The concept of ultra-processed foods (UPF)

Position statement (updated May 2024)

British Nutrition Foundation position statements set out our views on important areas in food and nutrition and provide guidance to researchers, regulatory agencies and policy makers, health professionals, the food industry and the media. This position statements was produced by our team of expert nutrition scientists and reviewed by the Chair of the Board of Trustees and the Foundation's Scientific Committee, a group of independent experts that advises on the interpretation and translation of scientific information as part of our governance.

Our position

A number of countries advise the reduction or avoidance of 'ultra-processed foods' (UPF), a category of foods described within the NOVA classification system by the 'extent', 'purpose' and 'nature' of food processing, within national dietary guidelines. This is based on evidence, largely from observational studies, linking high intakes of UPF with poor health outcomes including heart disease, type 2 diabetes, obesity and cancer. Although such studies have shown consistent associations, it is difficult to untangle the impact of less healthy dietary patterns and lifestyles and they do not provide clear evidence of a causal association between processing *per se* and health. At present in the UK there is no agreed definition for UPF and they are not referred to in government dietary recommendations.

The NOVA UPF definition is broad and captures many foods that have a poor nutritional profile, are energy dense and high in fat, sugars and salt. Understanding of other mechanisms to explain adverse effects of 'ultra-processing' on health is limited but an important area of research. As the links between excess consumption of saturated fat, sugars and salt and poorer health outcomes are well established, the British Nutrition Foundation supports approaches to reduce their consumption. Reformulation, with the potential of improving nutritional intakes without changing consumer behaviour, should continue to be part of a suite of strategies to improve the quality of our diets. Alongside dietary advice to consume foods such as fruit and vegetables, wholegrains, pulses and other good protein sources, consumers need to be supported to choose healthier versions of processed foods and this can include some nutrient-dense, affordable UPF. In countries such as the UK, UPF currently make a significant contribution to total dietary intake. Whilst support to reduce intakes of less healthy processed foods is important, blanket advice to avoid UPF may have unintended consequences that have not been fully investigated for different groups within the population.

Discussions on UPF bring a welcome opportunity to highlight the importance of healthier dietary patterns. The Scientific Advisory Committee on Nutrition (SACN) 2023 **position statement** evaluating the classification and the suitability of UPF as a dietary exposure has provided some clarity in this area. In agreement with SACN, at present, the British Nutrition Foundation believes that due to the lack of agreed definition, the need for better understanding of the mechanisms involved and concern about its usefulness as a tool to identify healthier products, UPF does not warrant inclusion in national dietary guidelines. However, strong and comprehensive action to improve the food environment is critical to reduce the high prevalence of obesity and non-communicable diseases. In addition, research to improve our understanding of the mechanisms linking UPF with adverse health outcomes is warranted to provide translatable advice to manufacturers and retailers in relation to any other aspects of foods/drinks, beyond their nutritional composition, that may influence healthier dietary choices.

Key points

- There is good evidence that energy-dense, nutrient poor dietary patterns, with high intakes of foods high in saturated fat, sugars or salt (HFSS), are detrimental to health. Dietary patterns higher in fibre, vitamins and minerals, based on nutrient-rich foods such as wholegrains, fruits and vegetables, fish, pulses, nuts, seeds and dairy foods, are associated with better health outcomes. Such diets are the basis of national and international dietary guidelines.
- In UK policy, HFSS foods and drinks are defined using the FSA nutrient profile model which also considers beneficial nutrients/food components (i.e. fibre, protein, fruit, vegetables and nuts). Many UPF have poor nutrient profiles, are high in ingredients widely recommended to be limited and low in ingredients we want to encourage (e.g. some biscuits, confectionary, cakes and fried/salty snacks). Displacement of healthy foods with these would be detrimental to health. However, the definition of UPF can also include foods such as sliced wholemeal bread and lower sugar wholegrain breakfast cereals which can contribute to an affordable healthy, balanced diet.
- Classification systems that categorise foods based on the 'extent of processing', are not universally accepted. The most widely used and applied UPF definition in the scientific literature is from the NOVA food classification system but this has been criticised for being too broad across and within categories. For example, a lower sugar wholegrain breakfast cereal with chicory inulin isolate, a high-sugar refined breakfast cereal, a multi-seed sliced wholemeal loaf and a white sliced loaf would all be classified as UPF. It has been suggested by critics that NOVA is difficult to interpret, challenging to apply robustly to dietary data (e.g. food frequency questionnaires are usually not validated to assess UPF) and its scientific rationale has been questioned. As it can imply that expensive artisanal products are superior for health, the health equity of advice to limit intake of UPF in the current backdrop of rising food insecurity and the cost of living crisis is also an important consideration. Furthermore, its application for use with consumers to change dietary behaviour has not been fully investigated. The UPF definition also includes foods and drinks needed for medical or nutritional purposes (e.g. gluten free products, fortified plant-based milk alternatives), for which there is often no accessible or convenient alternative.
- Research has linked high intakes of UPF with a range of adverse health conditions including obesity, cancer, type 2 diabetes and cardiovascular diseases, irritable bowel syndrome, depression and frailty conditions and all-cause mortality. However, this is largely based on observational studies that, by design, cannot demonstrate cause and effect. As much of the research is observational, good-quality studies on possible mechanisms by which particular risk factors (e.g. aspects of processing, specific ingredients or packaging types) may cause ill health are needed. The UPF concept, supported by the findings from epidemiological studies, is raising some interesting research hypotheses that are a priority for future research Understanding why diets high in UPF are linked with poor health is crucial, particularly as food processing encompasses a broad spectrum of processing techniques. For example, recent research suggests that the impact of food texture and food matrix integrity on health could have relevance to healthier food innovation.
- The food environment is a key driver of diet-related poor health, facilitating the easy accessibility of unhealthy dietary patterns. There is an urgent need to increase the availability, affordability and desirability of healthier diets. Processing can play an important role here, as well as in food safety and in extending shelf life, a consideration in terms of access to affordable nutrition and reducing food waste.
- It has been estimated that UPF intake in the UK ranges from 51% to 68% of calories, varying within this range by age and socioeconomic status. Whilst industry has a responsibility to develop, market and promote healthier options, blanket messaging to consumers, via policy tools or nutrition communications, to avoid or reduce UPF may have unintended consequences. Demonising all processed foods could foster feelings of guilt

and stigma around food choices, adversely impacting intake of more affordable sources of nutrients. Increasing cooking skills is undoubtedly to be encouraged, but negative messaging could imply we have to spend more money on unprocessed foods and more time in the kitchen to prepare healthier meals completely from scratch, when this is not the case. Some UPF foods such as vegetable-based sauces can aid the preparation of low-cost nutritious home-cooked meals, by combining these with basic ingredients such as a protein source (e.g. canned fish/pulses), wholegrain or higher fibre starchy foods and vegetables. Alongside improvement to the food environment, we would like to see innovative, inclusive and actionable support to help consumers identify and prepare nutrient-dense, healthier meals and snacks, which can include healthier processed foods.

- It is useful to consider whether messaging to avoid UPF might discourage industry from reformulation to improve the nutritional profile of products including both the addition and removal of nutrients of public health importance.
- As food processing plays a relevant role in food system sustainability and ensuring food security, consideration also needs to be given to the environmental impact of different UPFs to support advice on healthier and more sustainable dietary choices.

Background

Why have we produced this position statement?

Poor dietary habits are associated with a range of chronic diseases, and it is recognised that a food environment promoting diets high in energy, saturated fat, free sugars and salt is contributing to unacceptably high rates of obesity in children and adults within the UK population and elsewhere [1, 2].

In recent years research interest in the concept of 'ultra-processed food' (UPF) has increased. Headlines in the mainstream media have cautioned against their increased presence in the modern food system and highlighted research reporting that a range of adverse health outcomes are associated with their consumption. Some countries now advise the reduction of UPF intake as part of national dietary guidelines [3-9] and the concept is being considered for possible inclusion by others [10-12]. However, some researchers have questioned the usefulness of focussing on the 'extent of processing' beyond the conventional system of classification by nutritional quality [13-20].

This position statement aims to provide an informative and referenced consideration of the concept of UPF and its relevance as a framework for dietary advice in the UK. It was developed by the British Nutrition Foundation alone but informed by discussions held at a roundtable event of key stakeholders including representatives from academia, policy, behavioural science, communications, health, food science, retail and consumer interests in July 2022 [21]. It has been reviewed for scientific integrity by the Foundation's Chair of the Board of Trustees and its **Scientific Committee**.

Outlining the arguments for and against classifying foods by 'extent of processing'

Advocates of the concept argue that foods and drinks classified as UPF are 'non-nourishing' (i.e. typically lacking in intact, fresh ingredients, fibre and micronutrients) and should be avoided due to proposed direct and indirect harmful effects on health. These include the promotion of overeating, displacement of non-UPF foods in the diet and harmful effects of certain ingredients such as additives [22-26]. Proponents argue that it is the 'ultra-processing' properties of UPF over and above their nutritional attributes that are associated with harms. However, the classification of foods by their 'extent of processing' and whether or not there are any links between processing *per se* and health is a topic of debate in nutrition science. Critics argue that the focus should remain on high consumption of less healthy foods e.g. those classified as high in salt, sugar and fat (HFSS) (many of which will also be classified as UPF) where there is stronger evidence for links with poor health outcomes [13, 14, 16, 17, 19, 20]. The use of nutrients and nutrient profiling to determine the 'healthiness' of foods has therefore been suggested to remain the most evidence-based approach for the basis of dietary advice and policy.

Scientific summary

What are 'ultra-processed foods' (UPF)

- The NOVA (a name, not an acronym) classification system, developed by the Brazilian nutrition and health researcher Professor Carlos Monteiro and colleagues, is the most widely used classification of foods and drinks by their 'extent of processing' and provides a definition of UPF [27, 28].
- According to NOVA, food can be classified into four groups:

  - NOVA group 1, unprocessed or minimally processed foods (includes foods such as fruit and vegetables, meat, eggs, milk, grains, pulses).
  - NOVA group 2, processed culinary ingredients (described as substances obtained directly from group 1 foods or from nature, e.g. oils and fats, sugar and salt).
  - NOVA group 3, processed foods (described as industrial products made by adding salt, sugar or other substances found in group 2 to group 1 foods, using preservation methods such as canning and bottling, and, in the case of breads and cheeses, using non-alcoholic fermentation).
  - NOVA group 4, ultra-processed foods.
- NOVA group 4 UPF are described as 'formulations of ingredients, mostly of exclusive industrial use, typically created by a series of industrial techniques and processes (hence 'ultra-processed')', 'formulated mostly or entirely from substances extracted from foods or derived from food constituents' and '…made possible by the use of many types of additives, including those that imitate or enhance the sensory qualities of foods or culinary preparations made from foods.'. The processes and ingredients used in the manufacture of UPF have been described as making them highly convenient (ready-to-consume, almost imperishable) and attractive ('hyperpalatable'[1]). While this point of view may resonate more in the context of UPF such as biscuits, desserts, pastries, pies, processed meat products, confectionery or salty and fried snacks, it may be less clear how elements of these descriptions, for example 'hyperpalatable', apply to some non-HFSS UPF or those required for special diets (such as shop-bought wholewheat or rye bread, dairy alternatives, unsaturated fat spreads, textured soya protein and gluten-free bread).
- The NOVA definition of UPF is not universally accepted [13, 14, 19, 20, 29-31] and has been criticised as ambiguous and overly simplistic, with definitions that have changed over time. Some aspects of UPF definitions relate to formulation (i.e. the use of specific ingredients such as fats, sugars, salt, 'cosmetic' additives, notably flavours, colours and emulsifiers, as well as sweeteners), rather than processing *per se* [17, 31-34].
- Advocates argue that NOVA is fit-for-use within policy and that it is misunderstood by critics [22, 35]. However, there is evidence in the scientific literature to suggest that the NOVA categorisation of food data from dietary intake surveys is inconsistently applied. In some cases, the need to make assumptions because of a lack of information/ingredients list creates risk of misclassification [13, 17].

What is the evidence that consumption of UPF cause ill health?

- A large number of papers report statistically significant associations between the higher consumption of UPF and poor health outcomes including increased risk of obesity, type 2 diabetes, cardiovascular disease and all-cause mortality [36-39].
- The bulk of evidence linking higher intake of UPF with poor health outcomes is derived from observational studies, which cannot show cause and effect and have other limitations. For example, identifying UPF within dietary intakes can be particularly challenging from food frequency questionnaire data.

[1] Some products that would be defined as ultra-processed are carbonated soft drinks; sweet, fatty or salty packaged snacks; candies (confectionery); mass produced packaged breads and buns, cookies (biscuits), pastries, cakes and cake mixes; margarine and other spreads; sweetened breakfast 'cereals' and fruit yoghurt and 'energy' drinks; pre-prepared meat, cheese, pasta and pizza dishes; poultry and fish 'nuggets' and 'sticks'; sausages, burgers, hot dogs and other reconstituted meat products; powdered and packaged 'instant' soups, noodles and desserts; baby formula; and many other types of product [27, 28].

- Some evidence suggests that the highest UPF consumers are more likely to be younger, live in the most deprived areas and have lower physical activity levels [40].
- It has been suggested that diets higher in UPF could be indicative of a poor dietary pattern overall, which may explain associations with negative health outcomes. After adjusting for dietary quality, some observational studies have not shown significant associations between UPF and negative health outcomes, although the majority of studies have shown persistent effects [41].
- Recent analysis of two large US prospective cohorts, the Nurses' Health Study and the Health Professionals' Follow-up Study [42], with repeated dietary assessments and follow-up for more than 30 years, reported 4% higher all-cause mortality amongst participants in the highest quartile for UPF intake than those in the lowest quartile. However, the relationship between different UPF foods and mortality risk was inconsistent and a score of diet quality showed a more consistent relationship with overall mortality than the UPF score.
- Evidence from randomised-controlled trials investigating the effect of UPF intake on human health is limited at present, though more studies are planned or currently underway.
- The residential study by Professor Kevin Hall et al. [43] represents an interesting and important contribution to the evidence base. This showed an 'ultra-processed diet' increased *ad libitum* energy intake and weight gain despite being matched to the 'unprocessed diet' for presented calories, sugar, fat, sodium, fibre and macronutrients. The eating rate (i.e. speed of eating, both expressed as calories consumed per minute and grams consumed per minute) and energy density (of the foods) were significantly greater for the UPF diet versus the unprocessed diet, but participants did not report significant differences in the pleasantness of the meals. Likewise, in a study combining data on 330 foods from four countries, on average, energy intake rate (kcal/min) from UPF was higher than from processed and minimally processed foods, though there was a large amount of variation within NOVA categories [43]. Several studies have indicated that both higher energy density and higher eating rate lead to increased energy intake [44-46].
- It has been suggested that categorising foods solely on nutrient content (referred to as 'nutritional levelling') ignores the effects of processing on food matrix integrity, form and texture [24] and such mechanisms may potentially underlie some of the reported associations between UPF and adverse health outcomes. Food form and texture can affect eating rate [44-46]. Foods with softer textures are typically consumed more quickly than foods with harder textures and liquids can be consumed more quickly than solid and semi-solid foods. Consideration of the potential impact of food processing on food structure and food intake in the context of energy balance is valid [47].
- It has also been suggested that UPF may promote energy overconsumption as 'ultra-processing' disrupts natural food matrices [48]. Changes to food matrix integrity as a result of processing (e.g. whole nuts vs chopped or ground nuts or nut butter; dairy fat within yogurt and cheese vs. butter; whole fruit vs. fruit juice; whole oats vs. oatmeal) can affect the release, absorption and metabolism of nutrients (e.g. fat, starch, sugars) and satiety [47,49-55]. It should, however, be noted that processing encompasses a broad spectrum of many different techniques with wide-ranging effects on nutrient retention and food structure [44, 56-58].
- Other suggested mechanisms by which UPF have been postulated to negatively impact health include harmful effects of contaminants from packaging materials (e.g. bisphenols, phthalates, mineral oils, microplastics), contaminants produced during processing (acrylamide, acrolein) and 'cosmetic' additives (notably flavours, colours

and emulsifiers, as well as sweeteners) [13, 22, 24, 59]. The latter are suggested to have wide-ranging effects including promoting inflammation, promoting overeating, presenting 'mismatched' flavour-nutrient signals to the brain or altering the gut microbiota [60-62].

- Food additives are added to many processed foods to modify flavour, colour, stability and texture but their use is regulated, with evidence of safety required prior to approval for use, which is kept under review and re-evaluated [63, 64]. It has been suggested that additives may have adverse health effects that are not captured by current safety assessments and unknown detrimental 'cocktail effects' [60, 65] but, as yet, there is little evidence to support such concerns. Studies are underway to collect more data on exposure to additives in populations [60]. Additives must be declared on food labels and this information must be available within the ingredients list to consumers. Researchers have pointed out that some process contaminants can be generated when cooking in the home (whereas processes are controlled in an industrial setting) and that changes have been implemented within the food industry to reduce the concentrations of known contaminants [19, 33, 34, 66, 67]. While it is important that any suspected ill-effects of specific ingredients and processing techniques are investigated and monitored [68-70], at present evidence for these mechanisms in the context of UPF and health remains more limited [71].
- Currently, the only specific advice related to processed foods within the UK's healthy eating model, the Eatwell Guide, is that those who eat more than 90g of red or processed meat per day, should try to cut down to no more than 70g per day [72]. Evidence shows that high intakes of processed meat are associated with increased risk of colorectal cancer, based on systematic reviews undertaken by leading global health organisations, along with supporting mechanistic work [73, 74].

Does ultra-processing have a role in a modern food system?

- Food processing is essential for food safety and security, including extension of shelf life, which reduces food waste and improves durability for food distribution. Messaging to avoid or reduce consumption of UPF may raise concerns about all food processing and specifically, additives, among consumers. In a repeated YouGov survey commissioned by the British Nutrition Foundation[2] (n=2323 GB adults, March 2023), 44% stated that they were trying to reduce some kind of processed food[3] in their diet, compared to 36% in 2021 (n=2127 GB adults, January 2021) [75].
- The nutritional composition of foods and drinks classified as ultra-processed vary greatly. It is important to note that many of these are energy dense and nutrient poor, specifically being high in nutrients of concern (saturated fat, sugar or salt) and providing low amounts of nutrients that are lacking in the diet, including fibre, and should be limited. However, other UPF feature in many dietary guidelines as foods to be encouraged (e.g. wholemeal bread, lower sugar fruit yogurts, reduced sugar and salt baked beans, lower sugar wholegrain breakfast cereals, unsaturated fat spreads). Such foods can contribute significantly to intakes of some essential nutrients in the UK (see Appendix) and this has been highlighted in relation to other settings [76-78]. Unintended consequences of advice to reduce UPF should therefore be considered.

[2] The research was conducted by YouGov on behalf of the British Nutrition Foundation. 2323 adults from across Britain (49% male, 43% social grade C2DE) were surveyed between 22 – 23 March 2023. The survey was carried out online. The figures have been weighted and are representative of all GB adults (aged 18+).
[3] Processed food, ultra-processed food or both.

For example, intakes of pulses (commonly consumed as baked beans in the UK, contributing 53% to pulses intake by weight)[4] are already below those needed to bring UK diets in line with the Eatwell Guide [79]. Dietary advice to avoid all foods classified as UPF would therefore be at odds with some aspects of current guidance and could be detrimental to some nutrient intakes.

- Although UPF are more likely to have red, and less likely to have green, front-of-pack traffic light labels, some have healthier front-of-pack labelling scores (*using a categorical measure from four green to four red FOPL traffic lights*) with multiple green traffic lights (80). In this study, the researchers also found that UPF were higher in energy, fat, saturated fat, sugar and salt than minimally processed foods, but not all UPF were considered unhealthy according to FOPL. The most common ultra-processed foods with no red FOPL traffic lights included sandwiches (n=65, 7.6%), high-fibre breakfast cereals (n=43, 5.0%), other milks (e.g., plant-based milk alternatives, milkshakes) (n=38, 4.5%) and white bread (not high fibre, not multi-seed) (n=35, 4.1%). There is therefore a lack of clarity around how processing might be used in line with current UK food and drink labelling to aid consumers in purchasing healthier foods.
- Several foods classified as UPF are fortified with micronutrients (e.g. breakfast cereals, children's yogurts and fromage frais, dairy milk alternatives, packaged breads, fat spreads) and/or are needed for individuals required to follow a specific diet for medical or nutritional reasons (e.g. products suitable for those with coeliac disease, meal replacement products for older adults with reduced appetite, infant formula).
- Plant-based meat alternatives may be useful for some consumers adapting to a more plant-based diet. Many would be classified as UPF according to NOVA, but there will be a variation in the nutrient profile within this category. It is important to encourage consumers looking for these products to select those with a better nutritional profile (considering saturated fat, salt, fibre, protein and micronutrient composition) within a healthy, balanced and more sustainable diet.
- It has been estimated that foods that would be classified as UPF make up over half of our energy intake in the UK [81-83]. Removing UPF from diets completely would require a substantial change in eating patterns which would be unachievable for many. While cooking healthy meals from scratch and basing the diet on foods such as fruit and vegetables, wholegrain and higher fibre starchy foods is to be encouraged, an 'unprocessed' diet or a diet devoid of processed foods is likely to be inaccessible to a large number of people within the UK. This could include older adults with dexterity issues, those with poor access to cooking equipment, those with limited cooking skills, those struggling to afford energy and food, those with busy lifestyles. Some foods that would be classified as UPF, such as vegetable-based sauces and packaged breads, can help consumers put together healthier and more nutritious, home-cooked meals/packed lunches. Processed foods, including UPF, can offer significant benefits for consumers including reduced cooking times, affordability and convenience and advice to avoid UPFs may act to demonise all types of processed foods. It is also worth noting that homemade foods and meals are not always healthier; and ingredient selection and cooking method is key.

[4] Secondary analysis of National Diet and Nutrition Survey year 11 data conducted by the British Nutrition Foundation in December 2022.

- Any changes to UK dietary advice must be carefully considered, particularly where there is a high risk of confusion and unintended consequences, including disengagement with other dietary advice.

Important considerations for future research

- Further mechanistic research is required in order to establish whether any particular components or attributes of foods/drinks classified as UPF (e.g. additives, packaging chemicals, 'hyperpalatability') or any particular processing techniques (e.g. those that produce a soft texture/reduce the integrity of the food matrix) explain the observed links between high consumption of such foods and poor health outcomes [84]. The health implications of any measured biological effects (e.g. changes in the gut microbiota) need to be more clearly established.
- Furthermore, research should consider whether there are other drivers of high consumption of some UPF, beyond possibly energy density and forms/textures, that may be contributing to the association between UPF and weight [85]. Some of the proposed mechanisms are still underexplored but such research may be particularly relevant to the food industry in consideration of innovation/new product development.
- Considering the characteristics (including nutritional, sensory, structural and formulation) that can differ between UPF and their unprocessed equivalents and the fact that processing encompasses a broad spectrum of methods, designing randomised controlled trials to tease out which aspects of 'ultra-processing' might be responsible for observed impacts on health markers, is challenging. This is important to consider when interpreting the results of existing human studies and the design of future studies.
- It would be useful for data on the quantities of additives present in food and drink products to be available within comprehensive food composition databases for research purposes. This would support more information on exposure and monitoring of changes to the food supply as a result of reformulation efforts.
- Focussing on food processing over nutrient composition may discourage reformulation thereby hindering efforts to improve nutrient intakes and reduce energy density by stealth. It will be important to investigate whether countries that include avoiding/reducing UPF in population dietary guidelines observe any decline in industry reformulation activities.
- The demonisation of UPF could result in stigmatisation, guilt and shame among those who rely on processed foods as the basis of many meals, and the impact of such messaging should be a research consideration. It is important to explore the feasibility of limiting consumption of UPF for different groups and how they might interpret such advice.
- It would be useful to establish any potential effects of avoidance of UPF on nutrient intakes within the UK, as well as any environmental impacts, through modelling work, and to compare this to modelling work undertaken using HFSS nutrient profiling.

Appendix

Percentage contribution to nutrient intakes (where >5% in at least one age group) in the UK population from selected food types typically classified as UPF *						
White bread						
Age (years)	**1.5-3**	**4-10**	**11-18**	**19-64**	**65-74**	**75+**
Calcium	7	11	12	9	8	8
Fibre	7	9	10	7	6	7
Folate	5	7	8	5	4	4
Iron	7	9	10	7	6	7
Zinc	5	6	6	4	4	4
Sodium	10	12	11	8	8	7
Protein	6	8	8	5	5	5
Wholemeal, brown, granary and wheatgerm bread						
Age (years)	**1.5-3**	**4-10**	**11-18**	**19-64**	**65-74**	**75+**
Fibre	7	6	6	8	10	13
Iron	6	4	5	6	8	10
Sodium	5	4	5	6	8	9
High fibre breakfast cereals (NSP Englyst fibre ≥4g/100g or more)						
Age (years)	**1.5-3**	**4-10**	**11-18**	**19-64**	**65-74**	**75+**
Calcium	4	4	3	3	4	5
Fibre	9	7	5	6	9	10
Folate	10	9	6	5	6	7
Iron	15	12	8	8	11	12
Riboflavin	9	9	7	6	8	9
Vitamin D	4	6	5	3	3	3
Zinc	5	4	3	4	6	6
Other breakfast cereals (NSP Englyst fibre <4g/100g or more)						
Age (years)	**1.5-3**	**4-10**	**11-18**	**19-64**	**65-74**	**75+**
Folate	7	9	8	3	2	5

Iron	9	9	8	3	2	5
Riboflavin	5	7	7	3	2	4
Vitamin D	13	15	13	6	3	8
Free sugars	5	4	4	2	2	3

Yogurt, fromage frais and other dairy desserts						
Age (years)	**1.5-3**	**4-10**	**11-18**	**19-64**	**65-74**	**75+**
Calcium	8	6	3	5	6	6
Iodine	8	8	4	6	6	7
Riboflavin	7	6	3	4	4	4
Vitamin D	18	11	3	3	2	3
Free sugars	12	6	3	4	5	5

Fat spreads**						
Age (years)	**1.5-3**	**4-10**	**11-18**	**19-64**	**65-74**	**75+**
Vitamin A	5	5	5	4	4	4
Vitamin D	8	9	7	7	7	8
Saturated fat	3	4	3	4	5	4

Source: National Diet and Nutrition Survey years 2016/17-2018/19 [86]
*All or some of the foods captured within this food code would typically be classified as UPF, depending on their exact ingredient list [83, 87]
**Excluding butter

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