

## Research Article

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**Abbreviations:**

UK, United Kingdom; FR, France; GHG, greenhouse gas emissions; USA, United States of America; FG, focus group; II, individual interview

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# A qualitative study to explore and identify reasons for dairy consumption and non-consumption among young adults (18–30 years old) in the UK and France

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**Abstract**

The aim of this study was to explore and identify why young adults aged between 18 and 30 years in the UK and France do or do not consume dairy products. Several studies have associated dairy products with a healthy diet, and the production of soft dairy, i.e. milk, yoghurt, and soft cheese, as more environmentally friendly than some other animal-based products. Yet recent reports highlight that dairy intake is lower than recommended for health, especially among young adults. Using a qualitative methodology, forty-five participants aged 18–30 years (UK: n = 22; France: n = 23) were asked about their reasons for (non)consumption of a wide range of dairy products. Audio-recorded focus groups and individual interviews were conducted in English in the UK and in French in France, transcribed and coded. A thematic analysis found four themes and sixteen sub-themes (*theme* product-related: *sub-themes* sensory, non-sensory, composition; *theme* individual-related: *sub-themes* mode of consumption, preferences, personal reasons, knowledge, attitudes and concerns, needs or cravings; *theme* cultural aspects: *sub-themes* product categorization, social norms, use; *theme* market offering: *sub-themes* alternative, packaging, value for money, availability) to influence participants' dairy (non)consumption in both countries. A seventeenth sub-theme (*theme* cultural aspects: *sub-theme* structure of the meal) was found to influence dairy consumption only in France. Further studies are needed to investigate these themes within larger samples, but these findings contribute to understanding dairy (non)consumption in young adults in the UK and France and may aid the development of strategies to improve young adults' diets.

**Introduction**

Dairy is a wide category of food that includes products differing in taste, appearance, smell, texture, and the manner in which they are consumed (their mode of consumption).<sup>(1,2)</sup> These products provide bioactive compounds, calcium, and other micronutrients that help maintain a healthy diet.<sup>(3,4)</sup> The consumption of dairy is beneficial during all life stages to optimize bone density, maintain gut health, and reduce the risk of developing other non-communicable diseases.<sup>(3–11)</sup>

Preferring dairy to other animal-based products has also been associated with more sustainable diets from nutritional, environmental, societal, and economic perspectives, as given in the definition of sustainability from the Food and Agriculture Organization of the United Nations.<sup>(12)</sup> Moreover, a recent paper shows that by reducing meat consumption in favour of more dairy, particularly soft dairy, people may be able to engage in sustainable actions and lower carbon lifestyles.<sup>(13)</sup> Soft dairy refers to milk, yoghurt, fermented products, and unripened soft cheese.<sup>(1)</sup> Its consumption has been associated with healthier, low cost, and more environmentally friendly diets.<sup>(14–22)</sup>

Despite national dietary guidelines around the world advising the consumption of dairy every day,<sup>(23)</sup> in several countries, dairy intakes are reported to be lower than recommended.<sup>(24–27)</sup> In 2021, the European Dairy Association reported underconsumption of dairy in 18 out of 23 countries,<sup>(28)</sup> e.g. in France, the average consumption of milk was at the time about 75 ml/day, while the daily recommendation was 300 ml.<sup>(28)</sup> Moreover, recommended intakes in global dietary guidelines are not harmonized, with different countries suggesting differing amounts.<sup>(19,24,28,29)</sup> For instance, in France the recommended daily intake of dairy is 2 servings, where the portion size is 150 g of milk, 125 g of yoghurt, or 30 g of cheese, while the British dietary guidelines provide an upper limit based on energy intake, advising consumers not to exceed 8% of total daily caloric intake through dairy intake.<sup>(28)</sup> Alongside this, dairy products

such as fermented dairy or cultured milk are rarely included in recommended dietary intakes despite their positive contributions to health.<sup>(19)</sup>

While low dairy intakes are of concern for all ages of the population, consumption strongly decreases after adolescence and the school years.<sup>(25,28,30)</sup> Young individuals aged between 18 and 30 years old typically have poor dietary habits, e.g. low fruit and vegetable intake.<sup>(31,32)</sup> Young adulthood is a stage of life that is crucial in the development of new habits that will impact the future health of individuals,<sup>(33–36)</sup> but young adults tend to have limited awareness and knowledge concerning dietary topics, including the benefits of dairy intake.<sup>(37,38)</sup> Personal negative experiences, such as discomfort and digestive issues following dairy intake,<sup>(37,39)</sup> and/or misconceptions or personal beliefs, e.g. an association between dairy consumption and acne,<sup>(40)</sup> may lead to non-consumption of this category of foods, and even where nutritional literacy is increased through intervention, dairy intake can remain low.<sup>(41)</sup>

Many facilitators and barriers have been found to influence healthy eating, including dairy consumption, in different populations and different countries.<sup>(42–46)</sup> These barriers and facilitators may be personal, e.g. preferences, socio-economic position; or external to the individual, e.g. availability, food culture.<sup>(2,29,33,47)</sup> Furthermore, the same factors may assume different roles and impact positively or negatively on dairy consumption and can act as barriers or facilitators based on the target population.<sup>(37)</sup> These factors were also found to influence consumption across cultures.<sup>(37,39,48)</sup> Culture and familiarity with products can affect food choices through a role in attitude formation, such as in creating food taboos or reinforcing societal meal habits.<sup>(49–54)</sup> Even now, with many non-traditional food products available due to globalization, traditions and customs still shape the majority of dietary patterns in Europe,<sup>(50)</sup> including dairy consumption.<sup>(54)</sup> Consumers living in different countries indeed show different eating patterns, including dairy consumption, due to different histories, educations, or market policies,<sup>(55)</sup> and these factors may also have a role as barriers or facilitators to consumption.<sup>(55–57)</sup>

While many reasons for consumption and non-consumption are known, however, most studies in the literature tend to focus on one product only (e.g. cow's milk) or one product category (e.g. yoghurt), while avoiding comparisons between different products and product categories. Investigating the barriers and facilitators for a range of dairy foods and product categories across more than one culture would add depth to our understanding of dairy consumption. Considering the important role that dairy may assume in healthy and more sustainable diets, this study aimed to explore the reasons for (non)consumption of a wide list of dairy products among young adults aged between 18 and 30 years living in different countries. Identifying barriers, facilitators, and motivations for consumption is an important aspect to consider when developing strategies to promote higher dairy intake among the target population.

## Materials and methods

This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving human participants were approved by the Research Ethics Committee of Bournemouth University, UK (ID: 43726). Written informed consent was obtained from all participants. Data were collected in Bournemouth, UK, and in Ecully, Lyon, France, in collaboration with the Institut Paul Bocuse Research Center, now known as the

Institut Lyfe Research Center, in Ecully, Lyon, France. The UK and France were chosen for comparison considering that both countries are in the top 15 milk-producing countries in the world,<sup>(58)</sup> and have a homogeneous national food culture, with few differences between regions.<sup>(59)</sup> However, the most commonly consumed dairy foods in the two countries are different: cow's milk and hard cheese are most commonly consumed in the UK<sup>(28,58)</sup>; in France, cow and non-cattle dairy, i.e. goat's and sheep's dairy, are most commonly consumed as milk, yoghurt, cottage cheese, and soft cheeses.<sup>(28,59,60)</sup>

## Participants

Young adults aged 18–30 years old were recruited through social media, flyers, community groups, and snowball sampling to participate in either in-person focus groups or in-person individual interviews. To be eligible, they were required to live in the country where the focus group or individual interview took place, speak the country's language fluently, and not follow a vegan diet. Before the interview, they received, by email, a participant information sheet, completed a demographics questionnaire, and signed a consent form. No participants were admitted to the study without signing this form. In the demographic questionnaire, participants were asked for details about their age, gender, employment, level of education, the city in which they lived at the time and if they were following a specific diet (i.e. vegetarian, vegan, pescatarian, ovo-vegetarian, lacto-vegetarian, and flexitarian). These details were collected to confirm select inclusion criteria (as above) and further describe the study sample. Participants were able to withdraw from the study at any time before or during the study but not after the end of their focus group or interview, as all data collected were anonymized during transcription, stored confidentially, and made available only to researchers related to the study. Each participant was given an identification code based on the country in which they were taking part in the study, the method of assessment, i.e. focus group or individual interview, and a number, e.g. UKFG1P1. Students at Bournemouth University taking part in the study were compensated with course credits. Due to recruitment limitations and to reach an adequate number of participants in both countries, young adults taking part in the study at a late stage received a gift voucher as compensation for their time. All participants were recruited following the same scheme, with no reference to reimbursement.

## Focus group and individual interviews

Each participant took part in one focus group or individual interview. While focus groups are a good method to collect data from a range of different people and allow for varied discussion and interactions, individual interviews are also useful for understanding a single person's point of view<sup>(61)</sup> and discussing topics that people may not feel comfortable sharing in a group.<sup>(62)</sup>

Semi-structured focus groups and individual interviews were conducted in both countries, in the country's native language by the same moderator. Participants taking part in focus groups had the opportunity to choose to attend a group of only their own gender or a group of mixed gender. When participants were not available to take part in a focus group, they were invited to take part in an individual interview at a time/day they preferred.

Focus groups and individual interviews were conducted following the same moderator guide (Supplementary Materials, Appendix A) to ensure discussion of all topics of interest. The

moderator guide was intended to help the interviewer, not to rigidly structure the conversation; thus, the topics were discussed in a different order depending on the debate. All focus groups and interviews were audio-recorded.

As a starting question, participants were asked about their dairy consumption (i.e. “Do you consume dairy?”) and to share their reasons for consumption and non-consumption of a wide range of cow and non-cattle dairy products (e.g. “Do you consume cow’s milk?” “why is that?”). Participants were not asked to quantify how much they consumed of any given product and were only asked if they do or do not consume each food to begin the conversations. Questioning remained informal and causal, without reference to dietary recommendations or guidelines to ensure participants felt comfortable discussing their true level of consumption and reasons for this. Participants were asked about their consumption of milk, yoghurts, fermented milk, and other fermented dairy, dairy-to-drink, dairy desserts, creams, hard cheeses, soft cheeses, cream cheeses, and local and organic dairy foods. Questions about factors that may lead them to consume more or less dairy products were included. Questions about non-cattle dairy were also asked, as these products are more likely to be associated with local farming<sup>(57)</sup> and goat’s milk has been reported to be more digestible than cow’s milk,<sup>(63)</sup> making this product suitable for consumers sensitive to lactose or other digestion-related issues. Non-cattle dairy products may also be considered less demanding on resources than cow’s dairy, as these animals can live in remote regions and do not need high-input farms,<sup>(64)</sup> but the milk yield of these species is typically lower than cow’s, thus impacting dairy production.<sup>(57,64,65)</sup> Questions were also asked about the consumption of plant-based dairy alternatives, as recent studies have found consumers doubting the need to consume dairy products, both for health and climate change reasons.<sup>(3,7,14,59,66)</sup> Consequentially, the consumption of plant-based dairy alternatives has increased, as has consumer interest in this product category.<sup>(7,60)</sup>

Within each focus group or interview, to stimulate the discussion, participants were provided with the opportunity to taste English and French local cheeses (i.e. a semi-hard cheese, a *Laughing Cow*<sup>®</sup>, a goat’s soft cheese, a blue cheese, e.g. *Roquefort*, a soft cheese, e.g. *Brie*). This consumption was entirely voluntary and was intended solely to stimulate product-related discussion. Participants were also provided with tea, coffee, crackers, and fruits.

### Analysis

A thematic analysis, aiming to explore and identify reasons for dairy consumption, was performed following the guidance of Braun and Clarke, 2006.<sup>(67)</sup> This process included six steps: (1) familiarization with the data collected; (2) the coding process; (3) the creation of themes from the codes; (4) the creation of a thematic map, links between themes and codes and between themes and all data; (5) the creation of names and definitions to clarify each theme; and (6) writing a report.<sup>(67)</sup>

Three researchers were involved in the thematic analysis. All focus groups were conducted, audio recorded, and transcribed by the principal investigator (CF). Transcripts were then coded individually and independently by the principal investigator and one additional researcher in each country, both of whom were native speakers of the country’s language (KMA, JP). Codes were discussed and agreed upon. Individual interviews from both countries were conducted, audio recorded, transcribed, and then coded only by the principal investigator. Due to resource limitations, individual interviews were not double coded; however,

their analysis was conducted after all focus groups were double-coded and the same codes had emerged from the data following coding by the principal investigator.

An inductive approach was used to identify themes and sub-themes<sup>(67)</sup>; they emerged directly from the data rather than were fitted into existing or pre-defined schemes<sup>(67)</sup>. Codes from focus groups and individual interviews were grouped and used by the principal investigator to generate themes and sub-themes, which were further discussed with an experienced second researcher (KMA). Definitions were created to avoid overlapping between themes and ensure that all codes were assigned to one theme and sub-theme only.

### Researchers and reflexivity

All three researchers involved in this study were females. One of them (CF) conducted all focus groups and interviews, was involved in coding all of them, and in generating themes and sub-themes from these codes. The other two researchers were involved in coding focus group transcripts in their native language, English (KMA) or French (JP), to minimize misinterpretation of participants’ statements. All researchers have a background in psychology or nutrition, and this may have had an impact on the coding process. All researchers include dairy products in their diet, but one of the researchers is lactose intolerant. Prior personal experiences and beliefs may also have impacted researchers’ interpretations of what was said during the focus groups and individual interviews and thus have had an impact on the coding process. Double coding and discussion of all codes, themes, and sub-themes aimed to reduce this risk.

### Results

Four focus groups and seven individual interviews were conducted between May and September 2022 in both the UK and France, of which two were mixed-gender and the other two were single-gender (one only males and one only females). Focus groups lasted between 60 and 90 minutes, and individual interviews lasted between 20 and 35 minutes.

### Sample

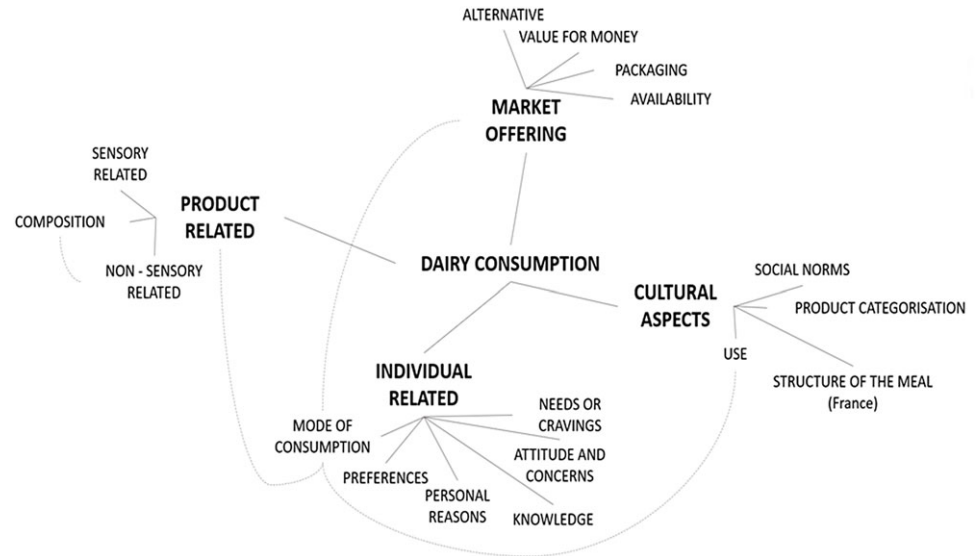
A total of forty-five young adults (UK n = 22; France n = 23) took part in this study.

Twenty-two young adults were living in the UK. Fifteen of them (females n = 8) took part in focus groups in Bournemouth, of which eleven were students and four were working at the time of the study. The average age was 22.7 years old. The remaining seven young adults (females n = 6) took part in individual interviews. All of them were employed at the time of the study, and the average age was 28.1 years old.

Twenty-three young adults were living in France. Sixteen of them (females n = 8) took part in focus groups. Seven were students, two were looking for a job at the time of the study, and all the other participants were employed. The average age was 24.1 years old. The remaining seven participants (females n = 6) took part in individual interviews; five were students, one was employed, and one was looking for a job. The average age was 22 years old.

### Reasons for dairy consumption

Four themes and sixteen sub-themes were reported to have an impact on participants’ dairy intakes in both the UK and France. A



**Figure 1.** Reasons for dairy consumption, themes, and sub-themes. Dotted lines represent a link between themes and/or sub-themes.

seventeenth sub-theme appeared to influence dairy consumption only in France. All themes and sub-themes designate neutral concepts, as the same idea may be described with a negative or positive valence depending on the participant, product, or topic.

All themes and sub-themes are shown in Fig. 1 and defined in Table 1. All are considered independent and describe the different reasons for dairy (non)consumption identified, but some were also related to other themes or sub-themes, as shown in Fig. 1. As we can make no judgements over the degree of influence using thematic analysis, themes are described in a random order.

## Discussion

Many reasons for the consumption and non-consumption of dairy products among young adults aged between 18 and 30 years old in two different countries were found. These reasons were based on aspects that were product-related, individual-related, based on cultural factors of the country they are living in, or market-related policies. Many of these findings agree with previous studies exploring barriers and facilitators to dairy consumption. For instance, other recent studies reported that product-related factors could influence dairy consumption in the same population, but also in younger and older samples.<sup>(33,39,68–70)</sup> Taste, particularly, is a sensory characteristic, that has been found to impact consumption across a range of population groups, and to do so both positively and negatively based on the product type (e.g. milk vs plant-based milk).<sup>(39,70)</sup> The literature suggests that a product's acceptability starts with its sensory aspects.<sup>(71,72)</sup> Participants in similar studies have also discussed product composition,<sup>(68,69)</sup> not only concerning nutritional composition as was found here but also as a barrier to consumption if dairy foods were contaminated.<sup>(69)</sup> While some participants taking part in this study declared consuming dairy for their health, none of them discussed contaminated foods. However, the fact that nutritional composition may act as a barrier or facilitator seems to confirm studies showing that nutritional composition may impact food choices.<sup>(73,74)</sup> Another concept debated in the non-sensory sub-theme was the degree of versatility. Participants in both countries mentioned including (or not) dairy in their meals depending on the type of product and its degree of versatility. The more versatile a product, the more it could be used in different contexts or combination with other

foods. In both the UK and France, different kinds of soft cheeses particularly, are available with different sensorial and non-sensorial characteristics,<sup>(1)</sup> e.g. cream cheese, ricotta, that makes them suitable to be consumed in different contexts of consumption, i.e. in savoury and sweet dishes. Participants reported this as a positive aspect of yoghurts, too, as these products may be eaten or drunk depending on their formats. A recent study exploring facilitators and barriers to dairy consumption among parents of preschool-aged children reported this aspect, as well as another qualitative study conducted among teenagers in Canada.<sup>(33,39)</sup> In this sense, some research sectors are already looking for ways to develop products to improve their versatility.<sup>(63,65,75)</sup> The availability of more versatile products may lead consumers to consider changing their dairy intakes, potentially even appealing to consumers who do not use dairy products already.

Within the individual-related theme, personal preferences, e.g. liking and disliking, were reported to impact dairy consumption and this confirms the current literature.<sup>(76)</sup> Other individual-related factors have also been reported to impact dairy consumption in populations of different age groups.<sup>(33,39,48,68,77)</sup> It is interesting to note that while yoghurt seems to be the most appreciated dairy product in this sample, in both the UK and France, most participants seemed to dislike cultured milks, e.g. kefir, labelling them as “disgusting”. However, only a small number of individuals taking part in the study consumed this category of dairy at the time of our research, and only two people volunteered to taste them if the occasion arose, e.g. during a holiday in a country where fermented dairy is considered a traditional food. Studies confirm that experiences and contextual variables, e.g. the setting, can influence food acceptability<sup>(78)</sup> and suggest that personal preferences and product-related aspects, alongside consumers' familiarity with a product, can influence perceived quality.<sup>(2,57)</sup> Other studies have also explored mode of consumption, and combining dairy foods with other food categories has been suggested as a strategy to increase dairy consumption.<sup>(39,69)</sup> Knowledge, attitudes, and concerns have also been found in previous studies to impact dairy (non)consumption, and depending on consumers' perspectives, these may become facilitators or barriers.<sup>(33,68,70)</sup> Limited knowledge has previously been found as a barrier to consumption, even in the presence of other health consequences.<sup>(48)</sup> One of the most debated topics among our

**Table 1.** Themes (in bold) and sub-themes (in italic) that were reported to impact dairy consumption among young adults in the UK and France

Themes, sub-themes	Definitions
<b>Product related</b>	<b>Attributes of a product per se.</b>
<i>Sensory</i>	Sensory qualities of a product: taste, texture, smell, palatability. “Well, let’s say . . . the texture is a bit thicker, and a small aroma, a bit of taste . . .” (FRFG3P3, about yoghurt to drink)
<i>Composition</i>	Ingredients and nutritional compounds that influence claims and other non-sensory qualities, while not necessarily influencing sensory-related aspects. “It is a good source of calcium, isn’t it?” (UKFG2P4, about yoghurt)
<i>Non-sensory</i>	Nutritional claims, origin, process of production, degree of versatility, and all non-sensory related characteristics. “It’s like obviously, milk is like not processed ( . . . ) whereas like cheese I’d imagine to be like more processed.” (UKFG1P6, about cheese)
<b>Individual related</b>	<b>Attributes related to each participant that differ from one individual to another, are personal and may be unique for each participant.</b>
<i>Mode of consumption</i>	All possible ways to consume a dairy product, e.g. on its own, in a recipe, as a snack, or during a meal. “It is good in pasta dishes, and everything else, you can use it with whatever the food ( . . . ) or alone with a piece of bread or without” (FR1I3, about semi-hard cheese)
<i>Preferences</i>	Personal preferences (e.g. like, dislike). “I don’t like cottage cheese. It’s too lumpy. ( . . . ) I’m just ‘No, I do not want to put that in my mouth’” (UK1I1, about cottage cheese)
<i>Personal reasons</i>	Personal experiences (e.g. habits, allergies, lactose intolerance, acne). “I do not drink it anymore because it makes me sick.” (FRFG2P3, about milk)
<i>Knowledge</i>	All kinds of knowledge and assumptions a person has about dairy products may influence their intake. “Well, I do not know if this is true, but what I know is that everyone keeps telling me that milk fortifies bones . . . it fortifies the body, and I consume it every day, since I do sports and it helps.” (FRFG3P2, about milk)
<i>Attitudes and concerns</i>	Attitudes towards consumption and health, ethics, animal, or environmental concerns (e.g. exploitation, sustainability). “So, although it says plant-based, it’s not necessarily more environmentally friendly.” (UKFG4P5, about plant-based dairy alternatives)
<i>Needs or cravings</i>	Consumption for health (needs) vs. consumption for pleasure (cravings). “I started drinking milk again, I cannot say I drink it every day, but when I feel as I miss it, I drink a glass of it” (FRFGP3, about cow’s milk)
<b>Cultural aspects</b>	<b>Attributes related to the cultural or social background, including traditional customs.</b>
<i>Product categorization</i>	How dairy products are classified or grouped based on their use or nutritional aspects (e.g. protein content). “Generally speaking, I categorize “cheese” and “meat”, so I cannot substitute them. It is not logical to swap a piece of meat with a piece of cheese for me” (FRFG3P3, about cheese)
<i>Social norms</i>	Peers and family influence. “I do it just to be fancy, like . . . I do just to be fancy in front of my friends.” (UKFG3P3, about soft cheese)
<i>Use</i>	Dairy is consumed because of traditions or cultural customs. “Yes, yes, yes. We have it and it is traditional to consume it with some specific dishes” (FRFG2P5, about fermented dairy)
<i>Structure of the meal</i>	<i>Only in France.</i> The course of the meal during which dairy products, and particularly cheese, should be eaten. “The cheese, in a dish of pasta or as dessert.” (FRFG3P4, about cheese)
<b>Market offering</b>	<b>Attributes related to dairy market supply.</b>
<i>Availability</i>	Presence of dairy products in the shops. “Still, if I can find it in a supermarket, I can have it. But it’s not very common, I think. And I haven’t seen in any supermarket.” (UK1I4, about goat’s milk)
<i>Alternatives</i>	Possibility to substitute other products with dairy or dairy with similar dairy products. “You can’t taste difference really? Can you, between adding yoghurt and adding like cream, blindly do, or can you? I don’t know. I think it does the same job” (UKFG3P3, about cream)

(Continued)

**Table 1.** (Continued)

Themes, sub-themes	Definitions
Value for money	All aspects related to price, including the concept of cost-efficiency. “I buy them as like this is great saving money” (UKFG2P3, about yoghurt)
Packaging	Packaging, portion size, shelf-life. “Also don’t like how it says consumed in three days because I’m not going to eat the whole yoghurt in like three days you know (...) So saying that you have to keep consuming it for three days, it kind of stops me from buying it. (...) Because it’s just you. You’d be like, you can’t finish all that food, you can’t!” (UKFG2P4, about yoghurt)

sample was whether dairy should or should not be consumed in adulthood for health and/or environmental reasons. While not all participants agreed about the role of dairy in adulthood, some of them described it as unhealthy. In recent studies, while some participants also classified dairy as healthy,<sup>(69,70)</sup> others agreed that consuming dairy is not healthy or required for humans in adulthood.<sup>(48,70)</sup> In the current sample, some participants explained that dairy is unnecessary for adult health, and may even be harmful as it is rich in fats, thus high in calories, and this is in line with other similar studies.<sup>(39,70)</sup> This misconception may be related to the fact that for years, dairy products, and particularly whole-fat products, have been considered to negatively impact human health as high intakes of saturated fat are associated with cardiovascular and other metabolic diseases.<sup>(20,78,79)</sup> However, results from cohort studies have more recently demonstrated a positive impact of dairy consumption on body weight and overall health,<sup>(21,29,80,81)</sup> particularly in the presence of an adequate intake of fermented dairy.<sup>(11,20)</sup> Moreover, recent studies highlight the importance of considering dairy as a complex matrix, rather than considering each component e.g. saturated fat, and calcium, individually.<sup>(20,78,82)</sup> It is interesting to note that some participants stated dairy products should be consumed, but admitted not knowing how much per day and this seems to confirm that although national guidelines advise consuming dairy daily,<sup>(28,80,81)</sup> recommendations may be misinterpreted.<sup>(83)</sup> For instance, some participants in France reported decreasing their milk consumption to align with national dietary recommendations, and a further reduction in milk consumption is expected in the next few years due to an update of the Nutri-Score algorithm, which downgrades milk from A to B or C depending on the fat content.<sup>(84)</sup> Milk non-consumption for personal reasons included mention of lactose sensitivity or intolerance. While not all adults develop lactose intolerance, some experience digestive complications, diarrhoea, and abdominal pain due to dairy ingestion,<sup>(85)</sup> and this has already been explored as a barrier to consumption.<sup>(48)</sup> The potential discomfort may lead young adults to stop consuming milk, even though, for the majority of them, the consumption of small intakes of milk and milk derivatives is considered safe.<sup>(85)</sup> Promoting health literacy among young adults is fundamental to allowing them to engage in healthy diets and achieve healthy lifestyles.<sup>(83,86)</sup>

Alongside health concerns, sustainability challenges were also discussed. Participants wondered if dairy products are environmentally and animal-friendly, and often stated that animal-based products can only be harmful to the ecosystem. A transition to a more environmentally friendly diet is needed, and participants seemed curious about new plant-based dairy alternatives. Several participants reported deliberately decreasing their milk consumption in favour of plant-based milk drinks, for environmental

reasons, although yoghurt and cheese consumption was unaffected as participants seemed to find it hard to give up their favourite dairy foods. Recent studies have investigated the transition from animal-based dairy consumption to plant-based dairy alternatives,<sup>(70,87,88)</sup> exploring not only new products and perceived sensory characteristics but also attitudes toward sustainability.<sup>(70,87,88)</sup> An increasing number of consumers direct their attention to plant-based dairy alternatives<sup>(70)</sup> and justify their reduced dairy consumption with reasons related to environmental concerns and animal welfare.<sup>(89)</sup> However, studies exploring reasons for dairy (non)consumption showed that environmental issues are still not the main reasons that lead consumers to switch from animal-based to plant-based dairy foods as the strongest drivers remain related to pleasure and convenience.<sup>(33,70,90)</sup> Participants also debated about the duality of consuming dairy for health vs consuming it for pleasure (needs or cravings), particularly on occasions of indulgence, even when participants felt they would likely experience negative bodily symptoms. This sub-theme has also been found to impact dairy consumption among Canadian teenagers, who debated about control and self-efficacy.<sup>(33)</sup> Studies suggest that dairy, as with other food products, may be consumed as comfort foods to treat or reward when celebrating or to aid in coping with negative emotions, sometimes until feeling guilty or sick.<sup>(91–93)</sup>

In the theme cultural aspects, culture and traditions were found to have roles as barriers and facilitators to consumption. Consumers in different countries were found to describe foods differently, even when they are all in the same food category. Some participants reported that they do not think about all dairy foods in the same way, particularly they referred to some products as fake dairy, e.g. vegan cheese, *Laughing Cow*<sup>®</sup> (Groupe Bel, Leitchfield, USA); the majority of them also seemed to perceive fermented dairy and cultured milks as a different group of products when compared to yoghurt, even if the bacteria used for fermentation are often the same and the production processes are similar.<sup>(10,19)</sup> Some participants also referred to dairy foods as products that were different from meat, eggs, and tofu, which makes dairy products unsuitable for substitution with other protein-rich foods within a meal. Another study exploring cross-cultural aspects of the meal and comparing France to Norway found that among French participants dairy is not considered as part of the protein group with meat and fish, but interestingly plant-based milks are included in milks group.<sup>(90)</sup> The categorization of dairy products as a different food group has previously been investigated, as people tend to classify food based on origin and production,<sup>(90,94)</sup> but studies suggest that cultural mechanisms could have a strong impact on the categorization process.<sup>(56,95)</sup> As with this sample, other studies have found social influences to have a role in

encouraging dairy (non)consumption, whatever the age of the sample.<sup>(48,68,69,72,77)</sup> Interactions with family members, peers, and co-workers were reported to impact food choices,<sup>(95)</sup> and the sub-theme ‘use’ refers to all contexts of consumption that are directly impacted by culture<sup>(54)</sup>; these being different between the UK and France. Contexts of consumption depend notably on the individual,<sup>(2,38)</sup> but it is well known that food plays a role in a more complex social system and that customs, religion, and norms may impact not only *when* participants eat a certain food but also *how*.<sup>(96)</sup> The structure of the meal sub-theme was reported to influence dairy consumption only in France. This sub-theme may reflect a cross-cultural difference. Anecdotally, France and other Mediterranean countries like Italy, seem to have more structured meal patterns in which cheese can be a snack or part of a meal, but it is mostly consumed at the end of the main meal, i.e. lunch, dinner.<sup>(97)</sup> These countries have a long tradition of dairy farming, and each product seems to have its own place on the menu: within the meal, in combination with other foods, or at the end of the meal.<sup>(98)</sup> For instance, eating cheese is a very traditional element of French meals,<sup>(90)</sup> particularly at the end of dinner, and pairing it with wine or jam seems part of French food culture,<sup>(99)</sup> whereas, in other food cultures, cheese may be consumed at other times of the day, e.g. at breakfast in Scandinavian countries.<sup>(100,101)</sup> This may be affected by the traditional service *à la française*, a way to structure the meal that was popular in France in the eighteenth century, where at the end of the meal, diners would cleanse their palates by eating cheeses.<sup>(99,102,103)</sup>

Availability has previously been reported to impact food choice,<sup>(54,95)</sup> and some participants reported always buying foods from the same store when available. However, if it was not available, they would not go to another store just to buy that specific product. Other studies also demonstrate this impact on consumption of availability.<sup>(69,77,87,104)</sup> Alongside availability, the concept of value for money was discussed as the money used to buy a product and the value of a product, for instance, in terms of quality or convenience, e.g. products sold in bigger quantities. Participants reported that they may consider increasing or reducing their dairy intakes based on market prices, and while some would not sacrifice quality over price, many participants reported not buying organic or local dairy because the ratio of price/quantity was too high. Other studies have found that cost could act as a barrier to consumption, for both dairy and plant-based dairy alternatives among different age groups in different countries.<sup>(68–70,77,90)</sup> However, a recent study suggests that diets rich in certain dairy foods, i.e. milk, cheese, fromage frais, and yoghurt, provide enhanced nutrition and are less expensive than diets that are lower in dairy.<sup>(18)</sup> In this sense, increasing dairy consumption could benefit consumers sensitive to improving their health while spending less money. Moreover, participants seemed more likely to buy a product when it was sold in small portions. They stated that dairy products were often sold in portions that were too big or with a short shelf-life, which may lead to food waste. Shelf life was reported as a barrier to consumption in other previous studies as well as the other market-related sub-themes.<sup>(68–70)</sup> Pack size indeed has a role in household waste,<sup>(16)</sup> and wasting food also impacts GHG emissions and food insecurity.<sup>(105)</sup> New packaging from biodegradable materials<sup>(106)</sup> could be combined with smaller pack sizes, which are easily available and sold at affordable prices<sup>(16)</sup> to permit consumers to buy the quantity they need, thus reducing the risk of waste.

The comparison of the two countries in our study provided some interesting observations. Our findings mostly agree with previous studies conducted on facilitators and barriers to dairy

consumption in other countries among different age groups, but the discussion of a range of dairy products and the direct comparison of the UK and France led to the emergence of some topics that may not otherwise have materialised. However, the number of participants in the study was limited, and further investigations in larger samples are necessary. Moreover, dairy intakes were not recorded for any of the participants, and these could have helped assess direct links between knowledge, the interpretation of recommendations, and intakes. Lastly, the sub-theme structure of the meal was reported only by participants in France, but it may be the case that participants in the UK did not report it as they did not consider this an important factor in defining their dairy consumption. Studying a larger sample, e.g. through a population-wide questionnaire, would help address some of these concerns.

Some strategies for increasing healthy dairy intakes can be suggested from our findings. Better practical communication for young adults may facilitate intakes as limited knowledge and some misunderstanding was found, as well as a labelling system that gives clear information about recommended portion sizes, and promoting tools that may lead young adults to acquire confidence in using dairy, e.g. cooking-related skills. Despite the small number of participants, many in our sample seemed interested in reducing food waste or their impact on the environment, but market offers did not always seem to be aligned with their needs. The consideration by retailers to expand the availability of a variety of dairy products in assorted portion sizes may encourage households of different sizes to consume more dairy foods.

## Conclusion

Four themes and seventeen sub-themes were found to influence dairy consumption in young adults, both students and non-students, aged between 18 and 30 years old, in the UK and France. ‘Product-related’, ‘individual-related’, ‘cultural aspects’, and ‘market offering’ themes were reported to impact consumption in both countries, although the sub-theme ‘structure of the meal’ was only reported in France. With the exception of this specific aspect of consumption, our results suggest that reasons for consumption and non-consumption of dairy products are similar in young adults in the UK and France.

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**Data availability statement.** Data are available on reasonable request of the corresponding author.

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