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1. The relationship between food and culture

Culture undoubtedly is the most significant result of human activity. For a long time, it was considered an objective framework, external to the individual, within the actions and interactions of humanity are placed. Culture, however, is much more than that. **It is a transparent reality** in which we are immersed since birth, and **which we actively continue transforming** with our ideas and actions, as it is an integral part of our existence and the foundation of our conduct. Culture is both inside and outside us, and it affects the way we see the world and what happens in it. It encourages us to consider artifacts, dynamics and life events objectively, because we can perceive them in a direct and immediate way and forget that we actually observe them from specific point of view, which is our reference culture.

The regularity that characterizes and makes cultures recognizable might lead us to think that they remain unchanged over time, but regularity and variation are essential components of cultural processes. They influence each other: without regularity there is no awareness of variations and vice versa. As processes that take place over time, **cultures are in a constant state of flux** and can assume different forms at any one time, thanks to the active and passive contribution of each member of the community. For this reason, even though cultures may always seem the same, they are constantly undergoing changes and innovations that are not linear and do not have a constant and regular rhythm over time (Anolli, 2006).

Culture is a feature of all human activities and eating is no exception. In fact, food is a fitting example of culture, with its different categories and meanings, its regularity and seemingly unstoppable variations over time. National cuisines embody the thoughts and food choices of populations and their respective cultures. The history of man's relationship with food is an extraordinary social and cultural epic characterized by a constant search for meaning, which has transformed a primary and critical need of all living beings (food) into a multi-faceted reality with countless possibilities for transformation.

1.1. The cultural transformation of food

Since ancient times, as every other species on the planet, humans have interacted with nature under the overriding imperative of survival. For a very long time, this imperative was based not only on the need for humans to protect themselves against an occasionally hostile climate, but also on the requirement to prevail in the struggle to eat while avoiding the risk of being eaten. In fact, our ancestors, constantly exposed to the risk of being eaten themselves, developed increasingly complex ways of intervening on nature, well before the adoption of agriculture, about 15,000 years ago. The fundamental stages of this process are well known. Humans discovered and began to use fire as early as the Paleolithic era. At the same time, they devised a growing number of tools for hunting, fishing, defending themselves and creating shelters. Tools were initially made of stone, wood and bone long before the discovery of metals. Whether the intention is to pick fruit from a tree or kill a prey, **the relationship between humans and the surrounding environment has always been transformative.**

A crucial stage in the ability of humans to manipulate nature came with **the discovery of fire.** Used in different ways - to provide warmth, light, protection from wild animals, or send signals, dry clothes - fire led to gradual cultural developments of enormous importance, especially in the field of food. In the words of the famous 20th century anthropologist Levi Strauss, cooking food with fire is *"the invention that made humans human"*. Before they learned about cooking, humans ate food, including meat, raw, spoiled or rotten. Fire was a decisive turning point. **Cooking** and the development of language symbolically mark a transition between nature and culture, as well as between nature and society, because, while **raw food is of natural origin, cooked**



food implies a transition to culture and society, especially if we stop and think that only the diversification of cooking techniques turns nutrition into cooking (from the Latin *coquere*, “to cook”) and cooking can be transformed into gastronomy, or the art of preparing food¹.



THE DISCOVERY OF FIRE

The discoveries of fire and cooking were fundamental to overcoming the perils of the natural plant world. Native Americans, for example, discovered that ground acorns, soaked in water and then roasted, could be eaten more easily as they lost their distinctly bitter taste, and that cassava roots, which synthesize cyanide to defend themselves from predators, could be neutralized with a cooking process. But that's not all. Cooking brought great benefits to omnivorous humans. First of all, it allowed them to access many different sources of energy that were previously unavailable, making certain carbohydrates, including tubers or starchy vegetables, pleasant and nutritious. Genetic, archaeological and anatomical data show that our cave-dwelling ancestors loved tubers and cereals (the true paleo-diet was actually rich in carbohydrates) and their consumption, especially in the form of starches, was fundamental for the rapid increase in the size of the human brain over the past million years (Hardy et al., 2015).

¹ People often think that only the richest and most complex cuisines achieve gastronomic standards high enough to boast such a title, but it is good to remember that even the simplest and poorest cuisines, within the limits allowed by the ingredients and technological options available, can transform foods into art. (Niola, 2009).



THE LAST HUNTER-GATHERERS

A boy from the Hadza hunter-gatherer people, for whom honey is an essential source of energy (photo by Matthieu Paley)

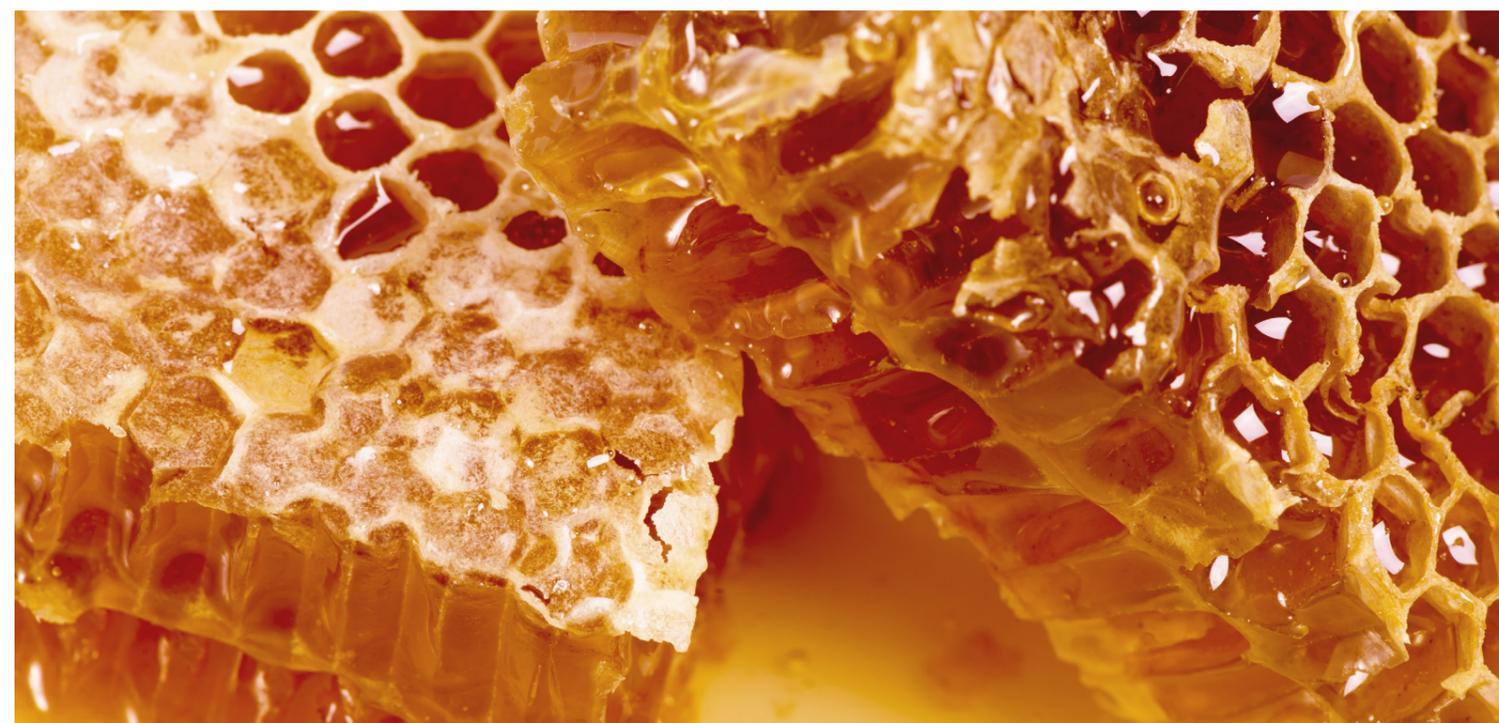
Although physically poorly equipped, compared to other animals, the hunter-gatherers of the ancient world were gifted with remarkable mental skills and a great exploratory curiosity. Their diet consisted mainly of plant-based food or - in areas close to seas and rivers - fish and mollusks. Some populations were almost exclusively vegetarians. In other hunter-gatherer populations, the diet was to a much larger extent based on game, and therefore on the consumption of meat, especially in areas where adverse climatic conditions limited food choice (and where it is still limited, such as in the arctic and subarctic regions, where there is little else for hunter-gatherers to eat).

Still today, we can see how some hunter-gatherer people feed themselves.

In Tanzania, the Hadza people live around the Lake Eyasi area. This is a very particular ethnic group which comprises people who still live as authentic “hunter-gatherers”, without practicing any type of animal breeding during the year, nor making any attempt to cultivate any food. It is one of the last communities to live this way. Men go out hunting every day, bearing different types of arrows with them, including poisoned ones for bigger animals and thinner ones for birds. Women, on the other hand, take care of the gathering, especially tubers. They especially love honey, which they obtain by driving the bees away with fire. Honey is eaten as-is, with the whole honeycomb - including the larvae that still occupy the cells - and is highly appreciated for the excellent flavor to energy ratio.

The honey is usually eaten on site but is also transported and brought to women, children and the elderly.

The way these people live is very interesting today for many reasons, including the fact that they have virtually no impact on the environment, consuming only what they strictly need and nothing else. Furthermore, despite the fact that life expectancy at birth is considerably lower than average (especially due to the lack of adequate medical facilities and a life exposed to all kinds of dangers), these people have remarkably healthy hearts and metabolisms, a sign of the fact that traditional lifestyles, diet, physical activity, combined with a harmonious life within their own cultural context, promote a degree of mental and physical protection and well-being (Marlowe , et al., 2014; Pontzer et al., 2017; Sorokowska et al., 2017).





2.

The omnivore's dilemma and the cultural classification food

What are the criteria that guide our food choices? Today, in the era of globalization, where food abounds, one might think that personal taste is the main one. In actual fact, **our choices depend on a combination of multiple factors** ranging from physiological to psychological, social, economic and cultural ones. The wide range of options to choose from is determined by the very nature of **human beings**, who, unlike other animals, **are omnivores**, meaning that they can eat food of both animal and plant origin.

For humans, being omnivorous has been both an advantage and a challenge throughout their evolution. The diet of carnivores and herbivores is dictated by mechanisms inherent in their genes, which means that their digestive system is able to obtain everything their body needs from specific foods. Omnivores, however, and especially humans, have to spend a lot of time trying to figure out which of the countless foods offered by nature can be eaten without running health risks. The flexibility afforded by the absence of food specialization has allowed humans to colonize all of the earth's habitats, including the most extreme, adapting to the different types of available food. This flexibility has however posed constant challenges to humanity in recognizing the most suitable foods. This inherent difficulty of choice has been called the **omnivore's dilemma** (Rozin & Fallon, 1987).

Even now, when humans come across something new, or potentially edible, they face two conflicting feelings: neophobia, i.e. the fear of eating an unknown substance, and neophilia, i.e. the desire to open up to new flavors. Humans are endowed with extraordinary recognition and memory skills that allow them to avoid poison and search for the most nutritious foods. In this adaptive process, our sense of taste has played a fundamental role, genetically leading us to prefer sweetness, a sign of energy richness, and instinctively avoid bitterness, a natural characteristic of many harmful substances, from spoiled meat to poisonous berries.

In addition, to relying on their senses and memory, when choosing food, individuals also rely (but not only) on their culture and traditions that preserve the knowledge and accumulated experience of countless “tasters” before them. Their influence is so marked that in societies where there are high levels of food security, eating has become above all a mental activity, because our eating habits are strongly influenced by mental representations of what we and our culture deem edible. This means that we eat with our eyes first and then deploy our sense of smell (in fact when we have a cold, we no longer taste flavors), taste, touch (to evaluate consistency and temperature) and finally hearing, as we often judge foods, especially crunchy ones, based on the sound they make when chewed.

Historically, culture has codified nutrition rules with a complex set of prohibitions, rituals, recipes, rules and traditions. All this has allowed human beings, for many centuries, to avoid facing the omnivore’s dilemma every time. The range of potentially edible foods is obviously much wider than what we normally consume, because various human societies tend to restrict the notion of what constitutes food, sometimes by quite a lot. English-speaking countries, for example, are well-known for eating large amounts of meat, but horse meat is never on the menu. Horses, like rabbits, are not just any animals, they are pets, so it would be abominable to serve them on a plate. The English saying: “I’m so hungry I could eat a horse!” is not just saying you are very hungry, but that you are hungry enough to cross the boundary of what is normal or legitimate to put on your plate. In Italy, however, horse butchers are widespread, particularly because the horse, as a symbol of vigor, was traditionally recommended to the weaker, such as anemics and children, for reasons that combine nutritional aspects with symbolism. Rabbit meat is also very popular and is cooked in many different ways in all regions.

Every culture tends to divide what can and can’t be eaten based on many elements of a symbolic and social nature. Some of the symbols and meanings that are most commonly associated with food and its classification process will be briefly explored in the next paragraph.



WHO'S AFRAID OF NEW FOOD?

Food neophobia is the reluctance to taste unfamiliar foods. Although it is an innate and universal predisposition that peaks between the ages of two and five years, there is still room for considerable inter-situational and inter-individual variability, as the same person can have different reactions to the same food depending on the situation they are in and their previous experiences and temperament.

Over the centuries, food neophobia has had an important protective function but in modern and post-industrial societies, where food safety levels are high, this predisposition can have negative effects on the quality and variety of the diet, for both adults and children, above all by reducing the consumption of fruit and vegetables, but also by increasing the reluctance to accept new products, such as vegetable substitutes for meat (Cavazza & Guidetti, 2020).

2.1 Some cultural meanings of food

Taste, observation, memory and the dissemination of food knowledge have allowed, and still allow, individuals to create bonds with their peers, not only in small groups, but within the community. Food preferences and symbols are important instruments of cohesion and, over the course of history and cultural development, an incalculable number of them have developed. The following paragraphs describe some of the most common categories (Niola, 2009).

Sharing, ceremonies and rituals

By its nature, **food contains a symbolic, identity-building and relational significance that transcends its nutritional value** and the physical need to eat. Our food choices communicate something about us and we form our impressions of others based on what they eat. Associating characteristics with food is an ancient practice and, in some tribes, certain animals are still eaten (or not eaten) to acquire their physical and moral characteristics. In some cultures, for example, warriors do not eat some kinds of meat, such as rabbit meat, in order not to lose courage.

Food and its sharing have multiple meanings for individual, groups, and society. Not surprisingly, for many people, dinner is a predominantly relational experience during which a process of building and sharing intimacy and closeness is initiated, and an affective and emotional involvement is felt. What we eat, and how we eat it, are seen as a set of products and conventions with a precise identity-building significance.

Food is enshrined in many cultural events in human life, including **rituals, ceremonies and religious celebrations**, all over the world. For example, in Judaism a considerable number of mitzvot (precepts), which guide the life of an observant Jew, concern food and originate from important passages of the Old Testament. One example is the bitter herbs, accompanied by unleavened bread, which are eaten with lamb during Passover. These recall the bitterness of slavery and the bread must be unleavened to remember the haste during the escape from slavery. Food does not only accompany celebrations, however, but is also present in the sharing of pain. In antiquity it was customary to leave food supplies in the tomb to support the deceased



on their journey to the afterlife², but funeral meals are also still practiced in many religions, all over the world. Food is also prepared to commemorate and remember the dead. For example, Orthodox Christians still prepare *coliva* (sometimes written and pronounced differently depending on linguistic and geographical derivations), a dessert made with boiled wheat grains sweetened with honey and mixed with other ingredients, depending on the variation. However, the basic elements, namely wheat and honey, are chosen for their symbolic value linked to the end of life and resurrection (wheat from the earth and honey to symbolize the sweetness of afterlife).

In this sense, sharing food can be an important way to access a community, because it helps making people an integral part of the same culture and putting them in communication with one another. **The gift of food builds a bridge between people**, and in all societies, it has always played a significant part in social dynamics.

Power and prestige

Access to food has a precise relationship with **power**. Rank establishes the rules of access to food even among many other animal species. For example, despite being the protagonists of the hunt, lionesses will not touch their prey before the lion has finished eating. Among humans, control over food has historically been a major source of power. In the Middle Ages, for example, noble family banquets contrasted with widespread endemic hunger among the peasant masses, and in various parts of Europe people caught poaching in the hunting reserves of royal families or local lords were put to death. This power imbalance has survived to the present day as there is still a lot of competition in the agriculture and livestock sector, not only to obtain more land and water resources, but also to have exclusive use of food production and of storage tools and techniques.

Food can also be an expression of power in society, especially in terms of **prestige**. In all eras, including our own, some foods act as status indicators, symbols of value and exclusivity, principally because of their price or lack of availability. Truffles and caviar are examples of these, while in the past it was spices in European cuisine, or chocolate, that were the foods exclusively reserved for the wealthiest in society. Finally, we must not forget **that taste does not,**

² For example, food and drink, along with everyday objects, have been found among the funerary objects of the ancient Egyptians, because they believed that the soul still needed to eat and drink and required all the things that were necessary during life. Thanks to this important ritual, the eating habits of those people have survived to this day.

in principle, have precise social boundaries. For example, in nineteenth century Naples, shellfish were fished in abundance from the cliffs and were all grouped under the name of “*ranci d’arena*”. Once cooked and seasoned with bell peppers, they were eaten by the poorest people. Today, however, the price of shellfish can make them unaffordable. The same can be said of chestnuts, formerly regarded as the bread of poor mountain people, for whom it was a staple food, and now a seasonal ingredient much sought after in gastronomy.



Orders, combinations and prohibitions

Every culture has established conventions that determine the **rules for the structure of a meal, food associations and compatibility**, based on dietary, ideological or religious criteria. In the Far East, for example, meals have a horizontal and collective structure. There are no appetizers, first courses or second courses, side dishes and desserts, like there are in Italy, but courses follow one another and are shared at the table according to the harmony of flavors, colors and shapes, alternating salty with sweet, bitter, sour and spicy. Similarly, in every culture, dishes and foods more suitable for different moments of the day (i.e., breakfast, lunch and dinner) have been codified. In the Far East, for example, rice is a key food in traditional breakfasts (e.g. in Japan, South Korea or Malaysia) which tend to be savory, while in modern central southern Europe, baked goods are widespread, eaten with hot drinks and coffee (e.g. the French *viennoiseries*, pastries including butter croissants, *pain au chocolat*, brioches or *pain au raisins*, accompanied by freshly squeezed fruit juice and/or a hot drink, such as tea or coffee).

Within these conventions, certain food-related **prohibitions** stand out, especially in the religious sphere. In Judaism, for instance, the rules set out in the Torah allow the consumption of animals with a split hoof that are also ruminants (such cows and goats, but not horses, camels and pigs), which must be strictly slaughtered according to the ritual. Furthermore, meat and milk cannot be consumed at the same meal (therefore, for example, meat cannot be cooked with butter). Even in the Muslim religion, eating pork (and wild boar meat) is forbidden and animals must be slaughtered following a specific procedure, while Hinduism forbids the consumption of beef. The origin of these choices has long been questioned and various historical/anthropological explanations hypothesize that they are dictated by hygiene, but also by environmental cost/benefit analyses. As an example, take the sacredness of the zebu for Hindus. From a historical perspective, keeping the animal alive offered many advantages, while the benefits brought by the meat were limited in time, as it was not possible to keep it for very long. Furthermore, it prevented a few wealthy people from managing the entire meat market, thus dominating the only source of subsistence for the people. Conversely, in the Middle East, pigs did not offer particular advantages other than the production of meat which, however, could not be preserved. The animal was not resistant to heat, could not follow nomadic populations, was not useful in the fields and was expensive to raise as an omnivore (it cannot eat grass like goats) and therefore competed directly with humans, with nutritional needs that were vastly greater given its size. Raising pigs in that context was therefore very expensive (Harris, 1985).





ABUNDANCE VERSUS WASTE

In ancient times, rich European aristocratic courts customarily flaunted their luxury and wealth even through food, offering diners more than they could consume. However, the abundance was unlikely to be wasted, as leftovers were either eaten or disposed of by servants through trading circuits (Montanari, 2016).

The situation is very different nowadays. Globally, one third of the food produced is lost or wasted along the food chain, causing serious economic, environmental and social costs. In 2014, the United Nations Food and Agriculture Organization (FAO) calculated that the total cost of global food loss and waste amounted to approximately US\$ 2.6 trillion, including US\$ 1 trillion in economic costs, US\$ 700 billion in environmental costs and US\$ 900 billion in social costs.

Awareness of these figures has recently awakened global consciences and many Countries have already developed important strategies to achieve goal 12.3 of the United Nations 2030 Agenda³. At European level, for example, there are numerous examples of good practices in the fight against food loss and waste, ranging from private companies to local authorities, research institutes to app developers and private citizens who are increasingly equipping themselves and taking action to contain waste, a sign that waste has taken on a new cultural meaning.

³ Goal 12.3. "By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses".



One example is the “doggy bag”, which arrived in Europe from the United States and was initially greeted coldly and unenthusiastically, because customers were ashamed to ask for it, especially for cultural reasons. While it may not yet be common practice everywhere (for example, it is widely used in the countries of Northern Europe), more and more best practices are encouraging this service and people are asking for it in restaurants and schools. In Italy, effective steps have been taken with the launch of the Gadda law, which encourages the use of doggy bags in catering establishments (although a lot of communication regarding this incentive remains to be done) and, in Milan, primary school children received snack-saving bags to take leftover non-perishable products after lunch.





2.2. Traditions and innovations

The first chapter explained how cultures are constantly changing although they may always seem the same in people's eyes. Constant interactions between individuals generate incessant forms of development and innovation, while creolization gives rise to new identities and cultures. One clear example is the contamination between different cultures that took place during the European Middle Ages. During this period, Roman and barbarian cultures merged and brought together the consumption of bread, wine and oil with meat and animal fat. Bread and pork became the distinctive signs of European identity. Other examples of contaminations that later became "symbolic" dishes are: pasta al *pomodoro* (pasta with tomato sauce) in Italy or *Tempura* (天ぷら) in Japan. The former would not exist if, in the sixteenth century, the conquistadors had not returned from their expeditions with the *tomatl*, an Aztec term that identified wild tomatoes, which are native to the Andes. Initially regarded with distrust in Europe, several centuries passed before the historic encounter between *pummarola* and macaroni in Neapolitan recipe books, which only took place in the nineteenth century. Tempura is also the result of a creolization process. The custom of frying vegetables in batter was introduced in Japan in the seventeenth century by Portuguese missionaries, to make the abstinence from meat less burdensome. Christians in fact had to abstain from meat during the four ember days or *tempora*, from which the name of the national dish then derived.

The birth of the food industry, technological developments and the rise of globalization have introduced significant innovations to the way we consume and approach food, especially in the wealthiest Countries, but not only. Our current traditions stem from very recent history, which is characterized by the abundance and spread of high energy food, rich in fat, sugar and salt, which were only eaten occasionally. The perpetuation of unbalanced food choices, associated with unsustainable lifestyles, has had important repercussions on our health and that of our planet and in the next chapter the key elements of this process and its possible solutions will be briefly explained.



3.

The importance of the food culture of sustainability

Food culture has changed radically since the end of World War II, which marked the birth of the modern food industry. An extraordinary cycle of technological innovations was introduced at that time which led to very fast economic and social progress. Although humanity is still a long way from achieving UN Goal 2, Zero Hunger, unprecedented levels of food security have been achieved and, for the first time in history, the number of obese or overweight people has surpassed that of those affected by hunger. At the same time, however, the emergence of new food cultures and the gradual abandonment of traditional foods and lifestyles is endangering our health and that of our planet. More and more people are falling ill due to poor diets and lifestyles⁴ and food systems are responsible for greenhouse gas emissions (21 to 37% of total net human emissions), 70% of freshwater withdrawals, soil degradation, nutrient depletion, deforestation and loss of natural ecosystems and biodiversity (IPCC, 2019). The impact of COVID-19 has added many critical issues to this situation, posing multiple and imminent challenges for public health, food systems and employment.

Food consumption patterns are an important lever for reversing these trends, improving health, well-being and longevity, and reducing disability and premature deaths, while remaining within the planetary limits in which we can operate safely. Furthermore, sustainable food can accelerate poverty reduction and social inclusion, increase fairness and justice, guarantee education and health care for all, promote the protection of biodiversity, water security and mitigation and

⁴ Food choices are the greatest risk factor for health and well-being, causing 9.1 million premature deaths from cardiovascular disease worldwide each year, 50% of all cardiovascular deaths (Riccardi, Vitale & Vaccaro, 2020).

adaptation to climate change. In other words, healthy and sustainable food and food systems can positively affect the achievement of all goals included in the 2030 Agenda for Sustainable Development, adopted by all member states of the United Nations in 2015 and in the 17 Sustainable Development Goals. (SDGs).

According to the Food and Agriculture Organization of the United Nations (FAO),



"sustainable diets are diets with low environmental impacts that contribute to food and nutrition security and to healthy life for existing and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources".

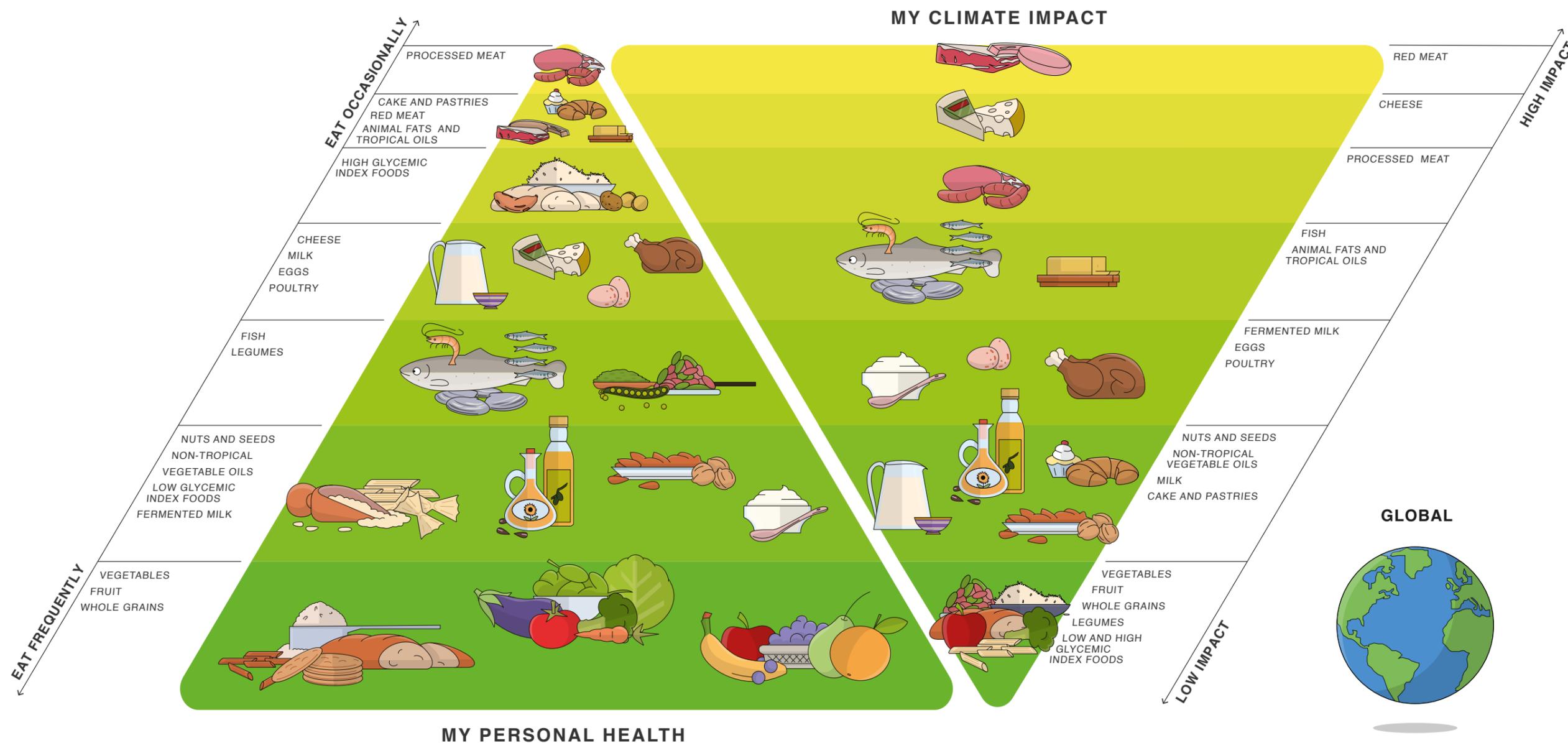
The sustainability of diets is therefore a very broad concept, which integrates the dietary lifestyle recommended for health with environmentally friendly agricultural production, maintaining the health and well-being of present and future generations as a general objective. In particular, sustainable diets are characterized by great flexibility and are made to integrate novelty with tradition, without necessarily depending on new technologies and without excluding any particular food, thus meeting the needs of individuals. If consumed with the right frequency and in portions of adequate size, in fact, **all foods can be part of a healthy and sustainable diet.**

For example, the **global Health and Climate Double Pyramid** shows the relationship between the impact of food on people's health, well-being and longevity and the pressure of the food system on the environment, and more precisely on the climate. No food is excluded but it is advisable to keep an eye on the frequency of consumption and recommended portions. The Health Pyramid in fact includes foods that should be eaten more often (e.g., fruit, vegetables and whole grains). Pulses and fish are the preferred protein sources, while red meat and high glycemic index foods should be eaten in moderation. The Climate Pyramid, on the other hand, shows that products of animal origin are the ones that contribute most to climate change, while plant-based products are those that contribute the least. Consequently, the Double Pyramid

supports the message that through a varied and balanced diet we can improve our health, our longevity and our well-being, while reducing our carbon footprint, without giving up the foods we like. In fact, the foods that should be consumed more often for our health also have a low climate impact.



Double Pyramid - Global



DAILY CONSUMPTION: **WATER:** AT LEAST 2 LITERS | **COFFEE OR TEA:** MAX 3 CUPS | **WINE:** MAX 1-2 GLASSES | **BEER:** MAX 1 CAN | **SALT:** MAX 1 TEASPOON
SOFT DRINKS: OCCASIONALLY
 BE PHYSICALLY **ACTIVE** AND PRACTICE EVERYDAY **MINDFULNESS**

Healthy and sustainable diets are already part of the food heritage of all culture⁵.

Their key message is eloquent: foods that should be consumed most often for our health are generally also those with a low climate impact. In fact, they involve eating a large percentage of foods of plant origin, such as fruit, vegetables and whole grains, and include a series of protein sources: mainly pulses and nuts, but also dairy products, fish, poultry and eggs. Among animal sources, fish and poultry should be eaten more often (and have less impact on the climate) than red meat.

In general, sustainable diets include the Mediterranean diet and Mexican cuisine, both of which have been awarded UNESCO intangible heritage status, but also many Asian and African diets, as well as those of the Nordic countries, because health and sustainability are two objectives that can be reconciled at any latitude. Studying, archiving, protecting and enhancing the food heritage of the various culinary regions of the world is therefore necessary and fundamental in order to respond to the new demands of the present and spread a new culture of sustainability that starts from food.

⁵ For more information we recommend the following reading: **“Diets that respect the health of people and the Planet”**, an in-depth educational reference about the Double Health and Climate Pyramid, enhanced by the seven Cultural Double Pyramids of seven food models from as many regions of the world. The foods of the different culinary traditions are divided according to their impact on cardiovascular diseases and CO₂ emissions to demonstrate how a healthy and sustainable diet is possible at every latitude.



The impact of COVID-19 on agri-food systems



3.1. An example of a sustainable diet: the Mediterranean model

The Mediterranean diet can be defined as the nutritional model inspired by the traditional eating habits of the Countries of the Mediterranean basin, including Italy, Greece, southern France, Spain, Portugal and Morocco. These countries have different regional traditions but share agricultural and rural models, as well as the recurring ingredients that make up the Mediterranean diet: cereals, fruit, vegetables, pulses, nuts and seeds and olive oil, combined with a moderate consumption of fish, poultry, eggs and dairy products and sporadic use of red meat and animal fats. Furthermore, these Countries make ample use of herbs and spices that help keep salt intake low and consume moderate amounts of wine and other fermented beverages during meals.

Many scientific studies have indicated the Mediterranean diet as a valuable ally to ensure physical well-being and the prevention of chronic diseases, while protecting the environment and biodiversity. Its nutritional characteristics were highlighted in the 1950s, particularly thanks to the now famous “Seven Countries Study” by the American physiologist Ancel Keys, who compared the diets of different people to verify their benefits and disadvantages: 12,000 people analyzed in a longitudinal study that lasted 35 years, which proved the strong correlation between nutrition and health. The seven Countries involved were Italy, the USA, Finland, Yugoslavia, Japan, Holland and Greece. As for Italy, it clearly emerged that the population analyzed had a very low blood cholesterol rate and, consequently, a minimal percentage of coronary heart disease. This was mainly due to their diet, based on the abundant use of extra virgin olive oil, vegetables and fruit, dried fruit, cereals and derivatives, such as bread and pasta, aromatic herbs, pulses, locally caught fish, and moderate consumption of poultry, meat and dairy products. On the contrary, the people of the United States, Finland and Holland had a very high blood cholesterol rate, and a high mortality from cardiovascular diseases. This was attributable to the type of diet of these populations, which is rich in butter, cheese and meat. This study created a new field of research and, since then, increasing evidence has shown **the protective effects of the Mediterranean diet** against type 2 diabetes, metabolic syndrome, cardiovascular disease and certain types of cancer (Serra-Majem, L. et al., 2006; Sofi, F. et al., 2008; Estruch, R. et al., 2018; Kargin, D., 2019; Serra-Majem, L. et al., 2019).

It is good to remember, however, that as well as being a selection of food, the Mediterranean diet is a way of thinking about food. For this reason, during the registration process as an intangible cultural heritage, it was reported that:



“The Mediterranean Diet [...] promotes social interaction, since communal meals are the cornerstone of social customs and festive events. It has given rise to a considerable body of knowledge, songs, maxims, tales and legends. The system is rooted in respect for the territory and biodiversity and ensures the conservation and development of traditional activities and crafts linked to fishing and farming in the Mediterranean communities”.

The pace of life Italians has quickened considerably since the days of Ancel Keys, and their diet has gradually followed this trend. The result is that the time and quality of the space dedicated to food throughout the day are significantly compressed, with more meals consumed outside the home, and more processed foods found on household tables. However, the fact that the Mediterranean diet is not always practiced does not mean that, culturally, it is not well rooted and cannot represent a precious heritage to be valued for the sustainable growth of individual and social well-being. The challenge is therefore to reconcile the Mediterranean diet with contemporary lifestyles through actions that allow their values to be preserved in the future socio-economic context, generating collective well-being for people and the Planet. This is particularly important especially for new generations, among whom data show a gradual but steady abandonment of the Mediterranean diet in favor of new food trends, characterized by more foods with a high fat content, with serious potential repercussions on health. All EU Countries have high levels of overweight and obesity (both among adults and children), as well as insufficient levels of physical activity, but southern European Countries, historical centers of the Mediterranean diet, together with the United Kingdom, now have the greatest prevalence of overweight in children and adolescents (BCFN, 2021).



THE VALUE OF MEDITERRANEITÀ

The word *mediterraneità* is a newly coined word formed of two fundamental elements. On one hand, the term is rooted in the characteristics (traditional and contemporary) of the food of the Countries bordering the Mediterranean basin: i.e. the set of foods that characterize the Mediterranean diet. On the other hand, the term summarizes and expresses the dialectical relationship between the peoples of the Mediterranean, the food they eat and how they eat: the set of habits, rituals, behavior patterns - individual and collective - associated with the preparation and consumption of food. This cultural dimension, which is associated with the consumption of those foods, dictating food choices and the methods by which they are prepared and eaten, constitutes the unifying element and the point of convergence of a very rich and diversified heritage of recipes and gastronomic traditions in the various Countries of the Mediterranean.





FLEXIBILITY AND VARIETY

Pulses are recommended sources of protein. Their production has a low impact on the environment and their cultivation helps to fix atmospheric nitrogen in the soil, improving its fertility and reducing dependence on artificial or energy-intensive fertilizers. Furthermore, the consumption of legumes is associated with a reduced risk of developing cardiovascular disease, which means that they should be eaten regularly during the week (three/four times by adults).

Pulses originate from the Nile valley, the Far East and later the Americas. Beans are very common and exist in many different varieties: cannellini, borlotti, runner, adzuki, black eyed and kidney. Chickpeas are an example of how a single ingredient can be combined in many different dishes and serve the needs of many different cultures: Moroccan *tajine*, the name of which derives from the characteristic dish in which it is cooked; *humus* (creamed chickpeas) with *tahini* (sesame seed paste), lemon and garlic or Middle Eastern *falafels* (chickpea balls); Italian *farinata* or French *socca* (a type of focaccia made only with chickpea flour).

4.

Conclusions

The consumption of food is, by its nature, a specific human cultural experience. In fact, the link between food practices and culture is structural and runs through the entire history of humanity. The problems highlighted by today's food systems, with their impacts on the health of people and the planet, require the spread of a food culture that is more attentive to the values of sustainability in all its forms.

Culture has always been a results multiplier, thanks to its ability to activate and direct people's energies in a collective way. Limiting ourselves to identifying technical solutions to emerging problems and neglecting the dissemination of a cultural and knowledge dimension, means planning short-term interventions and neglecting the need to tackle the root causes of current difficulties. In this sense, in practice, strengthening the health-environment-culture link means:

- **ENHANCING THE RICH AND COMPLEX RESERVOIR** of conviviality that is promoted and facilitated by food;
- **PROTECTING KEY LOCAL VARIETIES** and expanding their use. As an expression of the identity of a community and a territory, food retains a uniqueness that provides an opportunity to rediscover one's cultural roots while forming a relationship with other traditions. For this to happen, however, the richness of identities must be preserved while remaining open to contamination, reinforcing the emotional capital linked to roots, typicality and location, but accepting their universal human aspects;
- **TRANSFERRING KNOWLEDGE AND KNOW-HOW** as extraordinary reserves of cultural richness. Food preparation is by its nature a largely artisanal experience: the consumer's job is to contribute to it by participating in forms of co-production with those who make food products available. This requires important skills, which must be preserved and transferred over time;

- **ENCOURAGING THE CONSUMPTION OF FRUIT AND VEGETABLES AND PROMOTING AN ACTIVE LIFESTYLE FROM AN EARLY AGE.** Children will not necessarily adopt different eating and lifestyles once they become adults. In fact, in most cases, their habits become persistent and difficult to eradicate;
- **AIMING FOR EXCELLENCE IN THE INGREDIENTS,** establishing a direct and respectful link with the context in which the raw material is born;
- **RESTORING THE VALUE OF FOOD** as a means of developing a fertile relationship between generations, promoting the simplicity and clarity of its benefits;
- **RESTORING ANCIENT FLAVORS** that can be renewed to suit contemporary tastes through a critical operation that retains the best gastronomic tradition while striving to reinterpret them creatively;
- **SPREADING A CULTURE OF GOOD TASTE AND HEALTHY LIVING THROUGH THE CONSUMPTION OF HEALTHY AND SUSTAINABLE FOOD,** because revitalizing the magic and wonder of food, with its rituals and carefree pleasure - as an existential and cultural fuel - renews the centrality of people and their emotions, whose drive is geared towards change.

Glossary

Biodiversity: this term refers to the extraordinary variety of plants and animals that live in nature and interact with one another in their natural habitats and ecosystems. Biodiversity is not a fixed value, because within the environment the quantity of plant or animal species can increase or decrease over time due to various factors that can be natural and/or the result of human activity.

Carbohydrates: also called glucides (from the Greek, *glucùs*, meaning “sweet”) are organic chemical compounds consisting of carbon, hydrogen and oxygen atoms. Carbohydrates, both simple and complex, form the basis of a balanced diet and are the main source of energy for the body, above all for the brain and red blood cells, which rely on glucose alone to “fuel” cell activities. Their consumption, in adults, varies depending on individual requirements, however they should account for approximately 45-60% of the daily calorie intake. According to the guidelines (CREA, 2019), this energy portion of the diet should come mainly from complex carbohydrates (in the form of starches) and, to a lesser extent, from simple sugars.

CO₂: carbon dioxide. An acid oxide with a molecule made up of one carbon atom (symbol: C) bonded to two oxygen (O) atoms. This chemical compound is essential for life on Earth but the quantities produced by human activities increase the greenhouse effect which, in turn, contributes to global warming.

Creolization: from a social point of view, this term refers to the contamination and hybridization of different cultural forms that come from various populations. For example, the vast geo-cultural movements that have crossed the Mediterranean basin led to the birth and evolution of what is now called the Mediterranean diet. It is not a stand-alone event but the result of a long series of internal and external changes.

Diet: from the Greek, *diaita*, diet originally meant habit, way of living and gave rise to the Latin *diaeta*. The term diet indicates a set of eating habits/practices. Nowadays, however, the term is increasingly associated with a period of more or less intense food restriction, distorting the ultimate meaning of the word, which emphasizes the importance of constancy and habit.

Greenhouse gases: these are gases present in the atmosphere that tend to block the emission of heat from the earth's surface, from the atmosphere and clouds, thus hindering its escape into space. They work like the glass in a greenhouse, hence their name. These gases can be either natural or the result of human activity.

Fats: or lipids, are the nutrients highest in calories and, in an adult's diet, they should contribute to 20-35% of total energy, depending on individual energy expenditure. Not all fats are the same and they can be divided into saturated, polyunsaturated, monounsaturated, trans and hydrogenated fats. Cholesterol is also a type of fat and, together with saturated and trans fats, it affects the level of cholesterol in the blood. Nevertheless, unlike other fats, it is not an essential nutrient, since the body is capable of producing it in sufficient quantities to meet its needs (for hormone synthesis and bile production).

Malnutrition: the term refers to a condition characterized by deficiencies and imbalances, due either to excess or insufficiency of the amount of energy/nutrients that an individual needs to consume on a regular basis. In general, it is a very broad term which covers two macro-conditions: under-nutrition and over-nutrition.

Proteins: these can be defined as the body's “building blocks” and are comprised of a chain of 20 different, simpler elements called amino acids. Of these 20, 8 are classed as “essential” inasmuch as they need to be introduced through food, since our body is unable to “build them”. Protein provides 10-15% of an individual's daily calorie intake and, in adults, should amount to 0.9 grams per kg of body weight per day, the equivalent of around 50-70 grams for a person of healthy weight with a moderate level of physical activity.

SDGs: The Sustainable Development Goals set by the United Nations are a set of 17 goals established for the future of international development which together form an extensive plan of action and include 169 targets. The Development Goals were signed in 2015 by the 193 member Countries of the United Nations for the 2015-2030 time frame. Unlike the MDGs, the SDGs are designed for all Countries of the world, reminding us that sustainable development is an universal objective.

Food security: this term refers to the availability of sufficient food to meet people's basic dietary needs or, in other words, a situation in which everyone has equal and stable access to a sufficient quantity of affordable food.

Metabolic syndrome: a physiological condition characterized by the coexistence of a set of factors that predispose an individual to a greater risk of developing cerebro-cardiovascular diseases and type 2 diabetes mellitus.

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Afterword

BARILLA CENTER FOR FOOD & NUTRITION FOUNDATION

The Barilla Center for Food & Nutrition Foundation (BCFN) is a think tank and research center which analyzes the complexity of current agri-food systems and, through a variety of initiatives, fosters change towards healthier and more sustainable lifestyles in order to achieve the Goals set by the United Nations 2030 Agenda for Sustainable Development (SDGs). With its scientific research and public initiatives, the Barilla Foundation promotes an open dialogue between science and society both nationally and internationally. It addresses today's major food-related issues with a multidisciplinary approach and from the environmental, economic and social perspective, to secure the wellbeing and health of people and the planet.

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