no fewer than 700 companies are GAA-certified.***
	Label Global G.A.P.	***GLOBAL G.A.P. (Good Agricultural Practice) is a private organization that sets certification standards for agricultural and aquacultural 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.***
Ecolabel for products from aquaculture	***AB" label***	*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 1er 2010.* ***The European label appears on products in addition to, or in place of, national labels.*** ***This certification ensures that farmed fish are raised in compliance with strict criteria:*** • *no use of pesticides, colorants, chemical growth stimulants and limited use of antibiotics;* • *plant supplements from organic farming (GMO-free, in particular);* • *animal feed from fish products subject to quotas ;* • *lower cage density than in conventional farming to respect animal welfare.* *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.).*
Other eco-labels	***Friend of the Sea" label***	*Friend of the Sea certifies both* ***fish and farmed fish products, in accordance with the FAO eco-labeling code of conduct****. In addition to fishery products, products used to feed farmed fish (meal, oil, feed, etc.) can also be certified.*
	Label "Naturland	*This German organization has developed standards for the certification of fishing products in developing countries (Nile perch in Tanzania), but also 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.*** *For aquaculture products, Naturland standards for organic fish farms are* ***present in some twenty countries, and exist for certain farms raising trout, salmon, shrimp, tilapia or pangasius.***

	Dolphin Safe" label 	*This is the name of a campaign launched by the Earth Island Institute (EII) in the USA and relayed by WWF in the 1990s 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.*** *This label on cans indicates that the tuna has been* ***caught using techniques that do not harm dolphins*** *(but does not guarantee against the possible capture of other endangered species such as sharks and sea turtles).*
Additional information	***No DCP" mention***	*Some cans of tuna (yellowfin, albacore, etc.) are now labelled* ***"line-caught".*** *"This means that the fish were caught without the use of a* ***"fish aggregating device" (FAD).*** *This means that the fish have been caught* ***without the use of a "fish aggregating device" (FAD)****. FADs lead to changes in fish behavior and unwanted catches, and although their ecological impact has not been fully identified, it is preferable to avoid altering the natural functioning of fauna and flora.* ***Please note that this is a reference to the fishing technique used, not a certification or ecolabel.***
	Label Rouge	*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).* ***It certifies compliance with very strict specifications, but only guarantees the quality of the food, not whether it is organic or not.***

Sources :

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

Table 12:

BENEFITS AND DRAWBACKS OF SEAWEED	
BENEFITS	**DISADVANTAGES**
• **low calorie and fat content** Contain **only 1 to 5% fat,** depending on the species, and some algae (notably **red algae**) are **high in omega-3 fatty acids**.	• **allergenic potential** **Not all seaweed is edible,** and some can **cause allergies**. Before consuming them for the first time, it is advisable to check that your body is not over-reacting to their consumption.
• **high levels of protein, calcium and fibre** Seaweed contains **between 8 and 70% protein, depending on the species** (in ascending order, brown, red and green seaweed) → **direct competition with leguminous plants, and wholegrain cereals**, even if they are **less digestible** for our bodies than animal proteins, with the exception of	• **high iodine content** While iodine is **essential for the proper functioning of the thyroid glands, too much of it can cause them to go haywire,** leading to hyper- or hypothyroidism.

spirulina (its digestibility is 60%, higher than that of the others). They also contain **between 35 and 40% fiber**, **equivalent to 1 kg of vegetables**. Seaweed also helps to **combat constipation, regulate blood sugar levels and fight cholesterol**. What's more, seaweed contains **3 to 14 times more calcium than milk**, led by wakame and kombu → an **8 g** serving **o f dry seaweed provides more calcium than a cup of milk**.	
• **lots of iron, minerals and vitamins** Seaweed has a much higher iron content than the famous spinach: every 100 g of spinach contains 2.7 mg of iron, compared with **up to 200 mg in the case of sea lettuce,** for example, **even though iron is a little less easily assimilated by the body**. Not to mention the fact that algae have the ability to "This is why they are so **rich in minerals and trace elements, accounting for up to 34% of their 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!	• **their incompatibility with an anticoagulant regimen** The vitamin K contained in seaweed promotes blood coagulation. People on anticoagulant therapy should avoid consuming it, as it may counteract the effects of their medication.
• **gelling, thickening and stabilizing properties** Gelling consistency **7 to 8 times greater than pork gelatin;** can be used as a thickener for sauces, soups or purées, for example; seaweed can be used to **preserve food longer** or **intensify** its **colors → more environmentally friendly and healthier solution** of a from an agri-food perspective.	• **heavy metal pollution** **Algae tend to store pesticides and heavy metals contained in the waters where they grow** → pay attention to the pollution level of the water they come from to avoid absorbing excessively high rates.

Table 13:

	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
Fruits (suite)	Pamplemousse	**506** L/kg
	Apple	**822** L/kg
	Poire	**922** L/kg
	Apricot	**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
Légumineuses	Dry beans	**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
Epices et aromates	Café	**15 897** L/kg
	Cocoa beans	**19 928** L/kg
	Cocoa powder	15,636 L/kg
	Chocolate	17196 L/kg
	Tea	**8856** L/kg
	Poivre	**7611** L/kg
	Vanille	**126 505** L/kg
	Cinnamon	**15 526** L/kg
	Clou de girofle	**61 205** L/kg
	Nutmeg seed	**34 319** L/kg
	Anise, star anise, fen	**8280** L/kg
	Menthe	**288** L/kg
	Gingembre	**1657** L/kg
Sucres	Canne	**210** L/kg
	Beet	**132** L/kg
Tubercules	Pomme de terre	**287** L/kg
	Cassava	**563** L/kg
	Igname	**343** L/kg

Table 14:

Produit	*Meilleures conditions climatiques de production*	*Pays de provenance et producteurs conseillés*	*Critères de production bio*
Cacao (chocolat)[1]	- Est cultivé de nos jours sur tous les continents aux latitudes tropicales car nécessite un climat chaud toute l'année (de 23 à 28 °C) et très humide avec des précipitations annuelles d'au moins 1 500 à 2 000 millimètres. - Sa culture est souvent pratiquée sous l'ombrage et la protection d'arbres plus élevés de la forêt tropicale (les « mères cacao ») pour le protéger des vents violents et les rayons de soleil directs	Production bio dans le monde (0,5% du marché mondial du cacao) : - Amérique latine (90% de l'exportation mondiale), Nicaragua et Costa Rica (mais destinée aux marchés locaux) - Afrique (Ghana, Nigeria, Côte d'Ivoire, Cameroun, Congo, Madagascar) - Vietnam (depuis 2011), Vanuatu (1/5 hectare en bio en 2010) - Caraïbes (Jamaïque, Haïti, Grenade, Trinité)	Le chocolat bio AB respecte la Directive Européenne CE 2092/91 concernant le mode de production : - Chaîne de production et de conditionnement avec un étiquetage mentionnant le numéro de l'organisme de contrôle auquel le producteur est soumis (traçabilité) - Plantation exempte d'engrais chimiques depuis 5 ans et aucun produit chimique autorisé pour produire le chocolat
Café[2]	- Nécessite des températures subtropicales presque tempérées entre 18 et 25C° pour pousser - Le café craint les extrêmes de température mais a besoin de pluies abondantes et bien réparties (durant la période sèche les rosées nocturnes sont très bénéfiques) ainsi que de l'ombrage - Ne peut donner une bonne récolte annuelle que dans un sol pauvre, perméable, dérivant de la décomposition de roches volcaniques et légèrement argileux/sablonneux	- Indonésie, Panama, Jamaïque, Ethiopie, Brésil - Pays producteurs de café bio : Honduras (volume doublé entre 2010 et 2012), Mexique, Ethiopie, Pérou (3/4 de la production mondiale de café bio se trouvait en Amérique latine en 2008)	- L'IFOAM (l'organisme international de direction, d'union et de soutien à la culture biologique dans le monde) exige que le café bio soit dépulpé, séché et mis en sac de jute « par des moyens exclusivement naturels » et qu'il soit produit sans avoir recours aux OGM ni aux pesticides (interdiction d'utiliser des produits chimiques depuis au moins 5 ans sur la plantation, seulement les engrais organiques autorisés) - Traçabilité fournisseur : un café bio doit obligatoirement obtenir une certification dans son pays de production et une autre dans son pays de torréfaction[1]

Noisette[6]	Climat doux et relativement humide (océanique, bord de mer)	-Origine France : majoritairement en Aquitaine et en Lot-et-Garonne - Turquie, Italie, Sicile (premiers producteurs aussi pour le bio)
Noix de muscade[7]	Climat tropical : Zones chaude et humides	- L'archipel des îles Moluques - Sri Lanka, Kerala (sud de l'Inde), Indonésie
Noix de cajou[8]	- Climat chaud et ensoleillé (besoin d'au moins 6 heures de soleil direct par jour) - Température adaptée : 25°C mais peut supporter aisément des températures de 10°C à 40°C	- La production des pays africains représente 36% de la production mondiale (notamment le Mozambique) - Privilégier les pays producteurs et transformateurs (le Vietnam, Brésil et l'Inde)
Cannelle[9]	Arbre qui pousse dans les forêts sauvages sous un climat tropical (zones chaudes et humides) avec une récolte qui se fait tôt le matin, généralement au printemps, les jours de pluie	- Ceylan (produit la variante la plus qualitative du marché) - Productions les plus écoresponsables : Indonésie, Sri Lanka, Seychelles, Madagascar - Eviter la Chine, le Laos et l'Inde
Vanille[10]	- Besoin d'un climat tropical chaud et humide sous des latitudes comprises entre 25°N et 25°S avec des précipitations de l'ordre de 2 000 mm par an - Pousse jusqu'à une altitude d'environ 1000 mètres, tant que les températures se situent entre 20 et 30 °C.	- Les Etats-Unis, la France et l'Allemagne sont les trois principaux exportateurs de vanille au monde et les trois principaux réexportateurs (représentent environ 80% du commerce mondial de vanille à eux trois) - Productions les plus écoresponsables : Madagascar (bio à plus de 85%), la Réunion, Mayotte

Sources :

1- https://www.natexbio.com/cacao-bio-23-des-surfaces-mondiales-de-cacaoyers/#:~:text=The%20cacao%20produces%20in%20Am%C3%A9rica,in%20Mexico%20and%20in%20Bolivia. https://www.universalis.fr/encyclopedie/cacao/2-les-conditions-climatiques-de-la-culture-du-cacao/#:~:text=The%20cacao%20is%20of%20our%20500%20C3%A0%202%20000%20millim%C3%A8tres ;

2- Fédération des transformateurs et distributeurs bio (Natexbio), "Le café bio", March 25, 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://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%20tons.

6- Interfel website and 2017 FAO data taken from the Gastromaniac website.

7- Syndicat national des transformateurs de poivre, épices, aromates et vanille (SNPE) and Syndicat national des fabricants de mélanges technologiques pour l'industrie alimentaire (SYMTIA), "Nutmeg", Newsletter No. 10, November 2018 (https://www.jardinsdefrance.org/la-production-mondiale-depices/ fedalim.net/wp-content/uploads/2018/11/FEDEMET10.pdf).

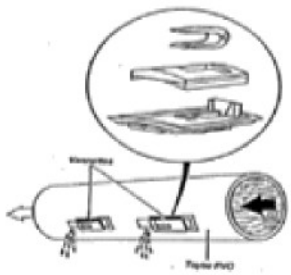
8- Écocert France website.

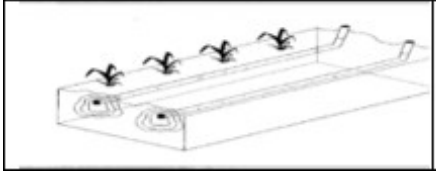
9- CIRAD website (agricultural research for development).

10- Web-magazine Ingrebio (https://ingrebio.fr/tag/vanille/) and Consoglobe website.

Spray irrigation	Lsrrtgatiorc par aspœsÎorr est tEtŒniquæ d'zrrigatîorc **par laquelle Feau** est Bpppïtèe aux plantes sous la fôrm e dê pluiè aFÔfîciellê et qui test rapidœnertt déu'èîo êp apñêî ¥a 2nôe GM räotammem "dÀrls les rJËgÏÖns arides "et.semi artdæs d'Europe et des Etats-Unis.	
-w W """"	**Rampe fixe ou** pfrmanerrte	Semi-pcirtuous or patented, the Ramps are buried at regular intervals.
  - "	Railings piuotances	Automated, a ramp rotates around a pivot £kxe. œtte irrigafion circulaire convient à tout type de cu lture en plein Ehamp car permet une application préÔse de I "eau insensible a u vent It is also one of the most widely used, along with central pivot irrigation
	**Rampes frontales**	EiTect automatic al1ers-retou re mechanized spraying in the field
	RürrigaEîon ramps on pivot	The farmer moves a tractor equipped with a wheel around t h e areas to be irrigated
	Winders	A long, rolled pipe connected to the Ö water network as a a classic garden h o s e . It is then handled by farmers at the hand. The most widespread in the world, with more than half of irrigated land œr it is ada ptabJe to the plot and œùt of moderate maintenance

Table 15:

L'irrigation de surface	L'irrigation de surface fonctionne optimalement sur des champs en pente pour irriguer un ou plusieurs de ses sillons : l'eau s'écoule librement sous l'action de la gravité, avec comme moyens de transport et de distribution la surface du champ, ce qui permet de gérer l'eau avec plus de flexibilité et un débit unitaire considérablement réduit	
	**Irrigation** with	Water supply to long, sloping rectangular plots via drainage at the lower end of the charrip The water spreads in the various grooves of the planks-plots using planks to water the soil thanks to the gradient; very suitable for most t:yp es of crops and s als, **especially** Eeux with slow infiltration speed and tolerance to prolonged
	**Irrigation par bassin**	Complementary irrigation based on collecting and then distributing the various types of runoff water, in particular runoff from the land *surrounding* the basin and from crops.
Irrigation à la raie	L'eau couvre partiellement le sol puis s'infiltre et remonte par capillarité	
	**Siphon irrigation**	Connects the basin directly to the areas to be watered via feed channels The water then flows away under gravity autour du champs.
	**Boom** irrigation	More precise and constant adjustment of water discharge rate, but need to study the necessary sizing
	**Irrigation par gaine souple ou transirrigation** (tuyaux rigid)	Similar to siphon irrigation, but for flat terrain. Pipes with calibrated orifices run through each row and release water regularly. Inexpensive and easy to set up, but rather fragile with an imprecise flow rate

L'irrigation au goutte à goutte	L'irrigation au goutte à goutte a une application lente et localisée avec un débit prédéterminé à travers des goutteurs, ce qui nécessite des investissements assez élevés mais pour un résultat très économe en eau. Née en Israël dans les années 60, elle s'est ensuite exportée surtout vers l'Afrique (notamment le Kenya) mais aussi dans le maïs, les vignes et les vergers du sud de la France, en manque d'eau.	
Par voie externe		
	**Goutteur/gaine à circuit long ou court**	Petit organe à paroi fine posée à même le sol et destiné à délivrer ponctuellement un lent et régulier de quelques litres d'eau par heure. A poser avec précaution car fragile même si peu onéreuse
	**Diffuseur**	Asperseurs statiques placés à 0,4 m au-dessus du sol et qui pulvérisent l'eau sur une partie de la surface du sol au niveau des cultures concernées
	**Orifice calibré/ajutage**	Disposé sur une rampe d'arrosage à intervalle régulier avec un débit contrôlé
Par voie souterraine		
	**Irrigation par gaines enterrées**	Irrigue à environ 30-40 cm de profondeur au plus près de la racine, mais exclue la possibilité de travailler le sol profondément (oignons ou de pommes de terre)
	**Irrigation par vases céramiques poreux**	Utilisée au Proche-Orient et en Afrique du Nord
	**Irrigation par tuyaux poraux sectionnés**	Utilisée au Zimbabwe, elle irrigue deux rangées de plantes avec un seul conduit souterrain planté de part et d'autre du tuyau

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 ;*
- *"Evaluation of water savings at plot level that can be achieved by modernizing irrigation systems", study carried out with the support of the French Ministry of Agriculture. l'Agriculture et de l'alimentation, September 2017.*

Table 16:

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

Table 17:

Types of filtration	Benefits	Disadvantages	Cartridges filtering	Benefits	Disadvantages
All types of carafes	*Better microbial quality than in an unfiltered glass carafe (- 6 CFU / mL beyond day 7e for filtered water vs. 300 CFU / mL for unfiltered water at the same temperature).* *The report submitted by the INC (2011) indicates that nitrate reductions are between 8 and 17% for cartridges that do not specifically claim to eliminate nitrates.*	*Chlorine reduction of at least 70% over the life of the cartridge, often exceeding the minimum 80% removal rate recommended by the standard. NF P 41-650.* *Metal filtration often lower than that recommended by the above-mentioned standard, i.e. 80% for Cu and 90% for Pb over the entire life of the cartridge.* *Tapering elimination rates :* *- 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;* *- for magnesium: decline identical to that for calcium.*	***Basic 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.* *Low initial cost if resin is highly acidic and completely eliminates cations.*	*Partial elimination of cations at high initial cost in the case of a weakly acidic resin that can only be used with specific waters.*
			Filter treated with money	*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 cartridges).*	*Although effective, some chemical researchers consider this device to be more appropriate for NGOs than for everyday water treatment[1] .*
	Benefits	**Disadvantages**	**Filter beads**	**Benefits**	**Disadvantages**
Faucet/showerhead-mounted filter	*Moderate cost.* *Filtered water is continuously available at the tap, and the device does not need to be changed once installed.*	*If the filter is not properly maintained, there is a risk of bacterial growth.*	***White ceramic*** *(Japanese ceramic beads)*	*Purify water by removing limescale, chlorine and other residues (a growing success in over 120 countries worldwide).*	*Lack of scientific studies on the subject, but help save water when present in a showerhead filter.*
			Germanium *(rare grey-white, brittle metal with the same structure as diamond)*	*Purifies water by neutralizing impurities, germs and residues from tap water. Germanium beads remove limescale, chlorine and heavy metals.*	
			Red tourmaline	*Effectively filters impurities, heavy metals and pollutants from water thanks to the porosity of the mineral.*	

Piece of activated carbon (powder, granules or stick)	*Removes fine and organic particles, chlorine and pesticides.*	
	Dissolves metals such as nickel.	*Takes several hours to filter water.*
	Rebalances pH and releases minerals essential to health.	*Increased pH, but no harmful effects reported.*

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-efficiency-pollutants/
- https://www.bwt.com/fr-fr/blog/articles/cest-quoi-l-eau-filtree/
- https://www.cdiscount.com/bricolage/sanitaire-salle-de-bain/l-ioniseur-d-eau-de-filtre-de-tete-de-douche-de-ge/f-166100109-auc0736561354442.html

Table 18:

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 transplants of genetically modified animals in humans.*	*While GMOs can reduce the use of insecticides, they are insensitive to herbicides, which **can lead farmers to spray more than necessary** (the same would apply to insecticides, as many insects develop tolerance, or even resistance, to the insecticide produced by the GMO plant).*
*GMOs enable the emergence of varieties with **superior characteristics to those of so-called normal plants, for** example by increasing their nutritional quality (notably 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", for example through 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 GMO plants have been designed to **remedy environmental pollution problems** (e.g. a poplar genetically modified to clean the soil of heavy metal contamination).*	*Growing GM crops means **farmers become dependent on them**: as the seeds are sterile, they have to buy new ones every year (with ever-increasing doses of pesticides).*

Source: FAO (https://www.futura-sciences.com).

Table 19:

	Benefits	*Disadvantages*
Oil peanut	***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 legume, peanuts are also **high in vegetable protein**.* *Thanks to their high protein content, peanuts and peanut oil can replace all or part of meat and fish. They can be used for deep-frying, stir-frying, pan-frying and salad dressing.* *Its neutral taste is suitable for all foods. It can also be used for cooking, as its properties are heat-stable.*	*Because of its **susceptibility to oxidation** when heated to high temperatures, it should not be used for frying.* *If you are allergic to peanuts, avoid eating them.*
Oil lawyer	***This vegetable oil can be used in cooking**, as it contains the same benefits as organic olive oil. Ideal for fried dishes or pastries, it can also be used on bread or salad. Be careful, however, to add the right amount of oil to your ingredients, as avocado can add a touch of acidity.*	*Avocado oil presents no health risks, **provided you don't overheat it and you're not allergic to latex and/or exotic fruits.** Avocado oil contains hevein,* *a component also found in bananas, kiwis, etc.*
Rapeseed / canola oil	*With its neutral taste, this edible oil is nutritionally 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.* *"If we wanted to formulate an ideal oil, we wouldn't go far wrong with rapeseed"[2] , 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).* *Does not denature during cooking and can be used for pastries as well as pan-frying vegetables.*	*The composition of vegetable oil is strongly influenced by production conditions. To ensure its quality, we recommend that you select a cold-pressed, extra-virgin oil, ideally of organic origin.* *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.*
Palm oil	*Good source of nutrients, rich in saturated fats and therefore solid, stable, not very sensitive to oxidation and rancidity, resistant to heating.*	*Its cultivation is very bad for the environment (as explained above). in this chapter).* *Rich in saturated fats and therefore likely to raise LDL cholesterol when consumed in excess.*
	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 a lower risk of heart disease.	*Contains almost no omega-3.*

Olive oil	*total and LDL ("bad") cholesterol levels in the blood.*	*Olive oil contains 77% oleic fatty acid, which promotes blood clotting: ingesting too much olive oil can lead to poor blood circulation.*
Sesame oil	*A uniquely mild and sweet taste, very popular in Asia.* *Known for its dermatological benefits, sesame oil can also be used in a wide range of dishes. It adds a distinctive aroma and sesame seed aftertaste to your dishes.* *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...* *This oil contains sesamolin and lecithin, which may strengthen nerve and brain cells. Its good fat content also helps lower cholesterol. However, sesame oil should be avoided by children and pregnant women.* *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 can find it in parapharmacy, organic stores and on the Internet. If you need cooking oil, unroasted sesame oil is ideal, as it withstands heat better than roasted sesame oil, which is used only for seasoning.* *Protected from light, humidity and heat, this oil can be used for keep for several months.*	*For certain categories of people, sesame oil consumption should be limited or eliminated. There are relatively few contraindications, but if you have one or more in the list below they should be taken into account:* • *children's age (up to 1 year);* • *varicose veins ;* • *kidney disease (stones, sand), gallbladder and liver disease ;* • *high blood coagulability ;* • *tendency to diarrhea ;* • *peanut allergy ;* • *at the same time as taking aspirin / consumption of foods containing oxalic acid (spinach, cucumbers, etc.), as there is a risk of urolithiasis* *Sesame seed oil should not be taken with acetylsalicylic acid (aspirin) and other medicines containing this substance. If you are allergic to peanuts, this product should be completely excluded from your diet.*
Walnut oil	*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.*	*Does not tolerate 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.*
Linseed oil	*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!* *Its richness in omegas-3 and omega-6, which are essential 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.* *It also contains many vitamins, such as A, E, B and K.*	*Consume only cold and within three months of opening. (can become toxic once rancid).* *Particularly unstable, heat-sensitive and easily oxidized.*
	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. *This oil has a particularly high content of mono- and polyunsaturated fatty acids (73%), essential for the body. Its*	*Contested in the virtues and health-promoting properties that it lend.* *Made using **polycyclic aromatic hydrocarbons**, recognized as **carcinogens**.*

Grape seed oil	*Its natural detoxifying virtues and anti-cholesterol properties reinforce its action in the prevention of cardiovascular disease.* *Grapeseed oil withstands high temperatures without denaturing.*	
Corn oil	*Corn oil is good for everything, easy to use and appeals to everyone because it doesn't taste like much. What's more, it keeps well. Thanks to its vitamin- and fatty acid-saturated composition, this oil :* • *has a choleretic effect and reduces the risk of cholecystitis;* • *increases the body's resistance to infection, strengthens the immune system;* • *normalizes the functioning of the nervous system, improves memory and concentration;* • *prevents the development of cancerous tumors;* • *has a general reinforcing effect;* • *normalizes metabolism and helps reduce body weight.* *Corn oil is easy to include in your regular diet.* *It can thus :* • *contribute to active muscular work and increase endurance overall body ;* • *fight cholesterol plaque and prevent atherosclerosis (clogging of blood vessels with cholesterol deposits);* • *strengthen the heart and blood vessels and reduce the risk of heart attack and stroke.*	

Table 20:

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

The blue *families can be heard*

get along with each other / reds don't get along with each other

Table 21:

Four categories of vegetables	
Seed vegetables / pod vegetables *(vegetables in which only the inside of the pods are eaten)*	*Peas, beans*
Root vegetables *(of which only the root is consumed)*	*Carrot, parsnip, turnip, radish, beet, salsify, fennel, rutabaga, kohlrabi*
Leafy vegetables *(of which only the leaves are consumed)*	*Cabbage, leek, lettuce, spinach, cardoon, ribbed celery, watercress, fennel, parsley, sorrel*

Fruiting vegetables *(vegetable plant grown to produce fruit)*	*Tomato, squash, zucchini, cucumber, melon, eggplant, gherkin, bell pepper, chilli, avocado, olive*

Table 22:

Storage space	*Temperature*	*Products*
Refrigerator top: Cold zone	*0°C to 4°C*	*- Meat, cooked and cooked meats, poultry, fish* *- Fresh delicatessen products, creams, fresh and raw milk cheeses, dairy desserts* *- Defrosting products, opened fresh products,* *- Fresh fruit juices, packaged salads*
Center of refrigerator: Cool zone	*4°C to 6°C*	*- Home-made preparations* *- Cooked vegetables and fruit* *-Cooked meat and fish* *- Yogurts and cheeses made from scratch*
Refrigerator crisper	*8°C to 10°C*	*-Washed fresh fruit and vegetables* *-Packaged cheese to finish maturing*
Refrigerator door	*6°C to 8°C*	*-Eggs, butter, milk* *Well-sealed opened fruit juices*
Pantry	*Maximum 25°C*	*-Tomatoes, cucumbers* *- Zucchinis, eggplants, squash* *- Peaches and stone fruit* *-Melon, watermelon, banana, avocado* *- Gherkins* *- Garlic, onion, basil* *-Eggs* *-Chocolate, coffee, honey*

Table 23:

Raw materials scrap	***Appetizers***
Bread	*Breadcrumbs, toast, pudding, French toast*
Chicken	*Rillettes*
Vegetables	*Velouté, mousse, purée, flan, fonds*

Fish	*Rillettes, soup, fumet*
Meat	*Parmentier, stuffed, bolognese, terrine, stock*
Vegetable trimmings	*Syrup, sorbet*

Table 24:

Economic impact of a 50% reduction in food waste				
Number of meals	*Quantity of food waste*	*Economic loss*	*Water consumed by waste*	*Eq-CO_2 emitted from waste*
Customer scale				
1 classic meal	*130 grams*	*26 centimes*	*25 liters*	*325 grams*
1 meal reduced waste	*65 grams*	*13 centimes*	*12.5 liters*	*1.625 kilo*
1 year of classic meals	*94.9 kilos*	*189.8 euros*	*18,249.27 liters*	*237.25 kilos*
1 year of meals reduced waste	*47.45 kilos*	*94.9 euros*	*9,124.63 liters*	*118.62 kilos*
Restaurant scale (multiplied by 120 place settings)				

1 day of classic service	*15.6 kilos*	*31.2 euros*	*2,999.88 liters*	*39 kilos*
1 day of service reduced waste	*7.8 kilos*	*15.6 euros*	*1,499.94 liters*	*19.5 kilos*
1 year classic service	*5,694 tonnes*	*11,388 euros*	*1,094,956 liters*	*14.235 tonnes*
1-year service reduced waste	*2.847 tonnes*	*5,694 euros*	*547,478 liters*	*7.117 tonnes*

Table 25;

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 m²
1 meal at 130 g	41,99 m²
Difference	22,61 m²
1 year at 220 g	47 158 m²
1 year at 130 g	30 652,7 m²
Difference	16 505,3 m²
Restaurant scale (multiplied by 120 place settings)	
1 day's service at 220 g	7 752 m²
1 day's service at 130 g	5038,8 m²
Difference	2 713,2 m²
1 year service at 220 g	2 829 480 m²
1 year service at 130 g	1 839 162 m²
Difference	990 318 m²

Table 26:

Impact of 130g of meat on the amount of water used for animal feed		
Quantity of meat	Water consumption for beef	Water quantity average consumption cattle, sheep, pork, poultry
Consumer scale		
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
Restaurant scale (multiplied by 120 place settings)		
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

Table 27:

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
Difference	442.8 kilos

1 year service at 220 g	395,076 kilos
1 year service at 130 g	233,454 kilos
Difference	161,622 kilos

Table 28:

Impact of 130g of meat on the quantity of eq-C02 emitted	
Quantity of meat consumed	Eq-CO2 emitted
Consumer scale	
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
Restaurant scale (multiplied by 120 place settings)	
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
1 year service at 130 g	365 554.8 kilos
Difference	79,628.4 kilos