

## ***Flexitarianism – the sustainable food consumption?***

**Keywords:** flexitarian, omnivore, vegetarian, vegan, plant-based, sustainability, sustainable food consumption

### **1. SUMMARY**

Flexitarians became the largest dietary group after omnivores, they play a significant role when it comes to effectively reducing the consumption of meat and other animal-derived products and thus in fighting climate change.

Looking at all those, who actively reduce or fully exclude at least some animal products, including vegetarians, pescetarians and flexitarians, the group in total represents 30.8% of the population: 10 to 30 % of Europeans no longer consider themselves full meat-eaters anymore. However, there are substantial differences in the proportion of consumers considering themselves and/or categorised as flexitarian. Furthermore, the lack of a definition or at least a wide consensus on what to be considered a flexitarian diet makes it even more difficult to estimate the size of this consumer group.

Why could the classification of flexitarianism still be useful and support a sustainable food consumption? Instead of following strict rules, strengthening consumers' efforts to pursue a more sustainable diet according to their own intention (such as following a flexitarian eating pattern) may be more effective.

Different food consumption patterns are described in this article from omnivores via reducetarians, flexitarians, vegetarians to vegans, where possible definitions and data are provided on the proportion of consumers following such diet patters.

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## **2. Food is a source of nutrients**

Food is a source of vital macro- and micronutrients, vitamins. Foodstuffs, including water are sources of life, necessary and unavoidable for the functioning of our body and to maintain good health. The foods we eat also have influence on the composition of our microbiota. But foods are not only sources of energy, protein, fat and carbohydrates, but they are also a source of enjoyment by providing good taste and smell. Foodstuffs either eaten raw or cooked are part of our social life and our culture.

## **3. Our diet varies**

Our diet varies depending on our geographical location, societal status, economical buying power, our education and cultural background. Mediterranean countries provide a more favourable environment for the production of a wide range of vegetables and fruits allowing a varied diet. Whether and lifestyle have an influence on the gastronomic culture. Seasonality would also influence the availability of foods. Religion, ethical, moral and animal welfare issues motivate consumers, as well. (Jewish, Muslim, Hindu and other religious restrictions not allowing the consumption of pork, beef and certain other types of foods are well-known for a long time.) Some societies are more conservative than others, high level of neophobia would be an obstacle in the acceptance of food innovation and that of novel products. Information, especially the lack of evidence-based information and fake news via social media have a major role in consumers' decisions. On one hand, consumers are becoming more conscious, mainly health-conscious, more and more environment-conscious requesting healthy, 'natural', clean label and sustainably produced foodstuffs to be marketed. On the other hand they follow trends as much as they set up those.

## **4. Planetary Health – the EAT-Lancet Report (2019) [1]**

Food is the single strongest lever to optimize human health and environmental sustainability on Earth. An immense challenge facing humanity is to provide a growing world population with healthy diets from sustainable food systems.

Transformation to healthy diets by 2050 will require substantial dietary shifts. Global consumption of fruits, vegetables, nuts and legumes will have to double, and consumption of foods such as red meat and sugar will have to be reduced by more than 50%. A diet rich in plant-based foods and with fewer animal source foods confers both improved health and environmental benefits. Thus, the EAT-Lancet Report urges a radical transformation of the global food system.

As the goal set up in the EAT-Lancet Report is to achieve „Planetary Health Diets” for nearly 10 billion people by 2050, the Commission would continue its work and publish another report in 2024.

## **5. Different food consumption patterns – Omnivores, vegetarians, flexitarians and anything in between**

The most relevant diets are summarized in **Table 1.** providing different definitions and data for the prevalence and consumption.

Table 1. Eating habits and preferred diets from unrestricted omnivore via flexitarian to vegan  
 (The codes in the table are the ISO codes of the name of the countries - [https://hu.wikipedia.org/wiki/ISO\\_3166-1](https://hu.wikipedia.org/wiki/ISO_3166-1))  
 (The table is continued over 6 pages.)

Preferred diet	Definitions	Proportion of consumers
Unrestricted omnivore	Omnivores with strong dietary preferences for meat and animal-source foods generally.	AU: 46% of meat-eaters (2019) [32]
	'Unrestricted omnivores' are defined as individuals who eat most animal products, including meat, fish, seafood and/or dairy. [6]	AU: 75.6% of meat eaters (2021) [6]
	'High meat consumers' are categorized based on $\geq 86$ g/d meat consumption. [28]	
	Many of today's Western consumers are unwilling to cut their meat consumption. [10]	
	A Finnish study examining meat consumption patterns found a large consumer segment (48 per cent) consisting of respondents who had no intention whatsoever to change their established meat consumption pattern. [29]	FI: 48% (2012) [29]
	A Belgian study identified among its five distinct consumer segments based on meat consumption frequency two segments (representing 41 per cent of the sample) with high levels of meat consumption and unreadiness to shift away from their meat-rich diets. [30]	BE: 41% (2013) [30]
	In a recent Danish study a majority consumer group of 57 per cent were unwilling to reduce their meat intake. [31]	DK: 57% (2021) [31]
	Germany: 44 % of women and 73 % of men were classified as 'high meat consumers' exceeding the maximum recommended daily intake of 86 g meat per day. [28]	DE: 44% f / 73% m (2019) [28]
Omnivore / Omnivorous	An omnivore diet does not exclude any foods or food groups.	World: 73% (2018) [35]
	Omnivore: a typical Western diet including meat and other animal-based foods. [33]  'Regular meat-eaters' eat $\geq 5$ servings/week, occasional meat-eaters eat $< 5$ servings/week. [34]	EU6: 72.3% (2021) [2] ES: 80.5% [2] IT: 79.2% [2] FR: 74.2% [2] UK: 73.7% [2] UK: 75% (82% m / 69% f) [37] AT: 63.4% [2] DE: 62.6% [2]
	North Americans (82%) are significantly more likely to follow an omnivorous diets compared to other regions of the world. [35]	US: 66% (2019) [35]  CH: 93% (2019) [33]
	Serbia (91%), Hungary (91%) and Russia (88%) are the three top meat eating countries. [35]	RS: 91% [35] HU: 91% [35] RU: 88% [35]
	An overwhelming 89% of Australians consider themselves meat eaters. [36]	AU: 89% (2019) [36]
	Only 32% of Indians regularly eat meat, and is the market with the lowest level of meat consumption. [35]	IN: 32% (2018) [35]

Preferred diet	Definitions	Proportion of consumers
Reducetarian	A reducetarian attempts to reduce meat consumption at least one day a week.	AU: 20% (2021) [6]
	A reducetarian, described as a person who is deliberately reducing his or her consumption of meat. [38]	USA: 66% (2018) [39]
Meat reducer	Meat reducers are individuals who are cutting back on meat but are not avoiding meat completely. [6]	NZ: 37% (2018) [46]
	Meat reducers were defined as individuals reporting 'a lot less' or 'slightly less' consumption v. three years ago for one or more of the four meat types examined. [39]	
	In the UK people have reduced meat consumption for a variety of reasons, the most popular being health, weight management, animal welfare and the environment. Health is the number one motivation for those limiting or reducing meat consumption (49%). Weight management is the second most popular reason (29%), followed by concern over animal welfare (24%) and the environment (24%) are equal motivators. [35]	
	'Heavy meat reducers': a meat consumption pattern that included 1-3 times meat per month on average. 'Moderate meat reducers': on average, eat weekly two times a meal with meat. 'Light meat reducers': maintain the lowest level of meat restriction, eating meat for at least 4 days/week, on average. [6]	
Flexitarians are also referred to as 'meat reducers'	The meat consumption frequency of meat reducers (i.e. flexitarians) is in-between that of omnivores and meat avoiders (i.e. vegetarians and vegans). [40]	
	39 and 32% of Americans, respectively, said they ate less meat than they did three years earlier in 2012 and 2015. [41], [42]	USA: 39% USA: 32%
	In a 2014 survey by FGI Research, 16 % of Americans stated they had cut back on meat in the past year. [43]	USA: 16% (2014) [43]
	14 per cent and 11 per cent in the samples of adult Canadians were assigned to the group of meat reducers, who reported having already made conscious efforts to reduce their meat intake, and were motivated by health, ethical and environmental reasons to further change their diet. [44], [45]	CN: 14% (2019) [44] CN: 11% (2020) [45]
	Meat reducers' attitudes towards healthy and natural food products were found to be more positive than omnivores' attitudes but less positive than vegetarians' attitudes. [78]	
	'Low-meat consumers' are defined as people who do not exceed the maximum meat intake officially recommended by national dietary guidelines. [28]	
	The practice of making a conscious effort to reduce meat consumption largely for environmental reasons, is called „demitarianism”. [17]	

Preferred diet	Definitions	Proportion of consumers
Flexitarian  Flexitarians, consumers reducing their consumption of meat are also referred to as 'meat reducers', 'low meat-eaters' or 'semi-vegetarians'.	Flexitarians deliberately aim to reduce animal products in their diet, but do not strictly exclude any food group.	World: 14% (2018) [35]
	Following a flexitarian diet highlights an increased intake of plant-based meals without completely eliminating meat. It is about adding new foods to your diet as opposed to excluding any, which can be extremely beneficial for health. These plant-based foods include lentils, beans, peas, nuts and seeds, all excellent sources of protein.	EU6: 18.3% (2021) [2] DE: 27.3% [2] DE: 11.6% (2013) [53] AT: 25.8% [2] FR: 18.8% [2] ES: 13.1% [2] GB: 12.9% [2] IT: 12.1% [2]
	Flexitarians choose less or without meat meals if they were available. [47]	
	Less Meat, More Plants. Go meat-free any day of the week by adopting a flexitarian diet. [48]	UK: 11% [37]
	A predominantly plant-based diet complemented with modest amounts of animal foods (meat, dairy, fish). [10]	AU: 18.9% (2021) [54]
	The flexitarian diet can be generally defined as a semi-vegetarian, plant-forward diet that incorporates dairy and eggs and allows room for meat from time to time. [8] Moreover, the flexitarian diet is a flexible eating style that emphasizes the addition of plant or plant-based foods and beverages, incorporates dairy and eggs and encourages meat to be consumed less frequently and/or in smaller portions. The Flexitarian diet is a style of eating that encourages eating mostly plant-based foods while allowing meat and other animal products in moderation. It's more flexible than fully vegetarian or vegan diets. [49]	
	Flexitarians are also known as flexible vegetarians, casual vegetarians or vegivores. [48]	
	A food consumption pattern in which meat is eaten occasionally without avoiding it completely. [10]	
	Becoming a flexitarian is about adding five food groups to your diet – not taking any away. These are: the „new meat” (non-meat proteins like beans, peas or eggs); fruits and veggies; whole grains; dairy; and seasonings. [50]	
	Half of flexitarians consume meat $\geq 4$ days/week, on average. [51]	
	Flexitarians: the growth segment with the highest potential: they want to cut their meat and dairy intake: estimated at 10 to 30 % of Europeans today, the flexitarian is a profile that is hard to pinpoint exactly, also differing within given EU countries. [11]	EUR: 10-30% (2020) [11]
	Peru (27%), Malaysia (25%) and Chile (22%) have the highest percentage of flexitarians. [35]	PE: 27% [35] MY: 25% [35] CL: 22% [35]
	'Heavy flexitarians': classification based on a self-reported weekly meat consumption frequency of 1 or 2 times per week meat for dinner. 'Medium flexitarians': half of the week a meatless dinner. 'Light flexitarians': based on a meat frequency of 5 or 6 times per week meat for dinner. [10]	
	In comparison to 2011, when only 13 per cent of the Dutch meat-eating consumers identified themselves as flexitarian, this percentage rose substantially to almost 43 per cent in 2019. These are paradoxical results of a rising flexitarian self-identification in combination with high and stable levels of self-reported number of days in which meat is eaten. [10], [52]	NL: 43% (2019) NL: 13% (2011)

Preferred diet	Definitions	Proportion of consumers
Pescetarian or Pesco-vegetarian	<p>The pescetarians (also known as pescatarians) consume fish, dairy foods, and eggs but not other kinds of meat. [47]</p> <p>Middle East &amp; Africa are more likely to be pescetarian (5%) compared to other regions of the world. [35]</p> <p>Peru and Turkey have the highest number of pescatarians. However, it is still only the 4<sup>th</sup> most popular diet in these markets. [35]</p>	<p>World (2018) [35]</p> <p>EU6: 2.9% (2021) [2]            GB: 4.6%            AT: 4.5%            DE: 3.4%            IT: 2.3%            ES: 2.1%            FR: 0.7%</p> <p>CH: 2.9% (2019) [33]</p> <p>PE: 8% [35]            TR: 8% [35]</p>
Pesce-pollotarian	Pesce-pollotarians eat some fish and other seafood as part of their semi-vegetarian meals. [55]	
Pollotarian	<p>A pollotarian is someone who eats poultry but not red meat or pork products.</p> <p>Pollotarianism is the practice of adhering to a diet that incorporates poultry as the only source of meat in an otherwise vegetarian diet. While pollo specifically means chicken in both Spanish and in Italian, pollotarians are known to incorporate different forms of poultry, like duck and turkey in their diet. [56]            Pollotarians may also eat dairy products.</p> <p>A pollotarian (aka a pollovegetarian or a pollo-vegetarian) is someone who will not eat the flesh of any red meat mammals, but does include chicken, turkey and other poultry. They may or may not also exclude fish, seafood or products like eggs and dairy from their diet. Can also be a stepping stone to vegetarianism as the individual restricts their meat-intake &amp; slowly over a period of time cuts all meat forms out. [57]</p> <p>A plant-based diet that is semi-vegetarian because it exempts the consumption of poultry including duck and turkey is termed as a pollotarian diet. Followers of the diet avoid red meat and pork products, while there are a few people who allow eggs and dairy products in their diet. [55]</p>	

Preferred diet	Definitions	Proportion of consumers
Vegetarian	Vegetarians do not eat meat products.	World: 5% (2018) [35]
(incl. Ovo-Lacto-Ovo-lacto-Pesco-vegetarians)	Vegetarians are individuals who do not eat meat but may eat other animal products. [6]	EU6: 4.1% (2021) [2] UK: 5.6% [2] UK: 5-7% (2022) [37] DE: 4.6% [2] DE: 1.6% (2006) [69] DE: 3.7% (2013) DE: 4.3%: 6.1% f / 2.5% m (2016) [70] DE: 10% (2018) [71] FR: 4.3% [2] IT: 4.1% [2] IT: 5.4% (2022) [63] AT: 4.1% [2] ES: 2.1% [2]
	A vegetarian diet is commonly defined as one that excludes both red and white meat, including fish and seafood. [58] However, many self-defined vegetarians still consume red or white meat products, as well as fish or seafood. [59], [60], [61], [62]	
	Vegetarian foods exclude meat and fish, but may include ingredients like dairy, eggs, and honey. A vegetarian diet includes animal-based ingredients but no meat. Therefore, eggs, dairy and honey may be included whereas meat and fish are excluded.	
	In the UK, the 2021 youGov survey (YouGov Food Study) found that 5-7% of Brits now identify as vegetarian. [37]	
	Share of vegetarian and vegan individuals in Italy in 2022 is 5.4%. From 2014 to 2022, the share of vegetarian people in Italy showed some fluctuations. According to the survey, 6.5 percent of respondents declared to be vegetarian in 2014. Whereas, this value went down to 5.4 percent in 2022. On the other hand, the share of Italian vegan individuals more than doubled during this period. [63]	
	In Sweden one in ten consumers is vegan or vegetarian. In the poll conducted by Demoskop, 6 percent of respondents said they were vegetarians, while 4 percent said they were vegans. [64]	SE: 6% [64]
	1.1% of Hungarians are vegetarian. [65]	HU: 1.1% (2021) [65] CH: 3.6% (2019) [33] TR: 3% (2022) [72]
	According to Harris Poll conducted in 2019 within the US on behalf of The Vegetarian Resource Group, 4 percent of the Americans are vegetarians, from which 2 percent are vegans. [66]	USA: 4% (2019) [66]
	In Brazil (BR), 14 percent of the population declares vegetarian, according to a survey by IBOPE Inteligencia conducted in April 2018. [67]	BR: 14% (2018) [67]
	12% of the population of Argentina (AR) is vegetarian or vegan. [68]	AR: 12% (2019) [68] AU: 4% (2021) [6] AU: 3% (2019) [36]
	India (IN) has a significantly higher levels of vegetarian and vegan diets. India is the market which is most different to all other markets. 22% follow a vegetarian diet (second most common diet in India). Vegetarianism is strongly linked with the number of practicing religions in India – especially Jainism. [73]	IN: 22% (2018) [73]



Preferred diet	Definitions	Proportion of consumers
Vegan	Vegans do not eat animal products.	World: 3% (2018) [35]
	A vegan diet excludes all animal products. [74] Vegans avoid meat, fish, eggs, dairy, and all other animal-derived food products. [49]	Europa: 4% (2019) [77] EU6: 2.3% (2021) [2] GB: 3.2% IT: 2.3% IT: 1.3% (2022) [63] DE: 2.2% AT: 2.2% ES: 2.1% FR: 2.0%
	Vegan products do not contain any animal-based ingredients, such as meat, fish, dairy, eggs and honey. The production process must not use animal-derived products either, such as gelatine for clarifying juice or wine, or animal-based glue for product packaging. Vegans refrain from including any animal based products in their diet, thus excluding meat, fish, dairy, eggs, honey, etc. Their diet may consist of plant foods and processed foods that purely contain plant-based ingredients.	
	It should be noted that a vegan diet is distinguished from veganism. A vegan diet [75] refers to a food practice, whereas veganism is a philosophy, a lifestyle, and a political movement that rejects, for moral reasons, the use of animals for human gain. Therefore, veganism eliminates as far as practicable and possible, all forms of exploitation of non-human animals for food, clothing, cosmetics and drugs, entertainment or any other purpose [76] and, by extension, suggests the consumption of products that are animal-friendly.	CH: 0.4% (2019) [33] TR: 2.0% (2022) [72] USA: 2% (2019) [66] USA: 5% (2020) [77]
	Veganism is defined as a way of living that attempts to exclude all forms of animal exploitation and cruelty, whether for food, clothing, or any other purpose.	
	There are different varieties of the vegan diet. The most common include „whole food vegan diet” (this diet is based on a wide variety of whole plant foods such as fruits, vegetables, whole grains, legumes, nuts, and seeds); „raw food vegan diet” (it is based on raw fruits, vegetables, nuts, seeds, or plant foods cooked at temperatures below 48°C); „80/10/10 diet”; „starch solution”; „raw till 4”; „junk food vegan diet” and so. Although several variations of the vegan diet exist, most scientific research rarely differentiates between different types of vegan diets. [49]	Asia: 13% (2019) [77]
	Australia is another country with only 1% of the population to identify themselves as vegan, according to the ABC’s Australia Talks National Survey. [36]	AU: 1.7% (2021) [6] AU: 1% (2019)
	India is the market which is most different to all other markets. 22% follow a vegetarian diet (second most common diet in India), and 19% are vegan. [35]	IN: 19% [35]

Varied diets – unless restricted by environmental, economic and social-cultural factors – allow the moral, ethical and spiritual approach of people being reflected.

We are mainly **omnivores** in Europe (72.3% based on a survey conducted in 2021 in six EU Member States) [2], such as North Americans (66% in 2019) [3], regularly consuming meats (pork, beef, mutton, goat, chicken and other poultry), but mainly red meat. An omnivore diet does not exclude any foods or food groups, unless the given consumer has food allergy, intolerance or other food-related health issue.

A small proportion of consumers are **vegetarians** (ovo-, lacto or ovo-lacto vegetarians) or **vegans** but they strictly follow their choice of diet, they are persistent and consistent in their decision to follow a meat-free, plant-based (e.g. vegetables, fruits, legumes, cereals etc.) diet. On average, 4.6% of Europeans are vegetarians, but it varies, 5-7% in the United Kingdom, 4.6% in Germany, 4.1 in Italy and Austria, 4.0% in AUT, 3.6% in Switzerland and as low as 2.1% in Estonia (see **Table 1.**), to name a few.

Vegans, who follow a more strict diet by excluding all meat, dairy, eggs and honey (all meat-based ingredients), form a small group of people. Data on the proportion of vegans in different countries are provided in **Table 1.** The production process must not use animal-derived products either, such as gelatine for clarifying juice or wine, or animal-based glue for product packaging.

Do we need definitions for vegetarian and vegan diets at all? Maybe not. However, in case food business operators (food processors and retailers) are willing to label foods as being suitable for vegetarian and vegan consumers, for example as „vegan food”, than we have to have a clear definition in order to be able to control the labelling. Furthermore, it would be useful to have an (and only one) internationally used, clear and harmonised logo for vegan foods. A symbol for labelling vegan and vegetarian products and services called „V-Label” exists. It was registered in 1996. [4]



Until today, there is no official definition for vegetarian and vegan diets. Despite the very detailed and comprehensive EU food legislation, there is no definition for vegetarianism and veganism, thus labelling rules for suitable food products have not been set up. In 2019, the European Commission (EC) began to define the concept of vegetarian and vegan food following the authorization given by a law passed in 2011. The EU Food Information Regulation stipulated that the EC is to issue an implementing act defining requirements for “information related to suitability of a food for vegetarians or vegans” (Article 36(3)(b) Regulation (EU) No 1169/2011). The European Vegetarian Organization (EVU is the umbrella organisation of vegan and vegetarian associations and societies throughout Europe, „representing plant-based interests in the EU”, as they claim) together with FoodDrinkEurope (FDE is a food industry confederation in the European Union), have prepared proposals [5] for possible names. They point out, that the Commission has failed to act upon this responsibility since 2011 and does not consider the matter to be of high priority.

The proposed definition for food suitable for **vegans** is as follows: „Foods that are not products of animal origin and in which, at no stage of production and processing, use has been made of or the food has been supplemented with - ingredients (including additives, carriers, flavourings and enzymes), or - processing aids, or - substances which are not food additives but are used in the same way and with the same purpose as processing aids, that are of animal origin.

### **5.1. Vegetarian foods**

Foods are belonging to this group, which are meet the requirements of vegan foods, with the difference that in their production and processing milk and dairy products, colostrum, eggs, honey, beeswax, propolis, or wool grease (including lanolin derived from the wool of living sheep or their components or derivatives) may be added or used.

Dedicated vegans usually start as vegetarians. According to the VeganZ study [2] conducted in six EU member states, 67.3% of vegans reported initially being vegetarian. In addition, 83% of vegetarians (FR) can imagine only buying plant-based products. As such, one can expect a proportion of vegetarian study participants to not only give up eating meat and fish in the future, but also to give up all animal-derived products. So, it is interesting to note that there is a trend towards veganism among vegetarians.

Besides that, 12.1% of omnivores are not opposed to a vegan diet, while 28.2% can imagine going vegetarian.

There are numerous variations between the omnivore and the vegan diets, such as – including but not limited to – reducetarian, flexitarian, semi-vegetarian, pescetarian (who exclude (red) meat from their diet, but eat fish), pesce-pollotarian, pollotarian diets, not to mention the ovo-, lacto- and ovo-lacto-vegetarian eating habits (Table 1.).

## **6. The flexitarian diet**

### **6.1. Flexitarians**

Consumers who are reducing their consumption of meat are also referred to in the literature as 'meat reducers', 'low meat-eaters' or 'semi-vegetarians'. [6]

Flexitarians deliberately aim to reduce animal products in their diet, but do not strictly exclude any meat. Flexitarian is a marriage of two words: flexible and vegetarian. The term was coined more than a decade ago by D. J. Blatner in her 2009 book “The Flexitarian Years to Your Life.” Blatner says you don't have to eliminate meat completely to reap the health benefits associated with vegetarianism – you can be a vegetarian most of the time, but still enjoy a burger or steak when the urge hits. By eating more plants and less meat, it's suggested that people who follow the diet will not only lose weight but can improve their overall health, lowering their rate of heart disease, diabetes and cancer, and live longer as a result.

According to the German Society for Nutrition, you can also call „flexitarians” „flexible vegetarians”. Even though they consume meat and fish, they do it less frequently than traditional omnivores. [7] Flexitarians are also known as casual vegetarians or vegivores. The flexitarian diet can be generally defined as a semi-vegetarian, plant-forward diet. It is a flexible eating style that emphasizes the addition of plant or plant-based foods and encourages meat to be consumed less frequently and/or in smaller portions.

Flexitarians, consumers reducing their consumption of meat are also referred to as „meat reducers” or „low meat-eaters”.

As the terms flexitarian and semi-vegetarian (even called earlier as partial- and pseudo-vegetarian) are often used as synonyms, neither vegetarian nor flexitarian have definitions, so it is rather difficult to compare these groups and to study their proportion. So in order to clearly differentiate them, they are arranged in **Table 2.** according to their attitude towards and consumption of meat.

Table 2. Consumption of certain food groups in different types of diets – with special regard to meat consumption

Type of diet		Meat	Poultry	Fish & Seafood	Any other animals	Dairy	Eggs	Plants
Omnivore	Unrestricted omnivore	Yes daily	Yes	Yes	Yes	Yes	Yes	Yes
	Omnivore	Yes 5-6 times a week	Yes	Yes	Yes	Yes	Yes	Yes
Flexitarian		Yes reduced	Yes reduced	Yes reduced	Yes reduced	Yes	Yes	Yes
Vegetarian	Pollotarian	No	Yes	No	No	Maybe	Yes	Yes
	Pesce-pollotarian	No	Yes	Yes	No	Maybe	Maybe	Yes
	Pescetarian	No	No	Yes	No	Maybe	Maybe	Maybe
Vegetarian	Lacto-ovo vegetarian	No	No	No	No	Yes	Yes	Yes
	Ovo vegetarian	No	No	No	No	No	Yes	Yes
	Lacto vegetarian	No	No	No	No	Yes	No	Yes
Vegan		No	No	No	No	No	No	Yes

Calories in the flexitarian diet mostly come from nutrient-rich foods such as fruits, legumes, whole grains and vegetables. When it comes to protein, plant-based foods (e.g., soy foods, legumes, nuts and seeds) are the primary source. Protein also comes from eggs and dairy, with lesser amounts coming from meat, especially red and processed meats. Due to the emphasis on nutrient-dense foods, the flexitarian diet encourages limiting one's intake of saturated fat, added sugars and sodium.[8] Whether the latter is true or not, could be further studied. Following a flexitarian diet might not necessarily ensure a healthier nutrition, than that of omnivores. The interpretation of the term flexitarian is so diverse and its composition might differ so much, that we should be aware of the type of the food of animal origin and the frequency of its consumption to be able to judge.

The term flexitarian has been criticized by some vegetarians and vegans as an oxymoron because people following the diet are not vegetarians but omnivores as they still consume the flesh of animals. [9]

As there is no consensus regarding the definition of flexitarianism, it is rather difficult to measure or estimate the number and proportion of flexitarian consumers. Some consumers think of themselves as flexitarian when they cut meat consumption by half, only for one day, reduce it to 4 days/week, or even less. This discrepancy might have led to the following classification: „heavy flexitarian” (1 or 2 times per week meat for dinner), „medium flexitarian” (half of the week a meatless dinner) and „light flexitarian” (meat consumption frequency 5 or 6 times per week) [10]. This classification helps to overcome the huge differences in the interpretation of the term „flexitarian”.

Whether the classification of flexitarian consumers is based on a self-reported weekly meat consumption frequency or based on the measurement of the food consumption pattern by other means, it may lead to very different data. So we have to handle data on the proportion of flexitarians by care.

Even if the number of vegans and vegetarians has risen, most of the population is still consuming meat and other products of animal origin: on average 18.3% of Europeans consider themselves flexitarians. Their number is higher in Germany (27.3%) and Austria (25.8%) and lower in Spain (13.1%) and in Italy (12.1%). [2] (See Table 1. for more data.)

More than 50% of non-vegans in Germany intend to reduce their consumption of animal-derived products in the future. [2]

15.3% of flexitarians can imagine going vegan, while 54.8% would switch to a vegetarian diet.

Looking at all those, who actively reduce or fully exclude at least some animal products, including vegetarians, pescetarians and flexitarians, the group in total represents 30.8% of the population: 10 to 30 % of Europeans no longer consider themselves full meat-eaters anymore. [11]

## 7. Environmental concerns – plant-based solutions

In contrast to vegans and vegetarians, flexitarians attribute their main reasons for reduced meat consumption to the environment and sustainability (72.1%). [2]

Some authors [12, 13, 14] refer explicitly to a flexitarian diet as an important dietary change that significantly contributes to reducing the environmental footprint of the food system and providing more healthy eating patterns and nutritional benefits to food consumers. These studies define a flexitarian dietary pattern as predominantly **plant-based** complemented with modest amounts of animal foods (meat, dairy, fish). [10]

More and more people in Europe choose plant-based products over animal-based nutrition, occasionally or permanently. Almost all big supermarket chains list veggie meat and dairy alternatives.

Flexitarianism or ‘casual vegetarianism’ is an increasingly popular, plant-based diet that claims to reduce your carbon footprint and improve your health with an eating regime that’s mostly vegetarian yet still allows for the occasional meat dish. The rise of the flexitarian diet is a result of people taking a more environmentally sustainable approach to what they eat by reducing their meat consumption in exchange for alternative protein sources. [15]

Reducing meat and dairy consumption could cut greenhouse gas emissions by between 0.7-8 billion tons of CO<sub>2</sub>eq annually by 2050 – that’s roughly between 1 percent and 16 percent of current emissions. But the Intergovernmental Panel on Climate Change (IPCC) is clear that in many poorer societies, it’s hard to find alternatives to animal protein. The EU has avoided policy that encourages citizens to cut meat eating, fearing political backlash. [16]

Another term should be mentioned here: „demitarian diet“. „Demitarianism“ is the practice of making a conscious effort to reduce meat consumption largely for environmental reasons. The term was devised in 2009 in Barsac (France) at a workshop of environmental agencies, where they developed “The Barsac Declaration: Environmental Sustainability and the Demitarian Diet”. [17]

## 8. Plant-based diets

As there is an increasing need for alternative proteins, **plant-based diets** are gaining momentum. Plant-based diets have been praised for their benefit to our health and the environment. There is neither an official definition nor consensus on what defines a plant-based diet. It is used to describe a variety of dietary patterns, from the Mediterranean diet to Vegetarian and Vegan diets. The descriptions of plant-based diets mainly focus on the promotion of healthy plant foods, such as fruits, vegetables, bean, pulses, nuts etc., and they do not necessarily exclude the consumption of meat and dairy products, so these are not expecting the total avoidance of products of animal origin. [18, 19]

Although a plant-based diet is often used to describe a plant-only or vegan diet, it is not about the complete avoidance of animal products. Plant-based diets should be thought of as plant-forward diets or ‘flexitarian’ approaches, which emphasise eating healthy plant foods. While meat and dairy products are not necessarily avoided altogether, the frequency and portions that they are consumed will be reduced and most of the nutrients should come from healthy plant foods.

According to a Harvard Business Review [20] flexitarian consumers are the biggest market for plant-based products (accounting for 70% of sales in some categories [21], and 30% of overall shoppers [22]).

## 9. Food and Health

As mentioned before, in contrast to vegans and vegetarians, flexitarians attribute their main reasons for reduced meat consumption to the environment and sustainability. However, there are also health reasons and societal concerns pushing consumers to change their dietary habits. The health issues, the high prevalence of Non-Communicable Diseases (NCDs) is well-known. Whether it is hidden hunger, obesity or CVDs, tumors or other health issues in relation to food consumption, the non-balanced diet has long-term consequences. Short term changes, such as following fashion-diets are not appropriate in case we wanted to avoid the negative health consequences of our diet.

Consumers are becoming increasingly aware of the relationship between **food and health** and are changing their purchasing behaviour accordingly.

79% of Belgian respondents (n=17.000 (2021)) actively seek information on healthy living, and they expect regulators to play a stronger role in promoting health and environmental sustainability. BE consumers eat more fruit (51%) and vegetables (57%) than previously. [23]

## 10. Societal problems

The importance of societal problems – besides of health-related and environmental issues – should also be emphasized, as the increasing amount of non-evidence-based information spread most efficiently via social media and by bloggers and other influencers would undermine the reliability and trustfulness of science and its golden rules.

Another phenomenon is, when dogmas are being built. Numerous food-related dogmas were built in the last decades. These also endanger trust.

Consumers may also lose their trust in the food system due to greenwashing and similar attempts. When food companies are aiming to overdo and mimic environmental-friendly practices, consumers become most disappointed when the reality becomes evident.

## 11. Trend or fad?

An increasing group of food consumers are purposefully reducing their meat intake, without totally eliminating meat from their diet. They have no intention to become vegetarian or vegan, but for health and environmental reasons they are flexible and reduce their meat consumption.

The demand for vegan and vegetarian food products including alternatives to meat, milk, or eggs, has expanded considerably during recent years in Europe. [24]

Being a high-flying trend, a major innovation in the current decade, but will plant-based meat analogues continue to rise and generate enormous income for investors and for the time being, or is it going to be a fad?

„It is unlikely that plant-based meat will continue to grow as rapidly as it has the past few years. While it is certainly not a short-term fad, steep growth-rates will certainly cool down before 2025.“ [25]

It was found that the percentage of heavy flexitarians (see definitions in Table 1. and above) decreased from more than 15 per cent in 2011 to less than 10 per cent in 2019, while the percentage of light flexitarians increased from 36 per cent in 2011 to 41 per cent in a Dutch survey. Such figures contribute to a slightly higher average in the number of days in which meat was eaten at dinner: from 4.6 days a week (2011) to 4.8 days a week (2019). And this outcome could be reconciled with the fact that per capita meat consumption in the Netherlands has been stable between 2011 and 2019 at approximately 39 kg. All this suggests that flexitarianism has made little progress in the past 10 years – at least, when it comes to overt behaviour. [10]

## 12. Generational differences

A recent US survey [26] examined the food priorities and buying power of Generation Z, how more Americans are concerned about environmental sustainability. The 17<sup>th</sup> annual 2022 Food & Health Survey, conducted online (n=1,005, ages 18 to 80) oversampled Gen Z consumers (ages 18-24), who showed strong interest in the environment. When asked whether they believed their generation was more concerned about the environmental impacts of their food choices than other generations, Gen Z was the most likely to say yes at 73%, followed by millennials at 71%. Among all age groups, 39% said environmental sustainability had an impact on their purchasing decisions for foods and beverages, which was up from 27% in 2019.

## 13. Sustainable diets

The United Nations Food and Agriculture Organization (FAO) defines sustainable diets as having a low environmental impact, while meeting current nutritional guidelines, all while remaining affordable, accessible and culturally acceptable. [27]

Cultural and historical background, gastronomy, consumer habits and the role food plays in our culture have an immense effect on the way how and what we eat.

Consumer habits are rather difficult to change. Besides, it is widely known, that there can be large discrepancies between consumers' self-perception and their actual behaviour, for example between the number of self-declared flexitarians and their actual meat consumption (frequency).

Despite all scientific evidence and scholarly consensus about what a healthy and sustainable dietary pattern consists of, in current practice mostly only small minorities of food consumers turn out to be able to meet such dietary recommendations. This indicates clearly that it must be expected that moving to a flexitarian diet style in which meat intake is limited to some degree is considered a dramatic dietary shift to many people. This implies that irrespective of the consensus about what a sustainable diet generally is, it is much less clear and uncontroversial how willing and helpful consumers could be to drive the transition to meat-restricted diets and dishes. [10]

Throughout human history, consumers abstained from eating meat on a regular basis, even if it was not a question of buying power or poverty, but a religious reason (see „Friday Fish” or „meat-free-Fridays”) or others.

We should not underestimate the role of meat in our diet, its sensory and nutritional value, its role in the national cuisine (see the examples of Germany, Switzerland and Hungary), how it is associated with wealth and power, traditional foods and tradition which might be an obstacle to innovation and novelty. The role animal husbandry plays in the economy, mainly in agricultural countries and numerous other factors would influence the way we relate to foods.

In case we will have a growing interest and commitment to increase our vegetable and fruit consumption, to reduce the meat intake than, with or without plant-based meat analogues, we may achieve healthier life for ourselves and for our fellow human beings.

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