



FOODYOUNG

PARTNERS IN TASTE

Environmental Guidelines 2017

A conscious approach towards managing our ecosystem is required in order to ensure the health of our environment. As humans on this planet, we cannot live without air, water, cultivatable soil and food, and we have to be able to co-exist with many other livings (flora and fauna). However, by over-consuming available resources, polluting the environment and destroying life around us, we are not just threatening the survival of the environment and other livings, but putting our own survival in danger. FoodYoung, as a pioneering Swiss food group, is dedicated to find a balanced and respectful approach towards environmental health and building a sustainable ecosystem and applying it across its core brands and portfolio ventures. For this purpose, FoodYoung, in collaboration with Chemist and Environmental Engineer Dipl. EPFL Olivia Grebler, Founder and CEO of Biolia and the Ecocook programme, has developed the following guidelines.

In Part 1 we present the characteristics of sustainable practices in the food industry, in Part 2 we explain why to urge in matters of managing resources (air, water and soil) efficiently, in Part 3 we talk about the behaviour we need to apply to achieve sustainable consumption, and finally in Part 4, how we can build harmonious relationships between plants, animals and humans.

Part 1: Sustainable practices in the food industry

Practically, it is important to focus on sustainable agricultural practices for the sake of human beings and their environment, and optimise our consumption of resources as much as possible.

1.1 Food and beverages

It is not only crucial that the production processes of ingredients for our meals and beverages harm the environment, the human and animal welfare and health as little as possible, but also that the meal and beverage preparation processes are harmless and ingredients used are pure and healthy.

Organic production

There are many different certifications for organic agricultural practices.

It is important to know that Organic ("Bio") labels are not all equally taking into account environmental protection and social responsibility. For example, the Organic label from the European Union is often considered as not strict enough. There are many other organic labels in European countries, such as Bio Cohérence in France, or Naturland in Germany that are stricter. The Swiss organic bud is considered one of the strictest in Europe. Moreover, there are many labels globally that do not mention the words "organic" or "bio", but whose criteria are more sustainable than those of the EU organic farming labels, for example Demeter (biodynamic agriculture), Max Havelaar (Fair Trade), IP-Suisse (Swiss integrated agricultural production), or MSC and ASC (fisheries and farmed fish), according to a recent Swiss study [1]. American organic products (USDA Organic) are considered as compliant with the EU organic farming label, with the exception of apples and pears in case they are treated with the antibiotics Tetracycline or Streptomycin [2]. We recommend to consider the standards of the EU organic farming label as the lowest benchmark possible for the production of sustainable meals and beverages, and to encourage or combine with the stricter standards.

Meals and cooking

In addition to respecting sustainable agricultural practices, it is also recommended to prepare healthy and well-balanced meals. Fresh ingredients should be used instead of pre-cooked or deep-frozen products. A study from the Harvard Medical School recommends the following ingredients and proportions for a typical meal (one plate) [3]:

- Fruits and vegetables: $\frac{1}{2}$ of the plate (potatoes do not count as vegetables)
- Whole grain: $\frac{1}{4}$ of the plate (whole wheat, barley, wheat berries, quinoa, oats, brown rice, etc.)
- Healthy protein source: $\frac{1}{4}$ of the plate (fish, chicken, beans, nuts, etc.). Give priority to vegetables over meat
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- Healthy plant oils need to be cold-pressed and consumed in moderation (olive, canola, soy, corn, sunflower, peanut, etc.)
- Water as the preferred drink, avoid sodas and other sugary drinks

It is also advisable to limit salt, and avoid cooking methods with high temperatures such as barbecues, whose temperature can rise up to 500 °C. At these temperatures, vitamins are degraded and harmful compounds can be generated. Also, in general fats (less than 30%), sugars (less than 5-10%) [4], refined ingredients (white sugar, white flour, white pasta, oil), and fried dishes should be limited.

When defining personal healthy eating habits, some aspects need to be taken into account, for example:

- Gender
- Age
- Height
- Physical Activity
- Individual's metabolism
- Allergies and intolerances: milk, gluten and food additives are often associated to them
- Dermic pathologies: once more, they are often associated to highly allergenic ingredients

Special attention must also be given to food additives. Food additives are substances added intentionally to foodstuffs to perform certain technological functions, for example to colour, sweeten, enhance flavour, or to help preserve foods [5].

In the European Union all food additives are identified by an E number. Food additives are always included in the ingredient lists of products in which they are used. Product labels must identify both the function of the additive in the finished food (e.g. colour, preservative) and the specific substance used either by referring to the appropriate E number or its name (e.g. E415 or Xanthan gum). The most common additives to appear on food labels are antioxidants (to prevent deterioration caused by oxidation), colours, emulsifiers, stabilisers, gelling agents and

thickeners, preservatives and sweeteners.

Food additives are widely used in the food industry, and some are associated with potential negative health effects such as the development of metabolic syndrome and obesity, as well as liver damage (aspartame), others are associated with allergic-type reactions and child hyperactivity (colorants such as tartrazine (E102) and benzoic acid) [6].

1.2 Packaging

The most sustainable material is a material that is not used, because it avoids the energy needed for its production and disposal, thus it is important to lower the use of packaging as much as possible, and to favour re-usable containers.

Moreover, avoid the use of individual portions (salt, sugar, pepper, etc.). Do not multiply wrappings. For takeaways, use healthy and reusable (or recyclable) materials for bags, food containers and cutlery.

- Bags: prefer cotton to paper or plastic (always from a certified sustainable production)
- Food container: prefer glass or paper/wood/bamboo (always from a certified sustainable production)
- Cutlery: prefer recycled steel cutlery to wood/bamboo (always from a certified sustainable production) or plastic

1.3 Transportation

For foods and ingredients sourced from overseas, plane transport should be avoided as much as possible, as the associated ecological impact is about 25 times higher than transportation by ship. The best case for the environment is to produce and consume locally. However, the benefits of consuming locally sourced products go beyond environmental considerations. Firstly, it allows the use and perpetuation of local varieties. Also, long-haul transport usually implies the harvesting of non-mature fruits and vegetables, which results in a lower quality in terms of taste and nutritive properties. Finally, the use of locally sourced products promotes local economy.

But then again, vegetables transported overseas have a much lower

ecological impact than the local production of meat [7]. Hence, sustainable consumption behaviour requires a general decrease in the amount of meat produced and consumed, especially in developed countries.

Transportation is also closely linked to the problem of animal welfare and spreading of diseases, as slaughter animals often endure very long and painful transports. Each year, more than 3 million animals are exported from the European Union towards Africa and Asia. Even organic labels do not include the control of transportation and slaughter, thus it is important to provide information on the transportation (controls of duration and animal welfare) and location of slaughter [8].

1.4 Living environment

A healthy living environment is crucial. Our living environment is composed of native/autochthon materials and we have to take into account their interaction to make sure that the biophysical properties in the environment are at healthy levels. For this matter, we need to keep the level of noise under 40dB [9], and humidity to 50-55%, while also avoiding any sources of toxic materials (lead in paintings), toxic cleaning products, compact fluorescent lamps (which have shown to lead to burning and be toxic), and control the levels of micro-particles and dust. In terms of decoration, certified sustainable wooden materials should be used for comfort, wellness and lower environmental impacts. This can be combined with metallic materials such as steel and aluminium, which are long lasting and have a high recycling potential (as described in part 3.5).

Part 2: Resource management

By polluting air, water and soil, we are putting life in danger. But the good news is, that we can manage our resources efficiently.

2.1 Air and climate

Air pollution has significant impacts on our health, environment and economy. Pollutants in the air we breathe come from multiple sources,

including sectors such as industry, transport and agriculture. Every day, air pollution causes respiratory and cardiovascular diseases. It also damages vulnerable ecosystems and biodiversity, and leads to a decrease in agricultural crop and commercial forest yields [10]. Agriculture itself is the source of many air pollutants, such as nitrogen compounds, VOCs (volatile organic compounds), pesticides and other harmful chemicals, as well as greenhouse gases such as carbon dioxide (CO₂) and methane (CH₄) [11].

Air pollutants do not have any borders, which is why international coordination of air pollution policy is essential. In order to improve air quality at local, national and global levels, UNECE (United Nations Economic Commission for Europe) member States have developed eight protocols containing legally binding targets for emission reductions regarding Sulfur dioxide, Nitrogen oxides, Non-methane Volatile Organic Compounds, Ammonia, Fine Particulate Matter, Lead, Cadmium, Mercury, Dioxins/Furans, Polycyclic Aromatic Hydrocarbons, Hexachlorobenzene. The result of this collective effort has been remarkable: emissions of a series of harmful substances have been reduced by 40 to 80% since 1990 in Europe. In particular, the decrease in Sulfur emissions has led to healthier anthropic and forest soils. The drop in emissions has reduced the deposition of acidifying compounds to levels below critical loads of acidity in large parts of Europe.

Nitrogen oxides emissions led to a decrease in lead pollution. Lead pollution levels in the UNECE countries were reduced by almost 80% between 1990 and 2012.

One of the big topics we face increasingly these days is global warming. It is principally due to anthropogenic greenhouse gas emissions, mainly carbon dioxide (CO₂) and methane (CH₄). CH₄ molecules have a 30-times higher Greenhouse effect than CO₂. Today, CO₂ levels in the atmosphere are 1.2 times higher than ever recorded in the last 650'000 years on Earth, and CH₄ levels are 2 times higher than ever recorded in the last 650'00 years [12]. While natural greenhouse gases such as water steam are essential to maintain some warmth on Earth, this dramatic increase of anthropogenic greenhouse gases already has an important

impact on the climate and on living beings on earth [13].

The main sources of CO₂ in the atmosphere are fossil fuel use (87 %), land use changes (9 %) and industrial processes (4 %) [14]. Cattle farming itself is responsible for 15 % of the total CH₄ production [15]. There is an urge to change our lifestyle and consuming habits in order to restrain these dramatic climatic changes.

2.2 Soil

Interface between stone and life, substrate for the growth of plants, habitat for numerous living beings, soil is essential for our life, yet it is a non-renewable resource. Once a soil is destroyed, it takes thousands of years to rebuild a new equilibrated soil. Each year 20 million hectares of soils are lost in the world. It is estimated that 25 % of the agricultural soils are threatened by desertification, mainly due to bad agricultural practices leading to erosion, collapsing and pollution [13, 16].

Even in countries with high environmental standards such as Switzerland, all the soils, without exceptions, are contaminated by pollutants, which are accumulating and stay in soils for decades. The most polluted soils are located in settlement areas (gardens and parks), in the vicinity of certain types of industrial and transport facilities, and in special agricultural plantations (fruit production and viticulture, where the soil is heavily polluted). Some measures have allowed to stop the increase of soil pollution, such as substitution of lead in petrol, flue gas treatment in waste incineration plants, and limitation of cadmium level in phosphorous fertilisers [17]. Since 1990, 1000 km² of soils are lost each year in Europe, due to urbanization and road construction [18]. Furthermore, soil losses due to erosion are still ongoing, and soil fertility is decreasing. In the European Union, 50 million hectares of soil are affected by degradation [19]. This is why a change in construction and agricultural practices needs to be undertaken, and regarding agricultural processes, organic and fair-trade production processes should be promoted.

2.3 Water

Water is an essential element for life. Our body is composed of about

60% of water and we need to drink about 2 litres of water per day. Hence, the quality of water has a vital importance for human beings as well as for animals and aquatic organisms.

Sadly, there is a huge list of biological and chemical substances that can impact the quality of surface and groundwater, and consequently potential drinking water supplies. The impacts range from an unpleasant taste to imminent health hazards.

The main sources of water pollution are nitrates, phosphates, pesticides, hydrocarbons (oil spills), faecal microorganisms, heavy metals, plastic waste, and drug residues [20].

Nitrates are the major source of pollution of the world's underground water reservoirs. They mainly originate from massive over-fertilization in agricultural areas. Nitrates are also responsible for bacterial blooms, which severely impact the potability of water [21].

Moreover, about 8 million tons of plastic are discharged in the oceans each year. Plastic micro-particles absorb toxic compounds like pesticides, but also pathogenic microorganisms. They accumulate in the food chain, and eventually end up in our stomachs [22]. Plastic should therefore be replaced by other reusable materials such as recycled glass, wood, or steel, depending on the plastic object to be replaced.

Part 3: Consumption management

In 2016, the Canadian NGO Global Footprint Network set Earth Overshoot Day on August 8. On this date, humanity had consumed all resources our planet can renew in one year. For the rest of the year, we supported our need for resources by drawing down local resource stocks and accumulating CO₂ in the atmosphere. Year after year, Earth Overshoot Day comes earlier [23]. There is an urge to control our over-consumption habits, otherwise we will run out of resources.

3.1 Consume less and educate

It has been shown that the main driver of environmental degradation is not population per se, but consumption patterns multiplied by the number of consumers [24]. But as Einstein said, "Problems cannot be

solved with the same state of mind that created them". Therefore, we need to change our way of thinking. We need to invest in education and awareness in order to consume what we need, instead of "needing to consume what we do not really need". And that is, eliminating the "artificial and superficial need". How? By raising awareness about resources consumption, health impacts and environmental impacts associated with the consumption of a specific product or service. This means, we have to look at the environmental impacts of agricultural/ manufacturing processes, transportation, transformation, conservation, preparation, recycling and/or disposal.

Nevertheless, the point is not to stop all activities, but to improve our consumption patterns in order to find the balance between what is a "basic need", and what is a "luxury" (associated with a momentary pleasure), and "overconsumption". For example, having a mobile phone: Is it a basic need? Well, it is beyond a basic need such as the air we breathe or the water we drink. But most of us need a mobile phone for working purposes, or for security reasons. One compromise can be to buy a mobile phone from a sustainable company, to avoid planned obsolescence and to keep the phone until it is irreparable. Compromises are key in sustainable consumption patterns.

3.2 Reuse

Reusing materials is "almost" the best way to reduce waste and resource consumption. Reusing implies avoiding the manufacturing process of the alternative disposable material and all the resources associated with this manufacturing process, as well as the waste, and the waste treatment process linked to the disposable material elimination treatment (disposal, incineration, etc.). One example is disposable biodegradable tableware versus reusable tableware. Using compostable bamboo tableware can lead to negative environmental impacts such as deforestation, and biodiversity loss. On the other hand, reusable tableware will result in high water and energy consumption due to the washing process. Therefore, reusing does not eliminate negative environmental impacts either, as the reusable material needs to be manufactured and conditioned before it can be used again, which

requires energy and use of other materials as well. However, on average, the environmental impacts linked to disposable materials are higher than those of reusable ones. The best solution is to reduce consumption, and not using materials in the first place, unless really necessary.

3.3 Recycle

Recycling refers to used materials passing through a series of changes or treatments in order to regain material for human use. In 2012, more than 2.5 billion tons of waste were generated in Europe [25], of which only 32 % were recycled. Recently, a waste policy has been established in the European Union, aiming for a recycling rate of 50 % by 2020. Since these Waste Framework Directories were established, recycling rates in Europe have increased [26]. According to the 2015 Bureau of International Recycling, in 2008 the recycling of just seven metals (aluminium, copper, lead, zinc, nickel, tin and ferrous metals) and recovered paper achieved CO₂ emission savings of 501 million tons.

3.4 Organic waste

There are two main ways of recycling organic waste, either by composting or methanisation. Composting allows for the formation of fertile ground for cultures and gardens. However, it is usually not recommended to use cooked leftovers for composting, because of the presence of salt, which could impact the future soil, as well as meat, which could contain pathogenic microorganisms. However, all organic waste can be recycled through methanisation. In this process, organic waste is degraded by microorganisms, thus producing gases such as methane (CH₄) and carbon dioxide (CO₂), which form "biogas". Biogas can be burned in order to produce energy [27].

3.5 Metals

Originally, metals are extracted from mines, in a process that implies the use of high amounts of energy and often the generation of considerable pollution. For example, the recycling of 1 ton of steel saves 1.92 tons of iron ore, 0.63 tons of coal, 11'000 litres of water and 4.46 MW/h of energy, meaning 1.78 tons equivalent CO₂. Apart from steel, aluminium

is the second most recycled metal. Recycling 1 ton of aluminium saves 2.44 tons of bauxite, 1'000 litres of water and 26.59 MW/h, meaning 6.89 tons equivalent CO₂. Metals can be recycled almost 100 %, showing the importance to adopt recycling measures with metals as much as possible [28-29].

3.6 Plastics

Nowadays, plastics are found everywhere, in very diverse products. In 2014, 311 million tons of plastic were produced in the world (59 million tons in Europe), involving the same amount of oil for its production. Nowadays, it is estimated that about 150 million tons of plastic are floating in the oceans, and the amount of plastic waste increases every year. A study from the Ellen McArthur Foundation claims that if nothing is undertaken, there will be more plastic than fish in the oceans by 2050. In Europe, 25.8 million tons of plastic waste were produced in 2014. The plastic recycling rate in Europe is at only 29.7 %, and this number varies a lot between countries. The problem with recycling is, that plastic materials are very diverse, and composite materials cannot be recycled. The average recycling rate of plastics in the world is 5 %. This must be improved a lot.

Plastics are classified in seven groups with an international code number: 1 PET (PolyEthylene Terephthalate), 2 HDPE (High Density PolyEthylene), 3 PVC (PolyVinyl Chloride), 4 LDPE (Low Density PolyEthylene), 5 PP (PolyPropylene), 6 PS (PolyStyrene) and 7 "other" (eg. PolyCarbonate). PET is very commonly used for single-use bottles and meal trays. The problem is, that it can release toxic compounds such as antimony and phthalates, especially when in contact with liquids for an extended period of time or exposed to high temperatures. It is the most recycled plastic along with HDPE.

HDPE is very commonly used for plastic bags, milk bottles, garbage bags, etc. Less toxic than PET, some studies have shown that exposed to sun it could release endocrine disruptors.

PVC is considered the most toxic plastic, but is still present in a wide variety of products such as toys, take-away packaging, shampoo bottles, etc. PVC may release bisphenol A, phthalates, lead, mercury, cadmium

and other toxic substances. Even the manufacturing process is toxic, because of the use of carcinogenic vinyl monomers such as vinyl chloride monomer (VCM). VCM evaporates easily and depending on the type of exposure (breathing, dermic, ingestion or all three of them) as well as the doses, can cause headache, redness and blisters on skin, can damage liver, lungs and kidneys, and even cause death [30]. Moreover the recycling rate of PVC is very low.

LDPE is usually found in plastic films. It is not considered as very toxic, but its recycling rate is very low.

PP is used for similar applications as HDPE, but it is stiffer and more heat-resistant. The toxicity is low, but the recycling rate is also low because it is often mixed with other compounds.

PS is usually used for food containers, egg cartons, take-away containers, helmets, etc. PS containers may release styrene, a carcinogenic compound, which is toxic for the nervous system. The release is higher with hot or oily products. It has a very low recycling rate.

A more ecological alternative to all of these plastic materials is glass or stainless steel [31-36].

3.7 Glass

Glass is a mix of quartz sand, lye and whitewash that is processed at about 1500 °C, which requires a lot of energy. Using recycled glass allows for the saving of one fourth of this energy. Moreover, recycling does not reduce the quality of the glass. In Europe, the recycling of glass is stable, at about 68 % (2012). This allowed for the saving of more than 12 million tons of raw material (sand, lye, limestone), representing 2 sand pyramids!

Glass can also potentially play an important role in the solving of another major issue. Nowadays, sandy beaches are disappearing, because of the massive use of sand for construction and electronic chips. It is estimated that beaches will disappear by 2100 if the use of sand remains the same. However, crushed glass has the same properties as sand, and could be used as a replacement [37-39].

3.8 Paper

The European Paper Recycling Council (EPRC) was set up as an industry self-initiative in November 2000 to monitor progress towards meeting higher paper recycling targets. The current recycling rate is 71,5%, and the 2020 target is set at 74%.

The paper recycling process involves collection, pulping, and de-inking. Some papers, such as newsprint and corrugated materials, can be made from 100% recycled paper. What is decisive is that paper and board for recycling are collected separately from other materials. Separate collection increases the quality of paper from recycling. Therefore, all actors involved in the process must recognise that they are handling a secondary raw material, not waste, and accept the responsibilities this implies. Unfortunately, a fibre can be recycled several times, however not indefinitely, since cellulose fibre deteriorates each time it is recycled and some products require sustained top quality of paper [40].

Part 4: Livings ecosystem management

While modern agriculture allowed for an increase in food security, it also seriously damaged biodiversity, mainly because of over-exploitation, intensive production systems, excessive use of chemicals and water, and the introduction of exotic invasive species [41]. Besides sustainable agriculture and consumption, preserving biodiversity is essential, and we need to find a way to build harmonious relationships between plants, animals and humans.

4.1 Plants

Plants are autotrophic organisms, which means that they are able to produce sugar using only water and sunlight, through photosynthesis. On the contrary, humans and animals are not able to photosynthesize, thus they need to eat other organisms (whether plants or animals) in order to survive.

In the food chain, it is estimated that the production of 1 kg of carnivorous organism requires 10 kg of herbivorous organisms, which themselves require 100 kg of vegetation (including fruit, roots, grasses and bark). Because of animals needing plants to feed them, crop

production is energetically more favourable and needs less total surface than livestock production [42].

Forests are essential for human life on earth. They host a wide diversity of plants and animals and are a natural barrier against various risks such as landslides or high thermal amplitudes. Forests represent a source for food, habitat, fuel, clothes and medication for many populations. It is estimated that 300 million people live inside or nearby forests, while 1.6 billion people directly depend on forests for their living. However, the world faces huge deforestation issues: between 1990 and 2015, 129 million hectares of forest were destroyed (almost the surface of South Africa).

The main causes of deforestation are agricultural expansion and mining activities. Primary forests are destroyed to produce Soya for livestock feeding, sugar cane for "biofuels", or palm oil for a vast variety of products we find in our supermarkets [43].

The development of genetically modified crops has amplified the debate and concerns about biodiversity, intensive agricultural practices and patenting of life forms.

Maintaining biodiversity is crucial for the equilibrium of each ecosystem. A loss of biodiversity leads to a decrease in productivity and stability. An ecosystem with a high biodiversity can overcome natural stresses such as drought or storms, and is more resistant to diseases and pests [44].

Around the world, 80 % of the GMO (genetically modified organisms) cultures are resistant to glyphosate, a total herbicide usually commercialized under the name of RoundUp [45]. The results are intensive monocultures (no biodiversity at all) with massive use of glyphosate and usually also pesticides, and losses of soil fertility. In Argentina, for example, 80 % of the farmland is covered by GMOs, mainly Soya (99 % of the Soya produced is genetically modified). Each year, 335 million tons of phytosanitary products, mainly glyphosate, are used on these cultures, causing multiple diseases and malformations [46].

For sustainable consumption, it is essential to pay attention to all the implications of the agricultural practices linked to a product, and support biodiversity and extensive agricultural practices.

4.2 Animals

The human world population is over 7 billion. At this level, even little activities at the individual scale, especially when combined, can have major effects on a global scale. Our activities not only affect plants and their environment (air, water and soil), but also the entire animal kingdom.

Because of global warming, pollution, human activities and urbanization, every year 26'000 animal and plant species go extinct. According to the Millennium Ecosystem Assessment, published by the United Nations in 2005, if the extinction rates persist at the same level, 2/3 of the animal species will be extinct by 2100.

During the 20th Century, fishing intensity increased 35-fold [46]. In 1996, a peak was reached, with 130 million tons of captured fish. Due to their destructive and overfishing methods, industrial fishing yields decrease every year [48]. More than 90 % of the fish stocks are fully exploited, and 30 % are overfished. But there are alternatives. Today, 9 % of the world's fish captures are performed in sustainable fisheries [49]. We need to encourage this and consume fishes from sustainable fisheries.

In addition to fishing and hunting, humanity has domesticated cattle for 10'000 years [50]. However, industrial livestock farming began only in the 1970's. Animals these days are treated like merchandise, fed with GMOs, treated with antibiotics and hormones to increase production, and are raised in closed buildings. This type of farming allows the production of meat, eggs and milk at low cost. In 2010, 100'000 animals were killed each minute, 80 % of them from intensive farming. The cause for this massive increase in industrial farming is the high consumption of meat. Average meat consumption in the world per inhabitant (2014) is 43 kg/year, but this number raises to almost 80 kg/year for developed countries, namely more than 200 g a day [51]. Meat consumption is tending towards a decrease in developed countries, while it is increasing in developing countries [52]. It has been proven that an overconsumption of saturated fats (mostly present in meat) is related to cardiovascular

diseases [53].

There are also terrible hidden costs of meat overconsumption and the associated industrial livestock farming. These systems cause huge environmental issues, and generate 18 % of the world's CO₂ production. Because of the presence of thousands of animals in a restrained area, urine and feces often infiltrate the groundwater, as well as drug residues. Besides the tremendous environmental degradation, industrial livestock farming causes animal welfare issues, and perpetuates famine in the world, because the huge territories for the plantations (mostly Soya) necessary to feed the animals replace other crops that could be consumed by local populations [55-56].

This is why sustainable consumption must tend towards less carnivorous eating habits, especially in developed countries.

4.3 Humans

Human beings also suffers from the new processes and practices related to massive industrialization. After World War II, the idea of commercial practices based on dialogue, transparency and respect already arose, and "fair trade" certifications appeared in the late 1980's. However, in the early 2000's the price for coffee was set by four international companies, making large profits. At these prices, little producers could not survive. However, with the rise of fair trade, producers that chose this type of production started making considerable profits compared to other non-fair producers [56]. In Switzerland in 2011, 54% of the bananas sold in retails were originating from fair trade production [57].

Fair trade usually only refers to sustainable commercial practices and social rights. Fair trade is sometimes associated with organic agricultural practices, but this is not always the case [58]. Whilst fair trade has many advantages, human and environmental health should also be taken into consideration. The use of pesticides and other phytosanitary products has been related to Parkinson's disease and various tumors in farmers. Also, it has been demonstrated that pesticides have in utero effects, and there is a link between the exposition of pregnant women and the development of various tumors, malformations and development issues in newborn children [59].

Fair trade also restrains child labour, and Fair trade certifications are sometimes more strict than the local legislation regarding child labour. It is often believed that child labour implies children under 18, but it is not the case. The ILO (International Labour Organization) defines the minimal age for normal work at 15 years for developed countries, and 14 years for developing countries. For light work, this age drops to 13 in developed countries, and 12 in developing countries. Agriculture itself is responsible for 60 % of the child labour in the world. The cocoa industry in western Africa is particularly affected by abusive child labour [60], and we should be very cautious when buying products from this area.

Nowadays, fair trade certifications are almost only related to commercial trades between northern and southern countries. However, fair trade, and especially decent working conditions, should also be considered within developed countries. For example, the terrible working conditions of seasonal workers in strawberry cultures in Huelva, Spain, have been considered as violating human rights [61]. In the United States, a recent study (2016) has revealed the “climate of fear” in which most of the 250'000 workers of the poultry production live. Working conditions are so poor, that people suffer from multiple diseases and accidents in a fearful atmosphere. More than 80 % of the workers are not allowed to have bathroom breaks and some of them are even wearing diapers during working hours [62].

In a sustainability mindset, working conditions are essential and represent an important part of the social responsibility. The international organization of standardization developed ISO 26 000, providing guidance on how organizations can operate in a socially responsible way. Not only should human rights be taken into account, but also labour practices, environment, fair operating practices, consumer issues, and community involvement and development [63].

In 2011, OECD (Organisation for Economic Co-operation and Development) published a report showing that mental troubles like depression or anxiety are rising and affect 20 % of the employees in 34 countries of the OECD zone. As a consequence, 60 % of lost workdays are related to stressful working conditions, and the cost for society represents about 3 to 4 % of the GDP for the European Union. However, only 26 % of the European companies have implemented measures to

reduce stress [64-65].

Sustainable consumption does not only concern the products, but it also concerns ethical working conditions in the complete supply chain. For each product we produce or buy, which we must apply, promote and request these practices.

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