



Diets that respect the health of people and the Planet



**Fondazione
Barilla**

il tuo cibo, la tua terra



Index

4	1. Introduction
14	2. Africa
20	3. South Asia
26	4. East Asia
32	5. Latin America
40	6. Mediterranean Countries
46	7. Nordic Countries and Canada
52	8. United States of America

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1.

Introduction

Diets that respect the health of people and the Planet

At a time when climate change constitutes one of the greatest environmental challenges faced by humanity, the agri-food issue cannot be limited to just the nutritional aspect but must necessarily consider the effects that food and food systems have on our planet, from production to consumption.



The importance of nutrition for health is well known. Eating habits and lifestyles can have a significant effect on people's well-being and quality of life, and this is true from a very young age. However, the link between food and the environment is equally important. The reason for rising temperatures, melting glaciers and increasingly extreme weather events is believed to be the continuous emission of greenhouse gases¹ generated by human activities, including the production of food. The way we eat today is in fact responsible for 21 to 37% of the greenhouse gas emissions, more than the heating of buildings (23.6%) and transport (18.5%)² (IPCC, 2019).

Is there a way to safeguard our health without compromising that of the planet?

Luckily, the answer is yes. And there is more than one way to do it. Healthy and sustainable diets contribute to improving well-being and longevity, reducing disabilities and premature deaths (by about 20%), without compromising the opportunities offered by the Planet, in terms of resources and regenerative capacity. Recent studies in fact show that these diets contribute to protecting wildlife, reducing their loss by up to 46%, while decreasing food-related greenhouse gas emissions by at least 30% and agricultural land use by at least 41%³.

¹ Greenhouse gases, including CO₂, 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.

² IPCC (2019). IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems.

https://www.ipcc.ch/site/assets/uploads/2019/08/4.-SPM_Approved_Microsite_FINAL.pdf

³ WWF. Planet-Based Diets | WWF. Planet-Based Diets - Sci.-Based Platf. Encourage Diets Are Good People Planet at <https://planetbaseddiets.panda.org/>



What are healthy and sustainable diets?

These are diets for healthy adults which, regardless of the relevant culture, include a large number of plant-based foods, such as fruit, vegetables and whole grains. They include a variety of protein sources, originating mainly from nuts and legumes, but also from dairy products, fish, poultry, and eggs, and involve a moderate and modest consumption of red meat and high-glycemic foods, such as potatoes, rice or white bread. These basic elements can be supplemented by other measures such as preferring fresh, seasonal and local food, avoiding overeating, reducing, reusing and recycling food packaging.

But how can the link between food, health and the environment be explained in simple terms?

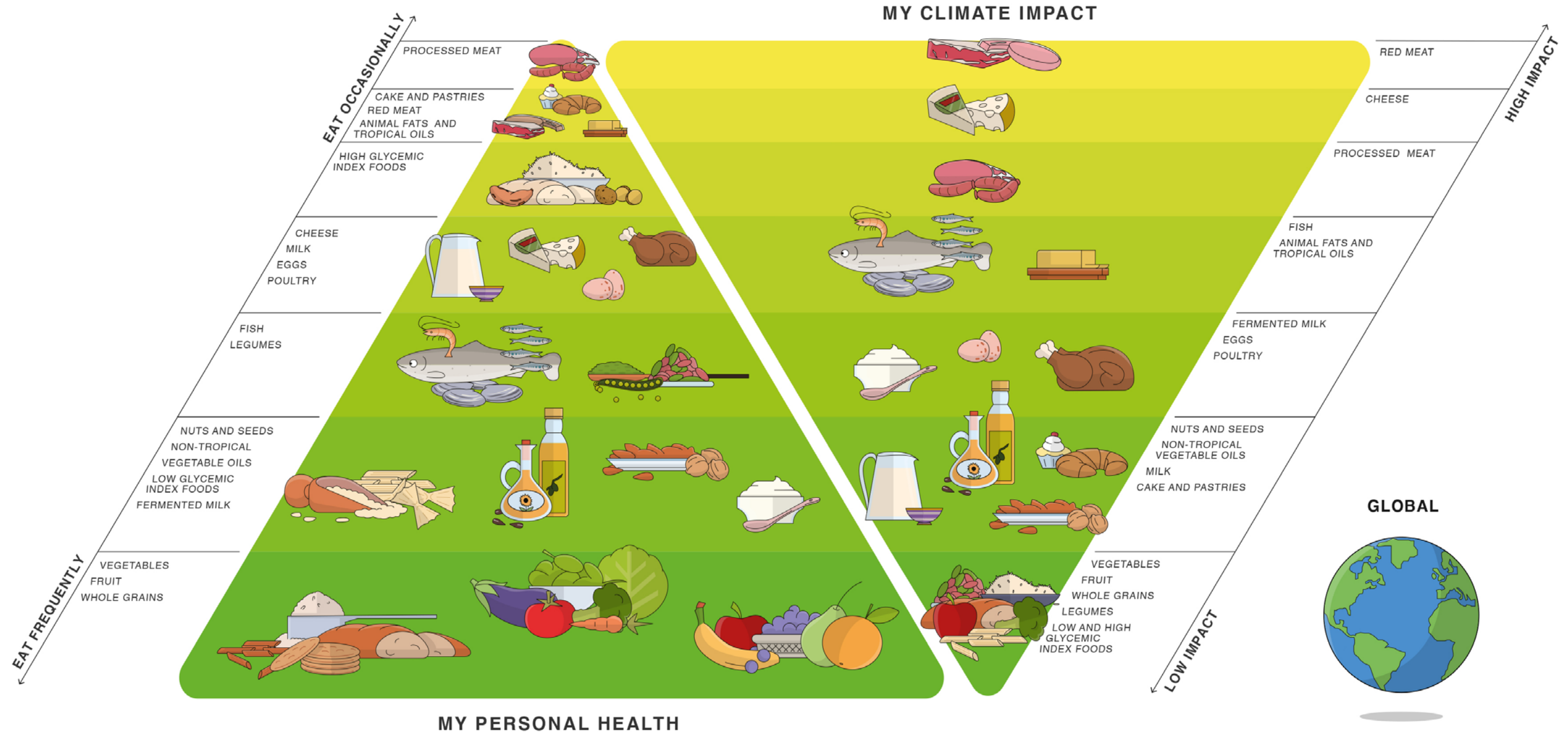
A practical tool for illustrating this strong link is the **Double Pyramid**. Placing the Health Pyramid side-by-side with the upside-down Climate Pyramid creates the Double Pyramid, which illustrates how two different but equally important objectives - protecting the health of people and the environment - can come together in a single food model. It shows how, generally, the food we are advised to eat in greater amounts also has the least impact on the environment and vice versa. This means that, by taking a responsible attitude to food, we can each ensure our well-being and that of the environment. The key elements of each pyramid will be summarized in the following paragraphs.





Double Pyramid - Global

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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**



The Health Pyramid presented on these pages is derived from a review of the scientific literature that correlates the consumption of certain foods by the adult population with the risk of contracting cardiovascular diseases. The perpetuation of incorrect food choices, in fact, can negatively affect the health and well-being of our cardio-circulatory system. For example, unbalanced eating habits are estimated to have been responsible for 9.1 million premature deaths from cardiovascular disease worldwide in 2016⁴. Within the health pyramid, the food that we should eat most frequently is shown in order of frequency, from bottom to top. The message conveyed is that **to prevent cardiovascular diseases and promote health, longevity and well-being**, regardless of culture and geographical location, **human diets must be based above all on plant-based foods**, especially fruit, vegetables and whole grain cereals, which are at the bottom of the Health Pyramid. Conversely, the foods positioned at the top should be occasionally eaten, because they are rich in saturated fats and salt, and associated with a high cardiovascular risk.

Finally, a distinction has been made in this Health Pyramid between *high and low glycemic index foods*. The glycemic index is an indicator that measures the *speed* of increase of glycemia⁵, i.e. the amount of sugar in the blood, after eating a particular food. When the glycemic index of a food is high (as, for example, in the case of potatoes, rice or white bread), our body quickly assimilates the sugars contained in the food, with an early return of the feeling of hunger and the risk of taking in more calories than one should. However, it is good to remember that while the glycemic index is a characteristic of each food, what matters is the combination of foods and the quantities that make up a meal and the general eating style.

The Climate Pyramid shown on these pages **is based on the anthropogenic greenhouse gas emissions** (Carbon Footprint) responsible for climate change. The method used to make the calculations is the Life Cycle Assessment (LCA) which, in this case, determines the amount of greenhouse gas emitted considering the entire supply chain, from agricultural to distribution and consumption of a food, including cooking, if necessary. This creates an overall picture of the environmental impact of a food, which is **expressed** as the mass of **carbon dioxide equivalent** (CO₂ - eq)⁶. All the emissions from a particular food are converted into a CO₂ - eq value, as if the system only emitted carbon dioxide, using the fixed parameters established by the Intergovernmental Panel on Climate Change (IPCC).

⁴ Riccardi, G., Vitale, M. & Vaccaro, O. Are Europeans moving towards dietary habits more suitable for reducing cardiovascular disease risk? Nutr. Metab. Cardiovasc. Dis. 30, 1857–1860 (2020).

⁵ The glycemic index measures the speed at which glycemia rises, not the amount by which it rises.

⁶ CO₂ equivalent: is a unit of measurement that expresses the impact on global warming of a certain amount of greenhouse gas compared to the same amount of carbon dioxide (CO₂).





Food culture is the most effective lever to redefine the relationship between man and food in concrete terms. Only by developing a food culture that is more attentive to the values of health and sustainability in all its forms can the great food emergencies of our century be successfully addressed, from access to food to preventing a wide range of diseases and respecting the environment. Culture has always been a result 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, neglecting the dissemination of a cultural and knowledge dimension, means planning short-term interventions, neglecting the need to tackle the root causes of the current difficulties.

In view of this, in order to reset the way we shall eat in the future, it is important *to promote local varieties and the excellence of ingredients, recover ancient flavors* that can be updated to suit modern tastes, *transfer knowledge and know-how*, restore the value of food as a connection *between generations*, promoting the simplicity and clarity of its benefits, while also making the most of the rich and complex reservoir of *conviviality*, while remembering to disseminate a culture *of flavor and the art of living* through authentic food, renewing the magic and amazement of food through its rituals and carefree pleasure, as an existential and cultural fuel.

All these cultural aspects are discussed in the following pages, which present **seven examples of Double Cultural Pyramids** for Africa, South Asia and East Asia, Latin America, Nordic Countries and Canada, Mediterranean Countries and the United States of America. The Double Pyramid model in fact contains a huge variety of food and cultural peculiarities that that can constitute a healthy and sustainable diet. In fact, there is no single model of a sustainable diet, but there are several that can be pursued in various areas of the planet, in an affordable, economical, safe, fair and culturally acceptable way. Without claiming to be exhaustive, the cultural pyramids presented here **show some examples of key foods and traditional practices that protect cardiovascular health and the environment.**





2.

Africa

Traditional diets throughout the African continent are to a large extent characterized by a cuisine that makes significant use of products of plant origin and includes green leafy vegetables, tropical fruit, pulses, tubers and whole grains, such as millet, sorghum and *teff*, a cereal native to the Ethiopian highlands. Animal products are eaten in moderate amounts and mainly consist of oceanic and freshwater fish, fermented milk and, to a lesser extent, game, poultry, beef and mutton.



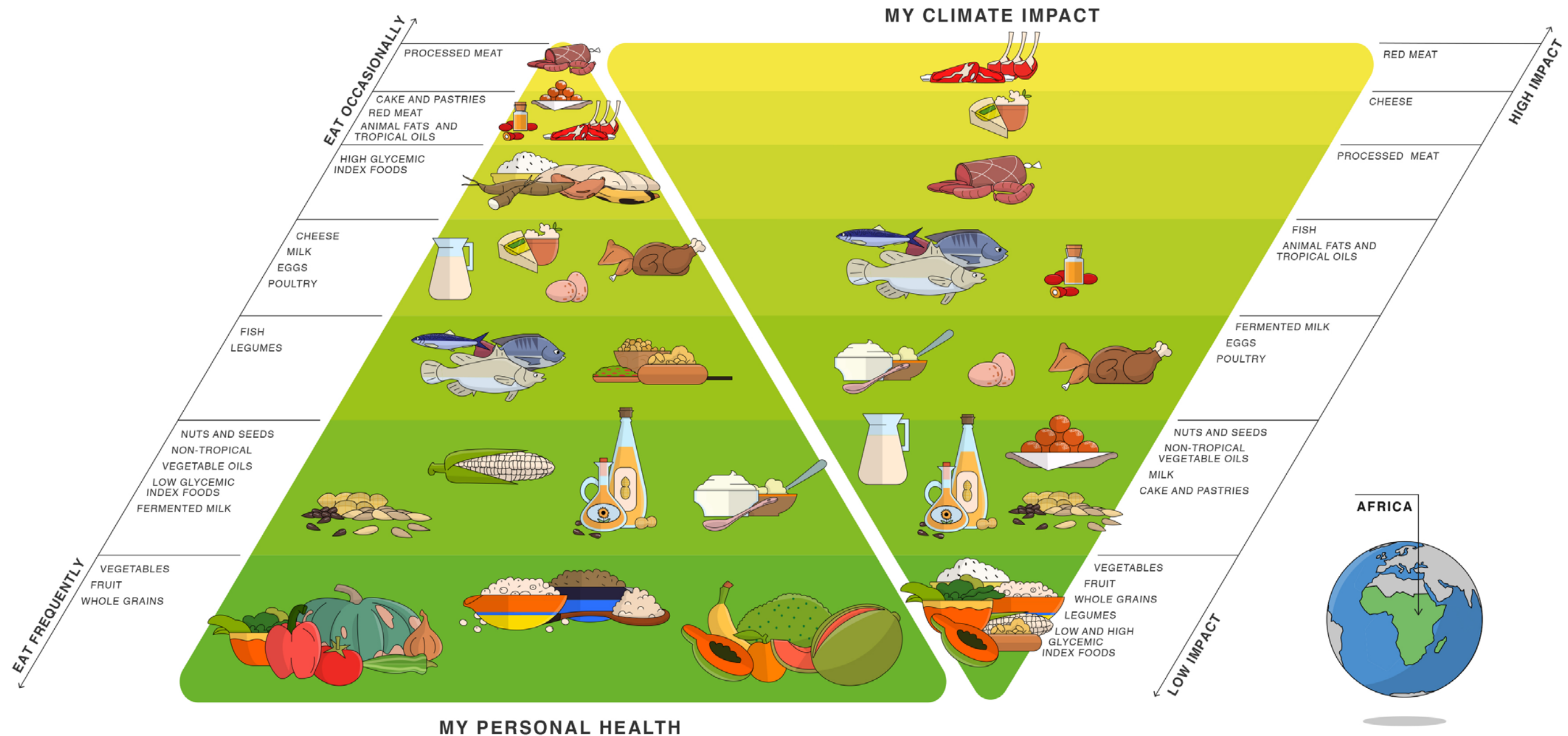
2.1 Characteristic foods included in the African Double Pyramid

Food group	Food
Vegetables	Green leafy vegetables (such as spinach, mustard leaves, cassava leaves, sweet potato leaves, pumpkin leaves), okra, pumpkins, onions, peppers, tomatoes
Fruit	Papaya, oranges, bananas, jackfruit, mandarins, melons
Whole grain	Millet, sorghum, teff
Nuts and seeds	Peanuts, sunflower and melon seeds
Non tropical vegetable oils	Sunflower oil, peanut oil
Low glycemic index foods	White corn flour
Fermented milk	Yogurt, fermented milk
Fish	Nile perch, tilapia, mackerel
Legumes	Chickpeas, lentils, black-eyed beans
Cheese	Cottage cheese, hard cheeses
Milk	Milk
Chicken	Chicken, guinea fowl
Eggs	Eggs
High glycemic index foods	Cassava, white rice, white bread, sweet potato, plantains
Red meat	Goat, lamb
Processed meat	Sausages, salted dried meat (e.g., Biltong)
Animal fats and tropical oils	Palm oil
Cakes and pastries	Sweet fried flour balls



Double Pyramid - Africa

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SOFT DRINKS: OCCASIONALLY
BE PHYSICALLY **ACTIVE** AND PRACTICE EVERYDAY **MINDFULNESS**



2.2 Countries represented

Nigeria, Democratic Republic of Congo, South Africa, Tanzania and Ethiopia. Different Countries, culturally and geographically, but with common traits, including the presence of a single dish based on a starchy ingredient with stewed vegetables, pulses or occasionally fresh fish or cooked meat, dressed with peanuts, spices and herbs. Also, traditionally, food is placed on a shared plate in the center of the table from which guests help themselves.



2.3 Popular dishes and interesting facts

Injera is a key food in both Ethiopian and Eritrean cooking and is made with teff flour. Mixed with water, this flour is used to prepare a kind of spongy pancake, with many bubbles on the surface and a slightly acidic flavor resulting from the fermentation of the basic dough. *Injera* is the basic ingredient of *zighini*, another typical Ethiopian (as well as Eritrean and Somali) dish consisting of the aforesaid pancake used to serve a spicy stew made with *berbere*, a blend of local spices, and chicken or beef, cooked vegetables, various pulses and fresh vegetables. The dish is traditionally eaten with the fingers, tearing off a piece of *injera* and using it to pick up food that is placed on top.

Entomophagy, or the human consumption of insects, is practiced in many Countries of the African continent. Around 470 species of insects, in particular caterpillars and locusts, are estimated to be routinely eaten in Africa, especially in central Africa. Many local populations also eat them because they believe that many edible insects have medicinal properties.

2.4 Environmental impact

Rising incomes in recent years and rapidly increasing urbanization have contributed to a radical change in African diets, bringing them closer to the Western model, rich in refined high-glycemic grains, fats, sugar and products of animal origin: all foods that should be consumed in moderation. As the Double Pyramid shows, this threatens people's health and that of the environment.



3.

South Asia

South Asia is home to a fifth of the world's population, encompassing a great variety of climates, cultures and traditions, including in terms of food. However, some of the traditional foods, such as green leafy vegetables, lentils, ghee and yogurt, have been known for more than five thousand years. The people who settled in the Indus Valley between 3300 and 1700 BC began to grow rice, wheat, barley, tamarind, eggplant and cucumber, making great use of spices, such as black pepper, ginger, cumin, coriander and turmeric root, dried and ground into an orange powder, and the saffron brought by the Greeks. This great variety of flavors is reflected in the widely used curries (masala), which are a mixture of spices pounded in a mortar with a composition that varies according to use and from region to region.



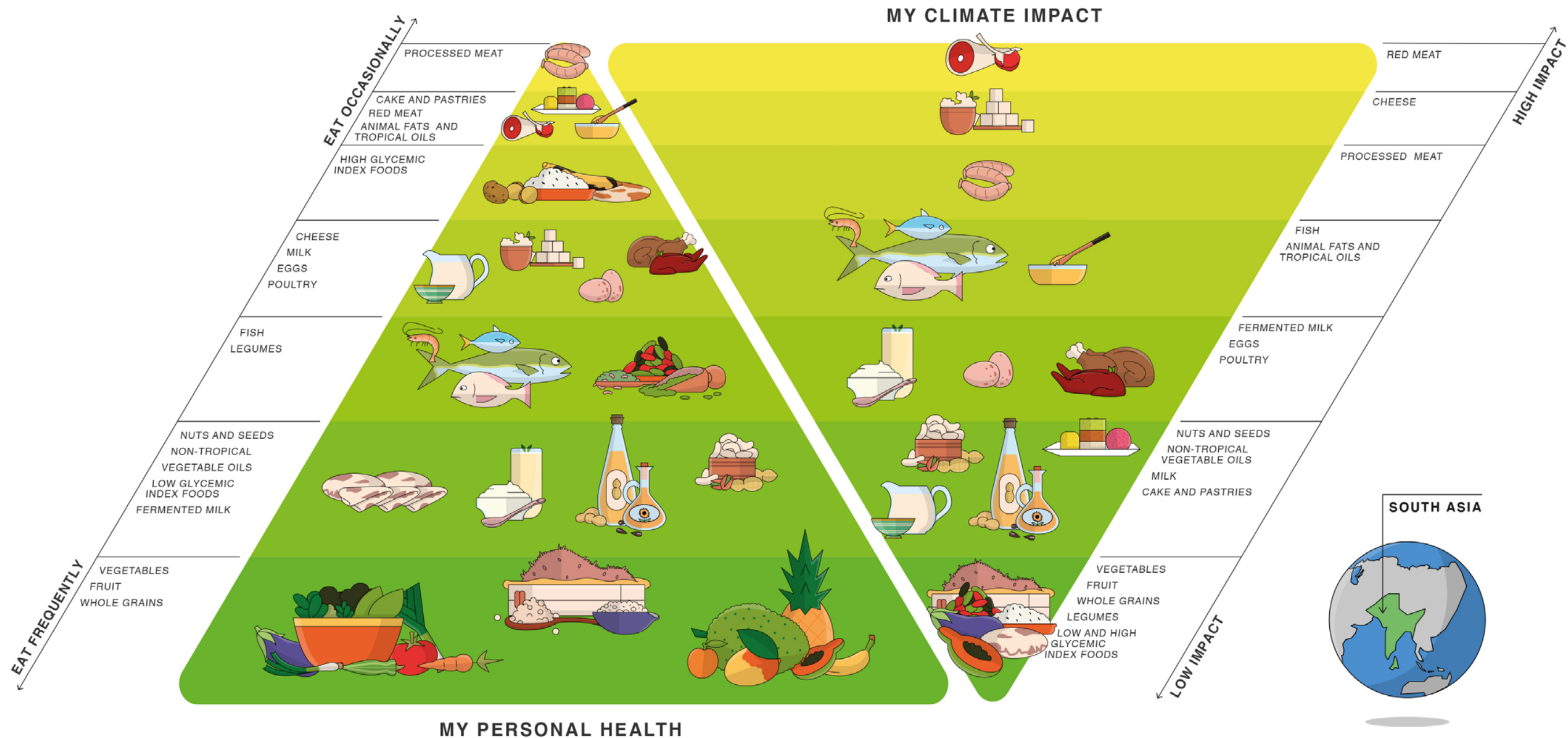
3.1 Characteristic foods included in the South Asian Double Pyramid

Food group	Food
Vegetables	Leafy vegetables (such as spinach, mustard leaves, fenugreek), okra, eggplant, onions, leeks and shallots, carrots, tomatoes
Fruit	Mango, papaya, orange and tangerine, pineapple, bananas, jackfruit
Whole grain	Brown rice, sorghum, millet
Nuts and seeds	Peanuts, cashews, pistachios
Non tropical vegetable oils	Sunflower oil, peanut oil
Low glycemic index foods	Chapati, roti (typical South Asian breads)
Fermented milk	Yogurt, lassi
Fish	King fish, white snapper, Indian mackerel, shrimp
Legumes	Black, red and green beans, split peas, red and green lentils
Cheese	Cottage cheese, paneer (a kind of fresh cheese)
Milk	Milk
Chicken	Chicken, duck
Eggs	Eggs
High glycemic index foods	Naan (leavened bread cooked in the traditional inverted bell-shaped clay ovens (Tandoors), white rice, potatoes, plantains
Red meat	Mutton, lamb
Processed meat	Chicken sausages
Animal fats and tropical oils	Ghee (clarified butter)
Cakes and pastries	Indian pastries (mithai)



Double Pyramid - South Asia

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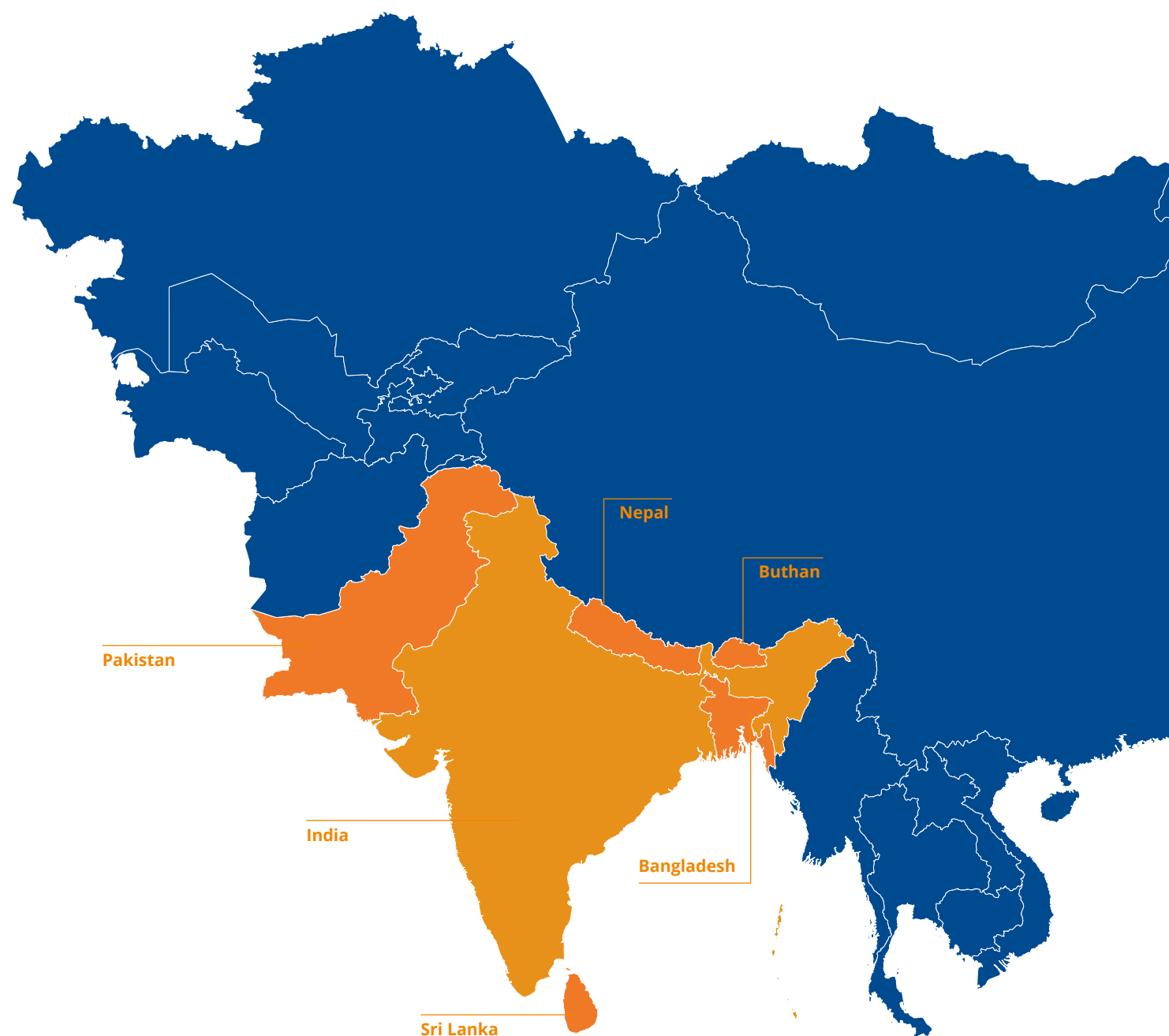


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SOFT DRINKS: OCCASIONALLY
BE PHYSICALLY **ACTIVE** AND PRACTICE EVERYDAY **MINDFULNESS**



3.2 Countries represented

India, Nepal, Bhutan, Sri Lanka, Pakistan and Bangladesh. Different Countries, culturally and geographically, where some common traits can be found, including the wide use of a great variety of spices and the strong presence of religious dictates that regulate the preparation and consumption of food. Street food is also a constant presence on the streets and alleys of South Asia and is often the source of at least one of the main meals of the day.



3.3 Popular dishes and interesting facts

The word *daal* describes various types of dried lentils, peas, beans and chickpeas, cooked in a thick soup, with onions and tomatoes and flavored with different spices. India and Pakistan are the biggest world producers of chickpeas, which are likely to have been introduced to the subcontinent by the Indian Mughal dynasty. Pulses are also used in the form of flour to prepare foods such as *papadum*, a crunchy wafer used as a snack, or side dish, in India, Pakistan, Bangladesh, Nepal and Sri Lanka. Papadum is made with flour from hulled black mung beans as well as chickpea or lentil flour.

The consumption of milk and dairy products is also rooted in South Asian tradition, and the health benefits of fermented milk have been documented in Indian Ayurvedic scriptures dating back to around 6000 BC. Yogurt and a similar curd are eaten on their own or with aromatic sauces and paired with curried meat and/or vegetables. *Lassi*, for example, is a well-known drink consisting of a blend of yogurt, or curd, water and spices, served savory, sweet or fruity, like the hugely popular *lassi* with mango.

3.4 Environmental impact

India, Sri Lanka and Bangladesh are among the Countries most affected by the effects of climate change, as their lands are subject to recurrent floods, cyclones, earthquakes, landslides and droughts. Despite adverse climatic events, they have maintained a steady growth in food production over the past three decades. However, according to the latest FAOSTAT data, the emission of methane from rice cultivation in South Asia is responsible for around 15% of agricultural greenhouse gas emissions (in kg of CO₂ - eq.)⁷.

7 FAO. FAOSTAT. (2021). <http://www.fao.org/faostat/en/#data>



4.

East Asia

The Countries of East Asia have an ancient culture in many areas, including food. Despite the geographical differences that exist in such a vast area, many common elements can be found, including the methods used to preserve food (e.g. salting, pickling, drying and fermentation); fast cooking methods, such as stir-frying; the use of rice as a staple food (in Japan, the term *Gohan*, rice, in a broader sense means “food” or “meal”); the widespread use of soy which, in its various forms (whole, cooked or fermented), is the basis of many dishes; the use of seaweed in the kitchen; the intensive use of aromas with an intense flavor, such as garlic and ginger; the custom of drinking tea.



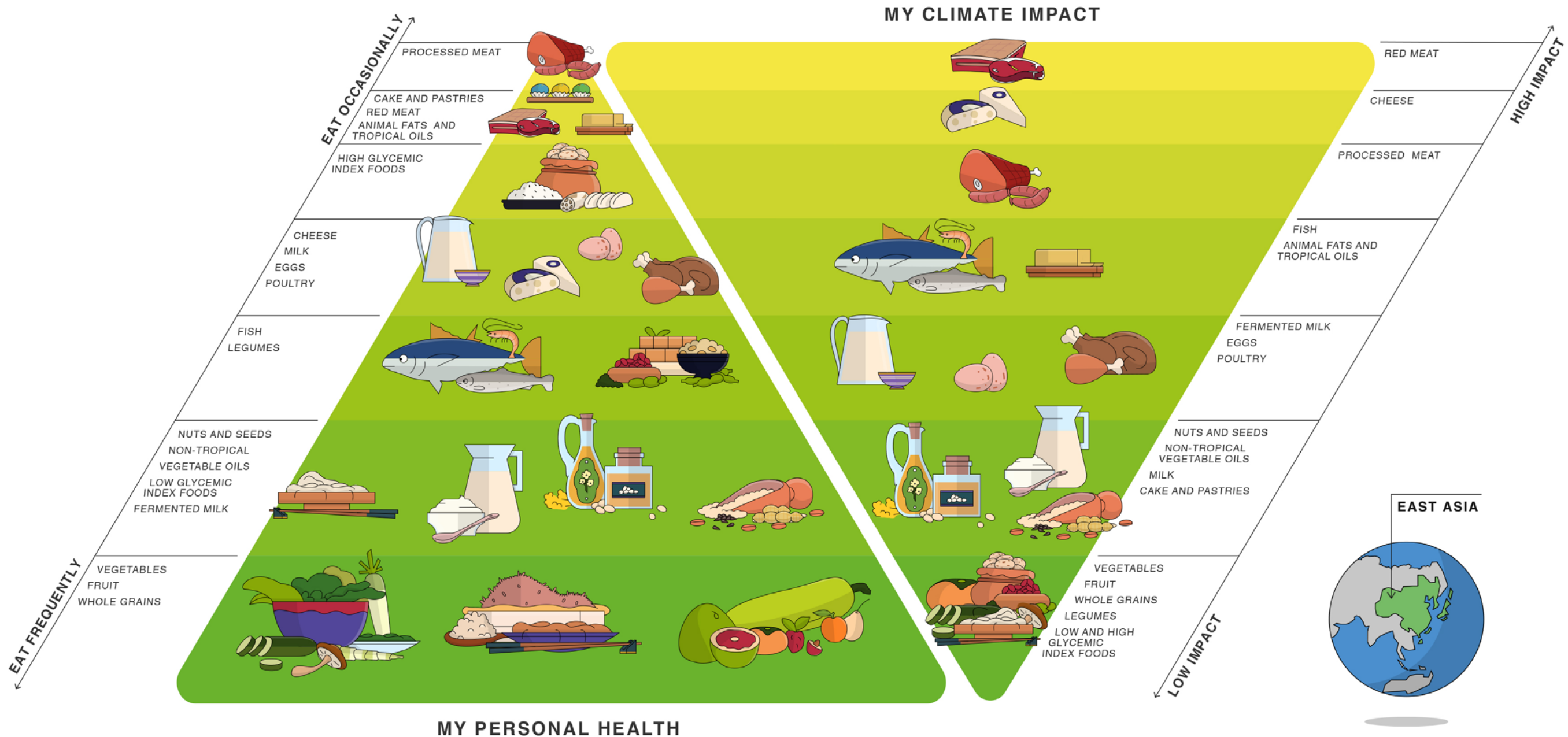
4.1 Characteristic foods included in the East Asian Double Pyramid

Food group	Food
Vegetables	Leafy vegetables (including pak choi, Chinese cabbage, spinach, mustard leaves, fenugreek), daikon, cucumber, seaweed (nori, wakame, konbu), bamboo shoots, mushrooms (e.g., shiitake, enokitake)
Fruit	Winter melon, lychee, orange and tangerine, nashi (Japanese pear), persimmon, pomelo
Whole grain	Brown rice, millet, soba noodles (Japanese buckwheat noodles)
Nuts and seeds	Peanuts, pine nuts, sesame seeds
Non tropical vegetable oils	Soybean oil, canola oil
Low glycemic index foods	Noodles (spaghetti-shaped pasta that can be made with rice, soft wheat or egg)
Fermented milk	Yogurt, fermented milk
Fish	Tuna, salmon, shrimps
Legumes	Mung and adzuki beans, broad beans, soybeans/edamame, tofu
Cheese	Fresh and hard cheeses
Milk	Milk
Chicken	Chicken, duck
Eggs	Eggs
High glycemic index foods	Bao (steamed stuffed bun), white rice, potatoes, lotus root
Red meat	Beef, pork
Processed meat	Sausages, ham
Animal fats and tropical oils	Butter
Cakes and pastries	Sweet rice cakes (e.g. mochi)



Double Pyramid - East Asia

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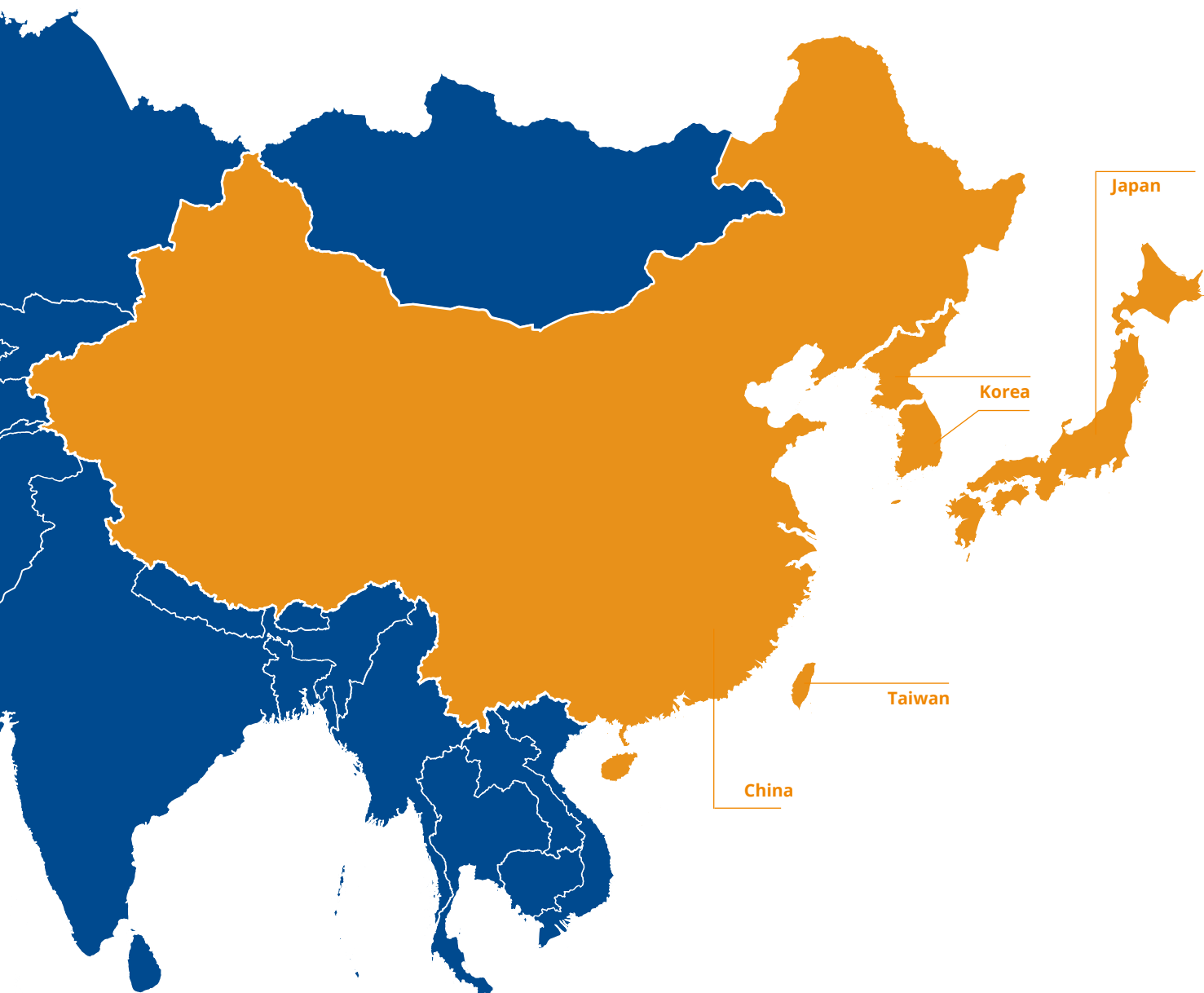


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SOFT DRINKS: OCCASIONALLY
BE PHYSICALLY **ACTIVE** AND PRACTICE EVERYDAY **MINDFULNESS**



4.2 Countries represented

China, Korea, Taiwan and Japan. These are different Countries in terms of history, geography, available resources, climate, religion and lifestyles, but they share some characteristic and peculiar traits, such as the use of chopsticks to eat, and bowls, instead of plates, to serve food. Menus generally follow a fixed pattern, consisting of rice, a soup, a protein element and some side dishes (for example vegetables and pickles). Finally, traditionally, great attention is paid to conviviality, with the family gathering for dinner to eat and share dishes placed in the middle of the table and from which everyone helps themselves.



4.3 Popular dishes and interesting facts

Milk and dairy products are not traditional East Asian foods, as, historically, the population has not developed the habit of drinking the milk of domestic animals, and cattle were mainly used to work the fields. Furthermore, the majority of the population are congenitally lactose intolerant. However, with the introduction of milk as a staple food in modern China, the country has become one of the world's biggest producers. Milk and dairy products are also gaining popularity in Japan. For example, *Sakura* soft cheese, made in Hokkaido, was recently recognized and awarded internationally. Conversely, soy milk⁸ has always been part of the tradition and, nowadays, the market has expanded to include other beverages made with almonds, walnuts or coconut, which are gaining popularity.

Tea drinking is a tradition that originates in China and has become an integral part of every East Asian culture. It has very ancient origins and archaeologists estimate that tea leaves infused in water have been drunk for over 500,000 years. Its daily consumption is not limited to the private sphere but has deep links with religion, especially Buddhism in China, Korea and Japan, for which there are different rites and cultures. However, the custom of drinking tea in special “tea rooms” is disappearing due to rapid changes in these societies, which are increasingly marked by a dynamic lifestyle.

4.4 Environmental impact

In East Asian Countries with coastlines, fish is a very important food. In Japan, for example, dried fish is the staple food used to crate many dishes, including the broth (dashi) for soups. However, its high consumption threatens national fish stocks: over 70% are over-fished or depleted⁹.

⁸ Regardless of the various exceptions found in the various Countries, EU regulations only allow the name “milk” to be used for products of animal origin, not plant products such as soy or rice.

⁹ Pauly, D., Palomares, M. L. D. & Zeller, D. Sea Around Us Concepts, Design and Data. (2020). at <searoundus.org>
145. Wendling, Z. et al. Environmental Performance Index. (2018). at <<https://epi.yale.edu/>>



5.

Latin America

Almost all climates can be found in this geographical area, which implies a great variety of foods. Long before Europeans arrived in the region, indigenous peoples had an elaborate system of irrigation and terracing to grow potatoes, corn and beans, which remain the staples of today's diets. Chilies, avocados, peanuts and cocoa were endemic, while Europeans brought livestock, citrus trees, wheat and almonds. The result today is a unique blend of tradition, innovation and integration, with the potential to eat in a healthy and sustainable way.



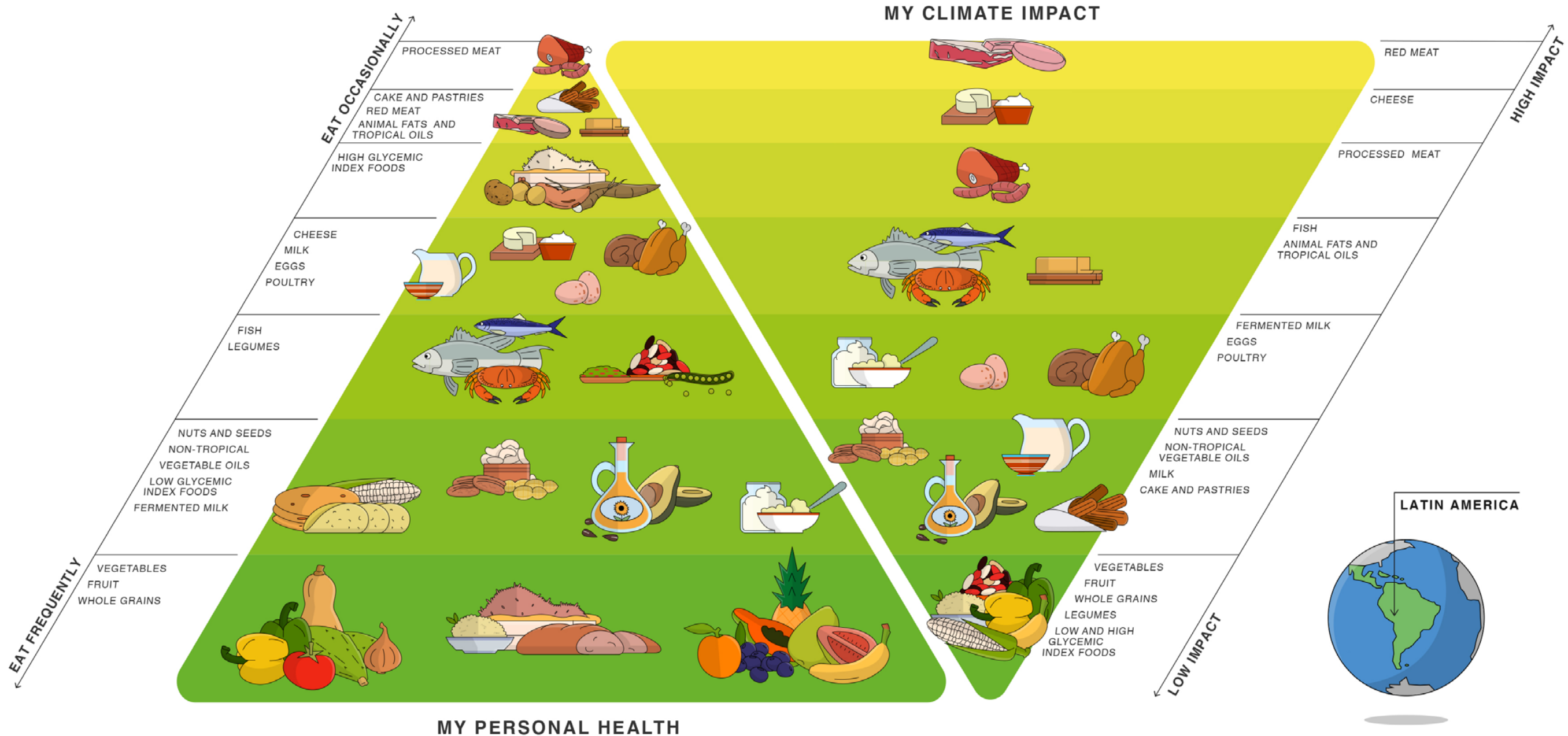
5.1 Characteristic foods included in the Latin American Double Pyramid

Food group	Food
Vegetables	Yellow and green bell peppers, onion, pumpkin/squash, tomato, nopal (cooked cactus pads)
Fruit	Açaí, pineapple, papaya, tangerine, banana, guava
Whole grain	Brown rice, quinoa, whole grain bread
Nuts and seeds	Peanuts, cashews, pecans
Non tropical vegetable oils	Sunflower oil, avocado oil
Low glycemic index foods	Corn tacos and tortillas (types of flat, unleavened bread), corn
Fermented milk	Yogurt, kefir
Fish	Crab, sea bass, mackerel
Legumes	Red, white, brown and black beans, peas, chickpeas
Cheese	Sour cream, queso blanco (a type of cheese widespread in South America, with different varieties and consistencies)
Milk	Milk
Chicken	Chicken, turkey
Eggs	Eggs
High glycemic index foods	White rice, potatoes, sweet potato, cassava
Red meat	Beef, pork
Processed meat	Sausages, ham
Animal fats and tropical oils	Butter
Cakes and pastries	Churros (sweet of fried batter)



Double Pyramid - Latin America

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BE PHYSICALLY **ACTIVE** AND PRACTICE EVERYDAY **MINDFULNESS**



5.2 Countries represented

South and Central American Countries, including *Argentina, Brazil, Colombia, Mexico, and Peru*. Different Countries and climates with ancient pre-Columbian traditions combined with European influences, especially in urban areas, where diets tend to be more diversified.



For example, *Mexican cuisine*, which was recognized by UNESCO as part of the intangible cultural heritage of the world in 2010, is characterized by large amounts of beans and corn. *Brazilian cuisine*, however, varies according to the climate and region, with staples like rice and beans, plus local peculiarities, like those of *Bahía*, with their African roots. *Peruvian cuisine* is very different from that of other South African Countries, particularly because of the strong influence of Inca culture, and is rich in typical foods of the Andean area. *Argentine cuisine* is characterized by the predominant use of meat and wheat flour, and by Italian, Spanish and French influences. Finally, *Chilean cuisine* is also a melting pot resulting from indigenous traditions mixing with those of the Spanish colonial period, with subsequent Italian, German and French influences, leading to the birth of Creole cuisine, characterized by simple and tasty but not particularly spicy delicacies.

Finally, mate deserves a special mention. This caffeine-rich beverage typical of South America is made by infusing dried leaves of yerba mate and traditionally served in containers made from empty pumpkins.





5.3 Popular dishes and interesting facts

Bell peppers and chilies are key ingredients of South American cooking. There are sweet and spicy varieties, and they are used in many creative ways, for example to color and flavor marinades for *ceviche*, a dish of fish and/or seafood marinated in lemon and spices. Wild tomatoes originate from the Andes and their name is derived from the Aztec word *tomatl*, with which they arrived in Europe in the sixteenth century on the ships carrying the *conquistadores*.

Entomophagy, or the human consumption of insects, is practiced in many Latin America Countries. Insects including caterpillars, grasshoppers, termites and beetles are eaten in Brazil, Colombia, Peru and Mexico.

5.4 Environmental impact

Avocado is a fruit that requires large amounts of water and is often exported, all over the world by Countries suffering water shortages, including Mexico, Peru and Chile. Increasing worldwide demand is likely to worsen this situation.

Another characteristic food from this area that has recently become extremely popular abroad is quinoa (a pseudo-cereal with nutritional characteristics that make it part of the whole grain group). Booming demand, however, is associated with an intensification of production and a greater use of fertilizers, which contribute to increasing greenhouse gas emissions.





6.

Mediterranean Countries

Mediterranean 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.



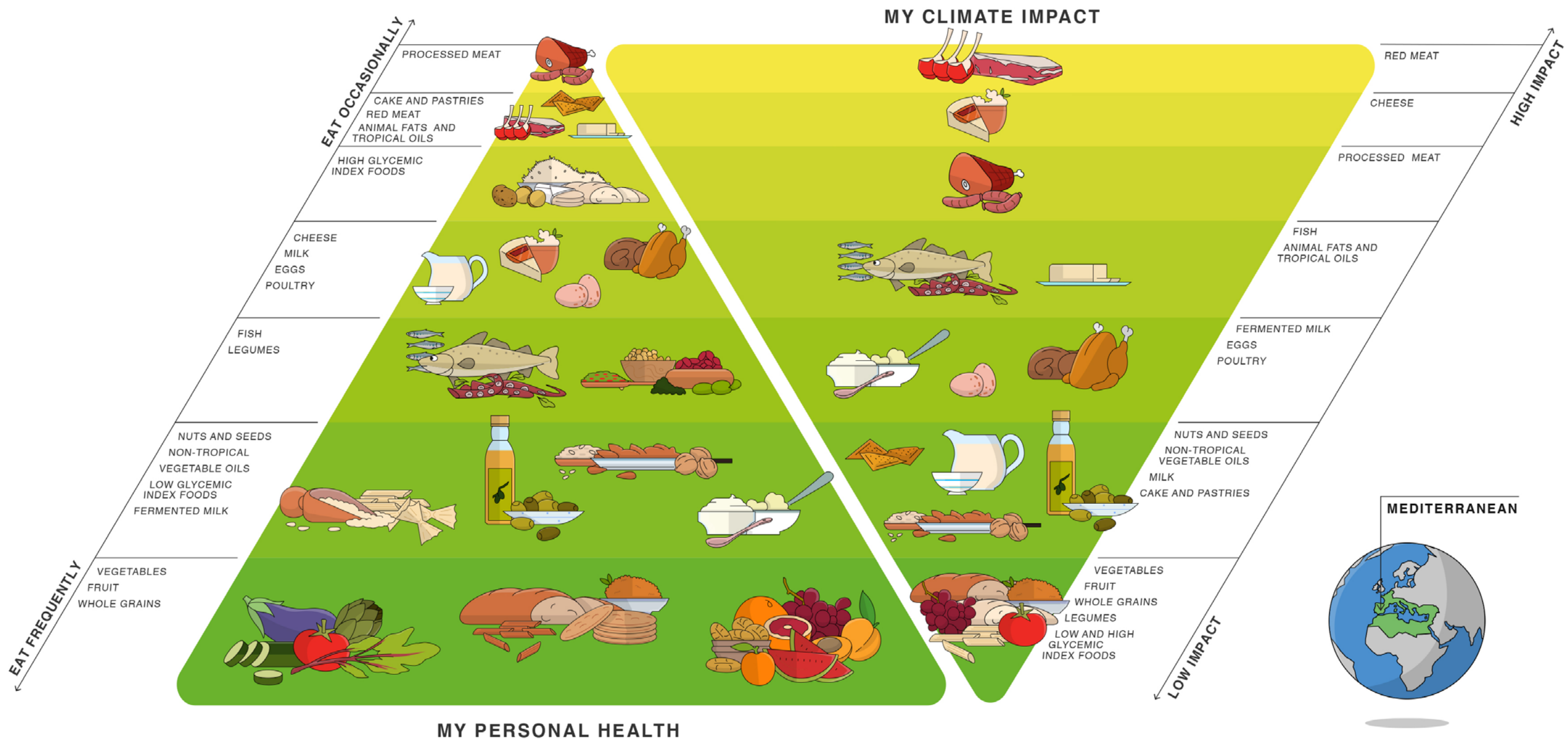
6.1 Characteristic foods included in the Mediterranean Double Pyramid

Food group	Food
Vegetables	Tomato, eggplant, cucumber, artichoke, chard
Fruit	Orange, dried fig, apricot, grapes, pomegranate, watermelon
Whole grain	Whole grain rice, whole grain bread, bulgur (cracked wheat)
Nuts and seeds	Almonds, sesame seeds/tahini (sesame seed paste), walnuts
Non tropical vegetable oils	Olive oil, olives
Low glycemic index foods	Pasta, pearl barley
Fermented milk	Yogurt, kefir
Fish	Sardines, cod, octopus
Legumes	Chickpeas, lentils, fava beans
Cheese	Ricotta, hard cheeses
Milk	Milk
Chicken	Chicken, turkey
Eggs	Eggs
High glycemic index foods	White rice, potatoes, white bread, pita (a type of round, leavened, flat bread made with wheat flour), cous-cous
Red meat	Beef, lamb
Processed meat	Sausages, ham
Animal fats and tropical oils	Butter
Cakes and pastries	Sweets made with phyllo pastries (a type of puff pastry prepared in very thin separate sheets)



Double Pyramid - Mediterranean Countries

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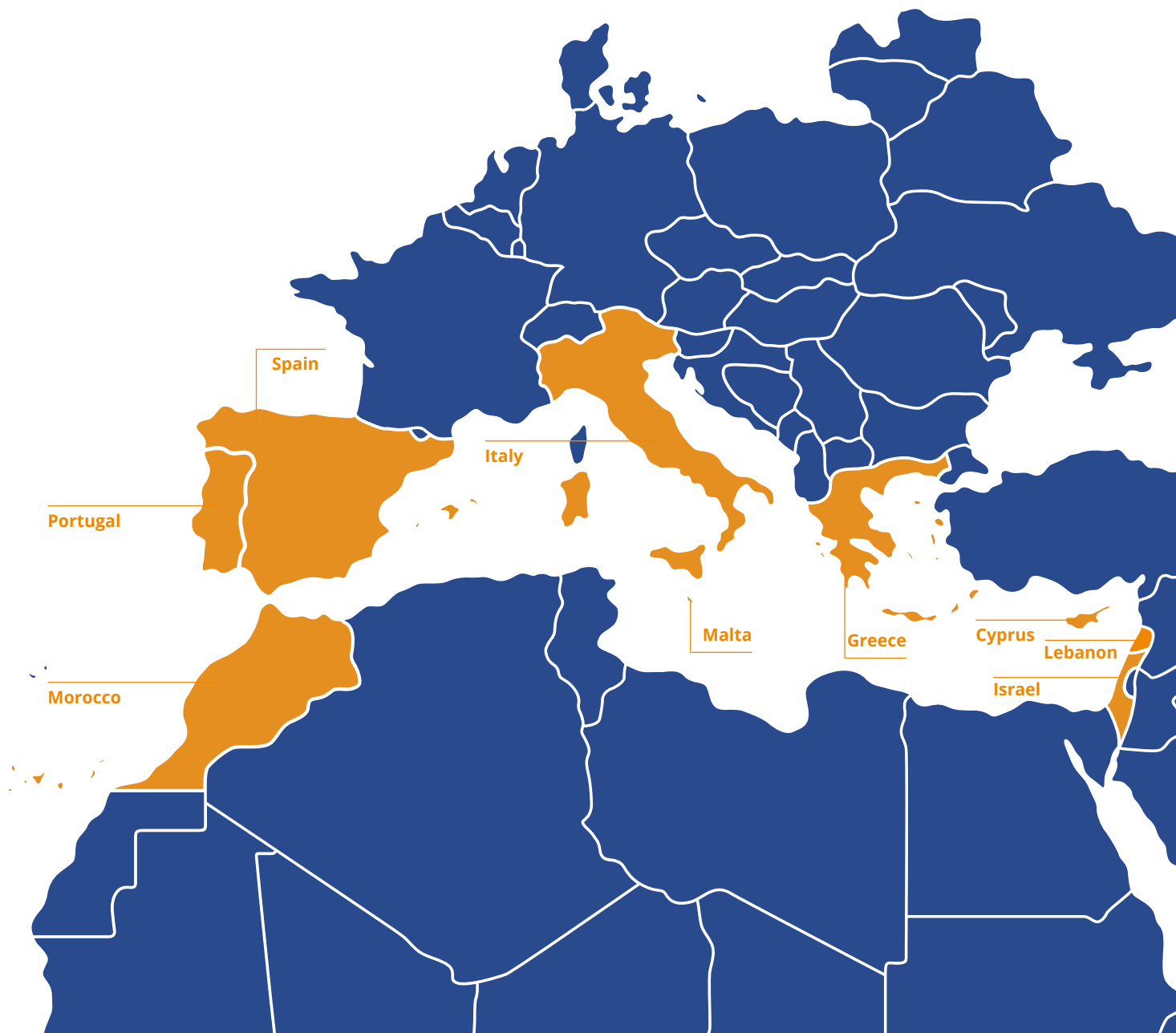
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BE PHYSICALLY **ACTIVE** AND PRACTICE EVERYDAY **MINDFULNESS**



6.2 Countries represented

Spain, Portugal, Greece, Italy, Malta, Cyprus, Morocco, Israel and Lebanon. The geographical variety is reflected in the cuisine, which is very rich and ranges from the typical sweet and sour flavors of Sicily to spicy North African nuances, and embraces traditions, eating patterns, cooking methods and lifestyles that also differ significantly.

The values of hospitality and closeness are very important in all Mediterranean Countries. Sharing meals also plays a very important social role and the handing down of culinary knowledge through the generations allows the tradition, characterized by the recurring presence of common ingredients consumed frugally and in moderation, to be kept alive.



6.3 Popular dishes and interesting facts

The Mediterranean diet, an *intangible cultural heritage of humanity* (UNESCO, 2010), is characterized by the abundant use of pulses. Chickpeas are an example of how a single ingredient can be combined in many different dishes, including: 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* (type of thin, unleavened pancake or crêpe) or French *socca* (a type of farinata made only with chickpea flour).

The importance of the Mediterranean diet was studied in the second half of the twentieth century by the American researcher *Ansel Keys*, who discovered, through the famous Seven Countries Study¹⁰, that people in Italy and Greece lived longer and suffered less from cardiovascular diseases than those living in the United States and Finland. However, it is important to remember that the Mediterranean diet is not just a set of foods but includes an approach to food in which conviviality, biodiversity and respect for the land play a fundamental role.

6.4 Environmental impact

Fish is an important resource for the Countries of the Mediterranean basin and its consumption varies depending on proximity to the sea. With around 17,000 different species, the Mediterranean has a rich biodiversity. In relatively recent times, however, the Mediterranean Sea has been defined as being “*under siege*” because of the intense pressure exerted by human activities, which has caused acidification of the water, invasions of alien species, pollution and overfishing. In particular, according to the latest FAO report on the state of fisheries and aquaculture in the Mediterranean and Black Seas (2017), over 60% of fish stocks are currently fished at unsustainable rates¹¹.

¹⁰ The study began in 1958 and involved men between the ages of 40 and 59 in 7 different countries: United States, Finland, Holland, Italy, Croatia-former-Yugoslavia, Serbia-former-Yugoslavia.

¹¹ FAO. The State of World Fisheries and Aquaculture 2020. (FAO, 2020). doi:10.4060/ca9229en
WWF. <https://www.wwf.it/ambiente/mare/mediterraneo/>



7.

Nordic Countries and Canada

Because of their similar latitude, the Nordic Countries and Canada share very similar natural ecosystems and, over the decades, their populations have developed similar farming and farming practices. Long coastlines are another fundamental feature of all these Countries, which make fishing and aquaculture a fundamental economic activity and a precious source of food. For example, the ancient custom of smoking and drying fish dates back to the Vikings, when cod was traditionally smoked or dried on racks for several months. Thanks to the ideal temperature, the wind, local knowledge and various skills, the fish could be kept for very long periods of time.



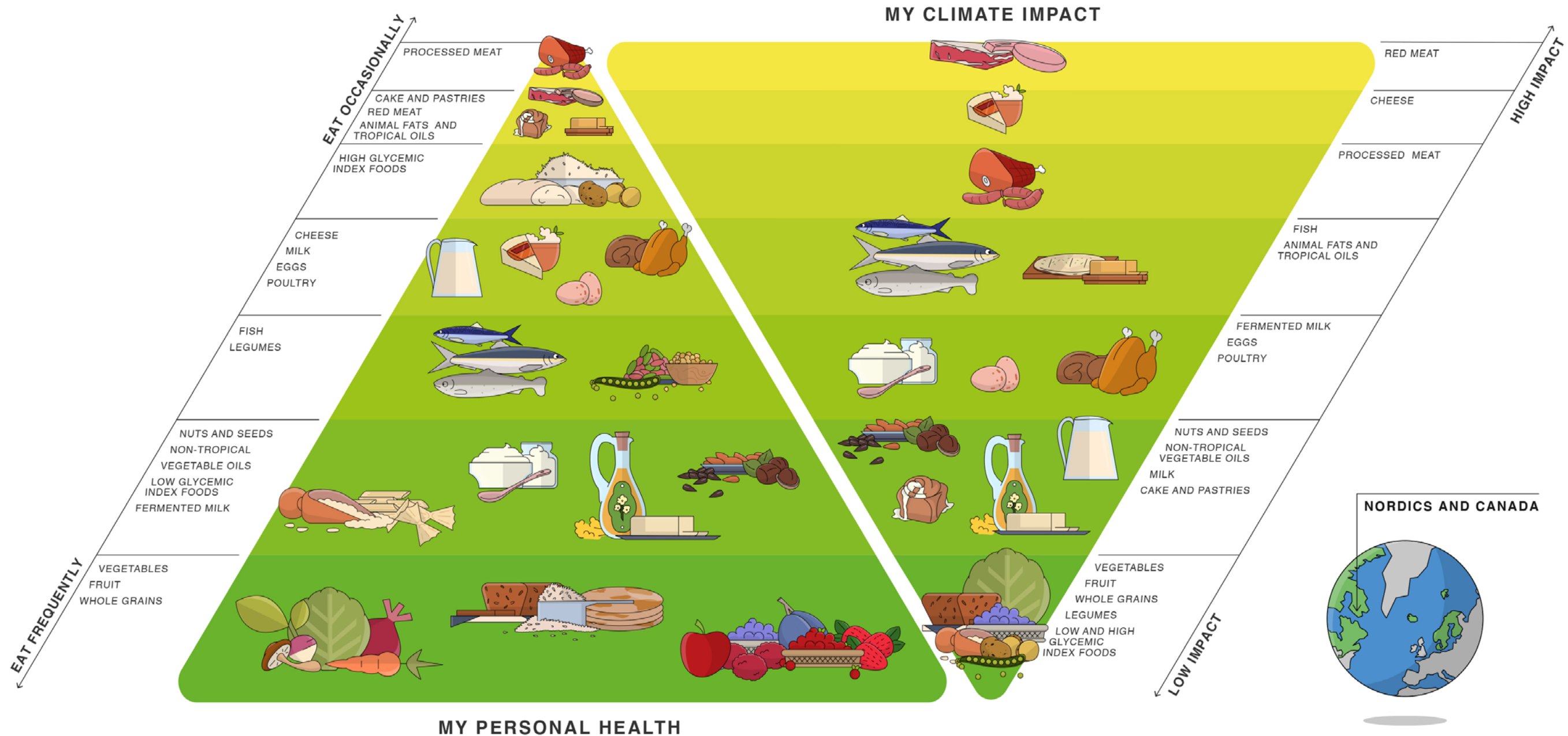
7.1 Characteristic foods included in the Double Pyramid of the Nordic Countries and Canada

Food group	Food
Vegetables	Beetroot, carrot, mushroom, cabbage, turnip
Fruit	Raspberry, strawberry, blueberry, plum, apple, cranberry
Whole grain	Rye bread, rolled oat, whole grain flatbreads
Nuts and seeds	Almonds, hazelnuts, sunflower seeds
Non tropical vegetable oils	Canola oil, soft margarine
Low glycemic index foods	Pasta, barley
Fermented milk	Yogurt, skyr
Fish	Salmon, herring, mackerel
Legumes	Chickpeas, peas, beans
Cheese	Cottage cheese, hard cheeses
Milk	Milk
Chicken	Chicken, turkey
Eggs	Eggs
High glycemic index foods	White rice, potatoes, white bread, refined flat breads
Red meat	Beef, pork
Processed meat	Sausages, ham
Animal fats and tropical oils	Butter
Cakes and pastries	Kanelbull (or cinnamon rolls, leavened cake containing a thin layer of butter, sugar and cinnamon)



Double Pyramid - Nordic Countries and Canada

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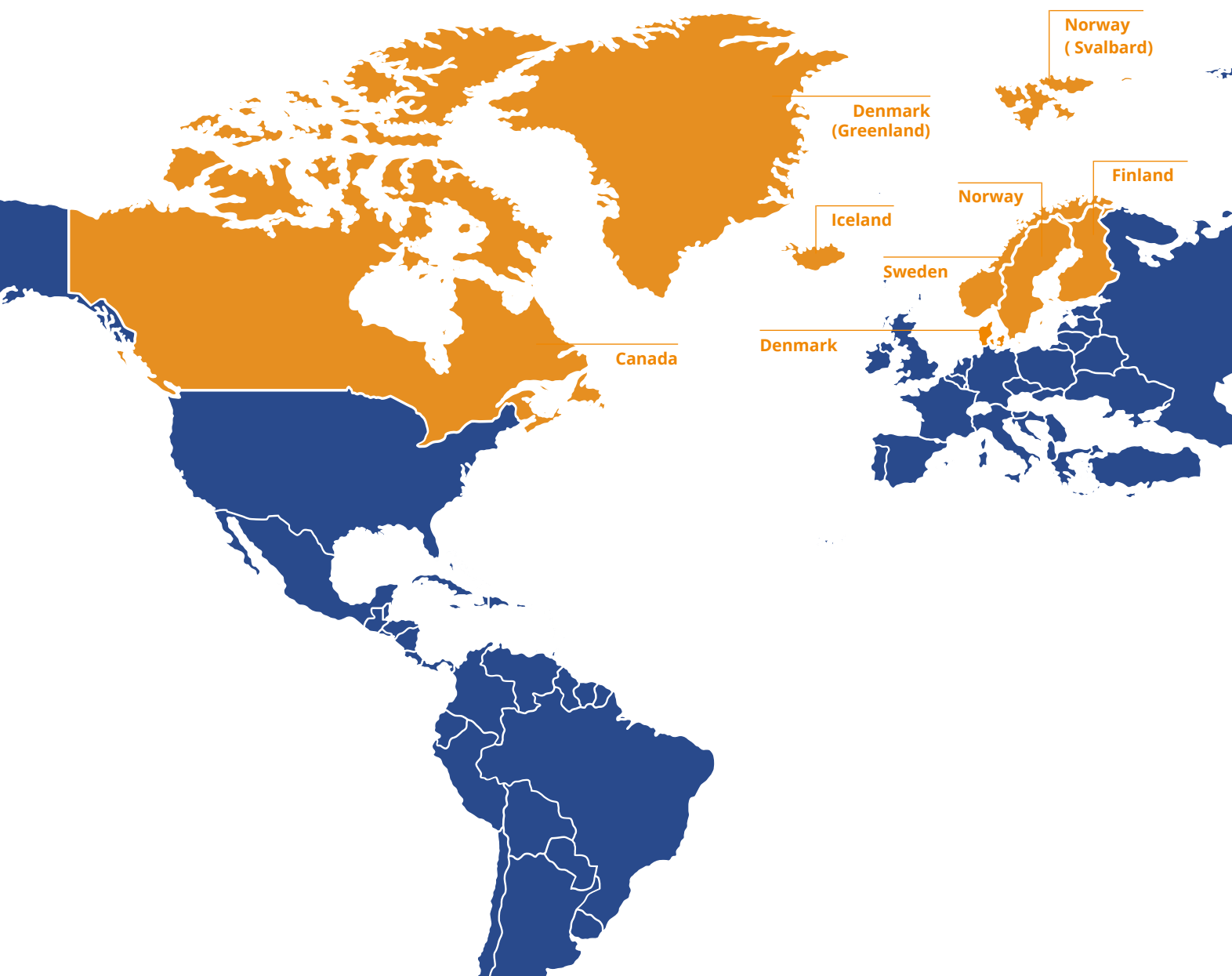


DAILY CONSUMPTION: **WATER**: AT LEAST 2 LITERS | **COFFEE OR TEA**: MAX 3 CUPS | **WINE**: MAX 1-2 GLASSES | **BEER**: MAX 1 CAN | **SALT**: MAX 1 TEASPOON
SOFT DRINKS: OCCASIONALLY
BE PHYSICALLY **ACTIVE** AND PRACTICE EVERYDAY **MINDFULNESS**



7.2 Countries represented

Finland, Norway, Sweden, Denmark, Iceland and Canada. In these Countries, breakfast is traditionally the main meal and includes a great variety of sweet and savory foods. Lunch, on the other hand, can range from a hot meal, such as soup, to a quick slice of bread with cheese, spreads, and salad. Finally, dinner is usually served in the late afternoon and normally includes a meat or fish dish. However, in both Northern Europe and Canada (but also in much of the globalized world) the tradition of eating three meals a day is becoming less frequent and, for convenience, more meals are being eaten outside the home.



7.3 Popular dishes and interesting facts

In the collective imagination, due to their low temperatures, the Nordic Countries tend to be associated with a cuisine that is rich in fats and products of animal origin, to protect people from the harsh climate. However, in order to promote healthy, locally sourced ingredients, in 2004 the governments of the area promoted *the development of a new Nordic diet, attentive to health, environmental sustainability and seasonality*, which emphasizes the consumption of traditional local ingredients to make the diet easily accessible to the population.

The relatively low temperatures and long hours of daylight during the summer months provide the ideal conditions for growing a *wide variety of berries*: from strawberry, blueberry, blackberry, raspberry, cranberry (of which Canada is one of the biggest producers), to wild varieties of cranberry, cloudberries, black and red currants, gooseberry and arctic raspberry, which can be harvested in the wild between May and October.

Finally, coffee deserves a special mention. All Nordic Countries, including Canada, are among the top 10 consumers in the world.

7.4 Environmental impact

Forests cover 38% of Canada and about 70% of Sweden and Finland, and their cold and lush nature is home to numerous wild animals such as buffalo, reindeer, bear, deer, wild boar and many species of birds. However, deforestation poses a significant threat to natural resources, with millions of hectares stolen from wildlife each year, a reduction in biodiversity and a decrease in carbon-absorbing capacity.



8.

United States of America

As the biggest “melting pot” in the world, the United States of America (USA) are home to a mixture of different origins, religions and cultures, which nonetheless manage to build a shared and widespread identity. The Country's cultural wealth is associated with its geographical wealth, as the USA is the third biggest Country in the world. This is reflected in a great diversity of food habits which, for practical reasons, can be divided into four large groups: North-Eastern USA, Western USA, Midwestern USA, Southern USA. The South features traditional African-American dishes, sometimes referred to as “*soul food*”, while the North-East includes more seafood, the Midwest meat and poultry, the West an abundance of seafood, dairy products, fruit and vegetables which have created cuisines that emphasize fresh, local produce.



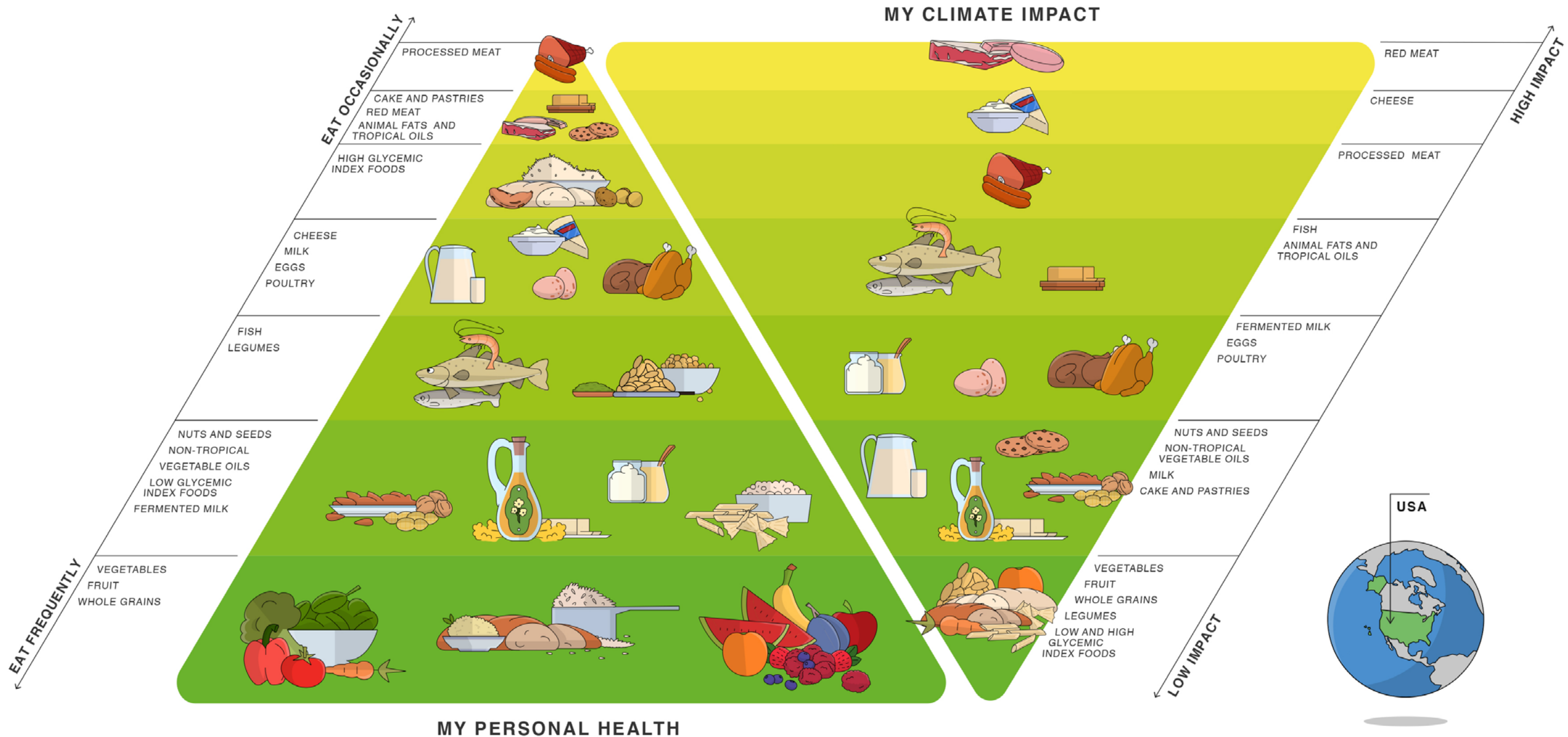
8.1 Characteristic foods included in the USA Double Pyramid

Food group	Food
Vegetables	Tomato, carrot, bell pepper, broccoli, spinach
Fruit	Apple, berries, banana, orange, melon, plum
Whole grain	Rolled oat, quinoa, whole grain bread
Nuts and seeds	Almonds, peanuts, walnuts
Non tropical vegetable oils	Canola oil, soft margarine
Low glycemic index foods	Pasta, pearl barley
Fermented milk	Yogurt, buttermilk
Fish	Salmon, cod, shrimps
Legumes	Chickpeas, lentils, beans
Cheese	Cream cheese, Cheddar (hard cheese)
Milk	Milk
Chicken	Chicken, turkey
Eggs	Eggs
High glycemic index foods	White rice, potatoes, white bread, sweet potatoes
Red meat	Beef, pork
Processed meat	Hot dogs, ham
Animal fats and tropical oils	Butter
Cakes and pastries	Cookies (biscuits, usually round, flat, soft and enriched with chocolate chips, oats, raisins, nuts, or other types of dried fruit)



Double Pyramid - United States of America

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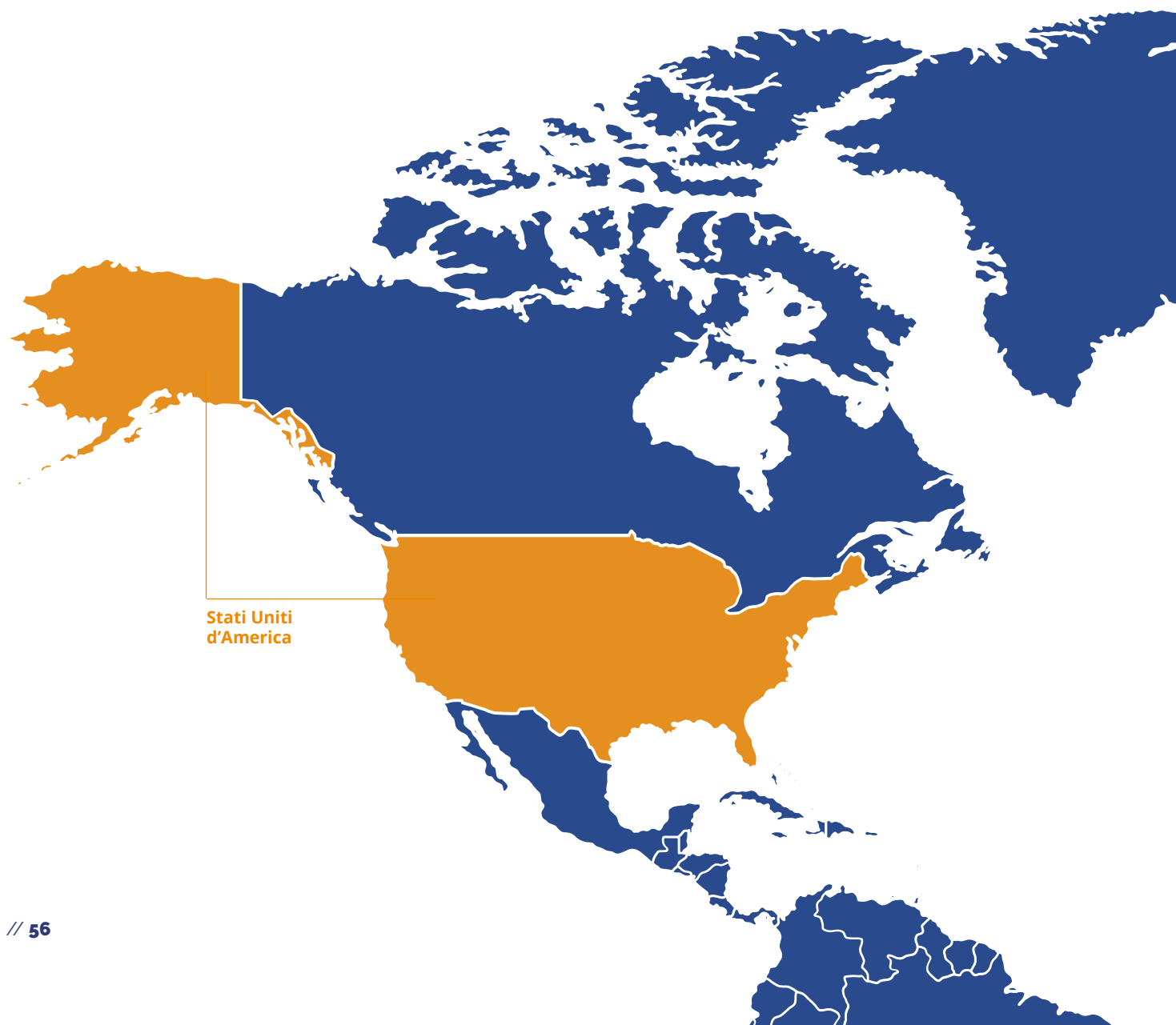


DAILY CONSUMPTION: **WATER**: AT LEAST 2 LITERS | **COFFEE OR TEA**: MAX 3 CUPS | **WINE**: MAX 1-2 GLASSES | **BEER**: MAX 1 CAN | **SALT**: MAX 1 TEASPOON
SOFT DRINKS: OCCASIONALLY
BE PHYSICALLY **ACTIVE** AND PRACTICE EVERYDAY **MINDFULNESS**



8.2 Countries represented

Continental United States of America. The geographical variety in these States is reflected in the type of food consumed. However, some recurring (non-exhaustive) patterns can be found, despite the growth in meals being eaten away from home, to adapt to the demands of modern life. For example, breakfast is traditionally large and includes both sweet and savory foods, such as fruit juices, muffins, milk cereal, donuts, pancakes with maple syrup, American-style coffee, eggs and bacon. Lunch is often replaced by a quick snack or a sandwich, while dinner is usually the time when people come together and dishes can be influenced by many culinary styles, often connected with the origins of the individual families. In general, however, single-course meat dishes, accompanied by vegetables, potatoes or salad, tend to be preferred.



8.3 Popular dishes and interesting facts

Large amounts of cheese are produced in the USA, often imitating European ones, especially British and Scottish varieties, such as cheddar, a variety of which produced in Wisconsin is particularly popular. It is said that, in the late 1800s, in an attempt to reproduce the famous French *Neufchâtel* cheese (one of the oldest cheeses in France, soft and aged in its mold), William Lawrence of Chester (New York) accidentally developed a method to produce cream cheese with an even richer and creamier consistency than the original, which is currently an ingredient known all over the world, used in both savory and sweet dishes such as cheesecake.

The long coastlines of the USA make fish and seafood easily available: salmon and cod are eaten almost everywhere, while shellfish are typical of local cuisine. Louisiana shrimps are the key ingredient of *shrimp creole*: shrimps cooked with tomatoes, onions, celery, bell peppers and chilies, served on a bed of rice. California crabs are the key ingredient of *Cioppino* fish stew, a dish of Italian-American origin cooked in a tomato sauce with the catch of the day. Finally, Maine mussels and clams are used for the New England *clambake*, a traditional method of steaming over layers of seaweed.

8.4 Environmental impact

Pork is the basic ingredient for making bacon, which is traditionally served for breakfast and/or Sunday brunch, hot dogs, hams and sausages. According to the latest FAO data, farming activities contribute directly to 48% of total greenhouse gas emissions from the agricultural sector in the United States of America, due solely to the intestinal fermentation in pigs and management of the manure produced by them¹².

California is the biggest agricultural producer in the United States of America but the percentage of water uses in this sector is considerable (up to 80%), especially in drought years, which are becoming more frequent due to climate change, making production unsustainable¹³.

¹² FAO. FAOSTAT. (2021). at <http://www.fao.org/faostat/en/#data>

¹³ Mount, J. & Hanak, E. Water Use in California. Public Policy Inst. Calif. (2019). at <https://www.ppic.org/publication/water-use-in-california/>

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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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SDSN MEDITERRANEAN

SDSN Mediterranean is the regional Sustainable Development Solutions Network of the United Nations which promotes the 2030 Agenda and the Sustainable Development Goals (SDGs) throughout the Mediterranean region through research, innovation and new teaching methods and is coordinated by the University of Siena.

The role of SDSN Mediterranean includes many activities, such as: mobilizing the relevant bodies, coordinating the activities of the network, disseminating the regional and global initiatives, also with policy makers, the private sector and NGOs, promoting initiatives that offer regional and global solutions, as well as forging close-knit communities of young academics with a strong awareness of the greatest challenges posed by sustainable development.



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