Empirical Work Investigating Food Labelling

To examine more specifically responses to labels that communicate different features of food products, this section covers the following types of food labels:

1. Food labelling communicating sustainable consumption (for example carbon footprint labelling)
2. Nutritional labelling
3. Specific consumer groups
4. Front of pack labelling
5. Other mandated food labelling information: a) Country of origin or place of provenance and b) Additives
6. Labelling of organic food products, fair-trade, ethical food production
7. Labelling of meat-free, synthetic meat, meat substitutes, and 50/50 (half meat and half meat substitutes)

For each type of food label, we summarise the key findings of empirical studies that have considered various consumer behaviours associated with the labels, including what features of the labels may be more or less persuasive in affecting decision-making and purchasing behaviour. In the main, we aim to examine the extent to which the labels were able to inform consumer behaviour such that it changed in line with incorporating the information contained within the labels. It is important to note that the literature on food labelling is vast, but to make our evaluation of the literature manageable and most relevant, we focused on studies that examined the impact of the labels on behaviour (even if hypothetical choice), so long as they included price of food in their analyses, and/or were field studies.

Sustainable consumption

The most cited study on sustainability labels on food products (see Figure 2) is Grunert et al.'s (2014) survey and choice experiment (interviews, n = 4408) on a European sample (UK, France, Germany, Spain, Poland, Sweden). The survey examined the motivations towards sustainable consumption, their general values and goals, and self-reported use of, and understanding of different types of labels. The choice experiment looked at which products they would buy depending on manipulations of price, nutrition labelling, ethical labelling and sustainable labelling of food products (i.e. breakfast cereal, soft drink, ready meals, chocolate, ice cream, coffee).

Figure 2. Sustainable food product labels (for example Rainforest Alliance Certified logo; Carbon Trust, EU Ecolabel, Fairtrade, Animal Welfare label)

Overall, regardless of whether behaviour is self-reported, or through the choice experiment, the findings show that ethical and sustainable food labels are not used. Moreover, the choice study shows that people rely on price and nutritional information substantially more than ethical and sustainable food labels. Motivation towards sustainable consumption does not account for this finding, since across the board, concern around sustainable consumption was high, but general. That is, people reveal general attitudes which show concern around issues of ethicality and sustainability, but when it comes to what people say they attend to when making their choices, price, brand, quality, quantity, and sell by date are by far the most important factors that people practically refer to when making their choices. Findings like this pose a problem for many behavioural change frameworks, especially those that aim to target motivation as a way to then trigger behavioural change (for example COM-B).

The findings have since been replicated in further choice experiments using multiple country samples (UK, US, Germany) showing that price and nutrition are significantly more influential on food choices than ethical or sustainable attributions of the products. Additional complementary findings come from a recent ethnographic study (samples: US, Canada) by Fox et al. (2021) combining semi-structured interviews, and a pile-sorting task. This involved sorting 42 food products into piles that grouped them according to similarity, and then rated on price, taste, convenience, familiarity, health and environment. When it came to connecting the findings from the interviews and the pile-sorting task, overall there appeared to be a strong consensus on price (as a factor of importance and consensus on rating food products), where environmental impact was fairly low down the list of considerations, and there was no consensus on how to rate foods by environmental impact, which is consistent with other studies .

Take home message: Sustainable consumption labels

While people report concern regarding issues of ethicality and sustainability of food, it is clear that people trade off multiple factors against price, because price is still the most salient factor that informs people's choices. Two factors that might account for why sustainable consumption labels do not make a significant impact on choice behaviour are the following. First, there appear to be a wealth of labels that consumers are confronted with. There are green labels, eco-labels, and ethical labels, which depending on the authority referred to, either fall under the general category of sustainable consumption labels or not. The range of labels are vast (for example "eco-friendly", "environmental safety", "recyclable", "biodegradable", "ozone-friendly", "carbon-trust", "low-pesticides", "fair-trade", "animal-welfare", "organic", "free-range"). They do not all refer to the same thing, and each can have multiple associations, and different levels of relevance to a consumer . So, given the range of labels associated with sustainability, where people care to differentiate them based on their own interests, they will. However, for the vast majority, these specific labels do not connect to general attitudes, which are just that – general, and do not connect to the matter of most relevance, which is price. Second, green/ethical/sustainable products are still more expensive than non-green counterparts117, and so shifting choices towards sustainable consumption requires making structural price changes 48 . If, as has been shown consistently, consumers are oriented towards the price of food products, then once they consider alternative food products that are sustainable, then price sensitivity is likely to be the next factor that informs their choice, because they will be making comparisons with their typical habitual food choices.

Nutritional Labelling

A highly cited study by Sachs et al. (2009) examined the impact of front of pack traffic light (see Figure 3) nutritional labelling (on two product categories: ready meals, and sandwiches) on actual food purchases in a field study. The study was careful to only include food items under both categories that were not originally or during the study under promotional offers. Where price varied across products, this did not significantly impact the study, because the critical comparison

was sales of items before the presentation of front of pack traffic light nutritional labelling, and sales increase after the presentation of this labelling. Sales data from a major UK food business operator (over 1000 supermarket stores) were compared for four food products under the ready meal category, and 12 food products under the sandwiches category, with variation in nutritional value of food products across categories. The comparison took place four weeks before the introduction of the new labelling scheme, and four weeks after. The findings showed that there were no substantial changes in the selection towards healthier items based on the introduction of the front of pack traffic light labelling scheme. The value of this study is obviously its ecological validity, along with access to a high volume of data across multiple regions across the UK.

Figure 3. Nutritional labelling examples (Guideline daily amounts, Traffic light label, Nutritional facts label)

A recent field study in Australia by Neal et al. (2017, n = 1578) aimed to extend work on the impact of front of pack traffic light labelling on healthy choices. They did this by using an innovative smart phone method to compare the effects of different types of nutritional labelling on choice behaviour. First people were provided with an app on their smart phone, where for a week they used the app to scan the barcode of pre-packed food items, along with a photograph of their till receipt. This established a baseline. After this, they were randomly allocated to one of five conditions (Health Star Rating (HSR) system, multiple traffic light labels (MTL), daily intake guides (DIG), recommendations/warnings (WARN)—or control (the nutrition information panel, NIP)) [see Figure 4]. For four weeks, when they made their food purchases, people were required to scan the products via their smart phone, and depending on which condition they were in, they would receive either HSR, MTL, DIG or WARN details. The findings suggest that, consistent with Sachs et al. (2009) and a comparable field study conducted in New Zealand by Mhurchu et al. (2017) , none of the different labelling systems were shown to have any reliable impact on consumer behaviour (i.e. changes towards healthier consumption) compared to the control condition.

Figure 4. Nutritional labels used in Neal et al.'s (2017) study, Health Star Rating label (HSR), Daily Intake Guides label (DIG), Recommendations/Warnings label (WARN)

Moreover, these findings also generalise to studies that have examined the impact of front of pack traffic light labelling of nutritional details on carbonated soft drinks by Sandoval et al. (2019, n = 108) . This study was based on an Ecuadorian sample, using an intensive interview schedule where data collection on each of the 108 households was collected each month for 20 months prior to the traffic light label intervention, and 16 months after.

While there seems to be strong evidence that nutritional labels alone do not shift dietary habits in several field studies, it is worth examining in brief whether, irrespective of efficacy, which types of nutritional labels are more easily interpretable than others. Much of the work that has conducted laboratory comparisons of different labels (HSR, DIG, WARN, TLL) suggests that warning labels (see Figure 4) are more visually impactful, easier to understand (across all consumer groups), and more accurately interpreted than traffic light labels and other labelling systems (HSR, DIG) (see Figure 3)122 123 , or are equally impactful as traffic light labels . Another important factor when comparing different types of nutritional labelling systems is time available to process the labels . Systematic comparisons across a variety of nutritional labelling systems is lacking. Nevertheless, when comparing guideline daily amount with traffic light labelling systems, guideline daily amounts outperformed traffic light labelling based on the key behavioural measure, which was to interpret nutritional information so as to select food options to build a meal that was healthiest. However, this was time dependent – if people were not under time constraints, the guideline daily amount was most effective, but when time was limited, and depending on what was asked of people, both systems were equally effective, or else the traffic light system had the edge128.

Take home message: Nutritional labelling

When it comes to the use of front of pack nutritional labelling, the most common of which, at least in the UK, is the traffic light labelling system, studies consistently show that this labelling system does not appear to significantly shift consumer choices towards healthier items. Why might it be that nutritional labelling systems do not, in and of themselves, lead to substantive changes in dietary habits? Trust appears to be one consistent factor , that is, consumers can be highly suspicious of the labelling system and whether it can be depended on to provide accurate information about nutritional details, and this can have a cultural dimension to it , where the information conflicts with cultural values regarding traditional foods that form the dietary habits of consumers. Another related factor regarding the interpretability of nutritional labelling systems is that there is variation in the way the systems are understood, not only by consumers, and across countries, but also by dieticians . When compared with other factors, as has been highlighted, given the ambiguity of their interpretation, or the inconsistency of using nutritional details for decision-making, other salient factors will be much more salient, such as price , along with expiry date , and brand . Also comparing own-brand and branded products for online purchasing and

physical stores purchases reveals inconsistencies between the presentation of nutritional label designs (for example Guideline Daily Allowance (GDA) figure, Reference Index (RI%), TLL) .The study shows that for some supermarkets, 90% of the pages containing online product nutrition labels were inconsistent with in-store labelling. The inconsistencies concerning correspondence between online and in-store labelling were the colour of the labels (for example black and white, colour); as well whether all information was presented for online products compared to the full information presented on products in-store (for example TLL, GDA, RI). Five (Tesco, Sainsbury's, Waitrose, Morissons, Asda) UK supermarkets were included in the 2015 study.

Efforts to encourage consumers, especially dieters to utilise nutritional labelling systems has met with some success, but the trialled methods require the presentation of short videos, and implementing what was learnt to simulated shopping scenarios . Finally, two other factors that have been discussed that are part of the recommendation for shifting consumer choices towards healthier diets, especially for low income groups, is the introduction of sugar taxes or fat taxes , which is likely to have an impact on reducing selections of branded high calorific foods and beverages124. While it is the case that consumers are price conscious, and so 'sin taxes' might be enough to shift them away from selecting some products, there are also concerns regarding the impact on households that are financially vulnerable. Moreover, fat and sugar taxes have not been shown to significantly impact the continuing growing rates of obesity, where sales taxes might be a expected to be a better solution . One country that has tried to tackle obesity aggressively is Chile. It moved beyond the dissemination of nutritional information via labelling systems to combine this with front of pack warning labels, restricted child-directed marketing, and a ban of sales in schools of all foods and beverages containing added sugars, sodium, or saturated fats that exceed set nutrient or calorie thresholds . This has been shown to work based on a recent study by Tallie et al. (2020, n= 2383) . In short, significantly shifting consumer behaviour towards healthier dietary habits requires a series of broad and long term measures, and where nutritional labelling systems alone have been used to shift behaviour, studies consistently show that this method alone has no reliable effects.

Food labelling targeting specific consumer groups (for example allergens)

This section includes consumer groups that are especially motivated by medical reasons (specific food-allergic condition) or through lifestyle (for example vegan), to attend to food labels to inform their choices. Unlike the previous sections, this section focuses on the issues that consumers raise concerning the labels, since as self-motivated groups, it is fair to assume that they, by definition, are going to be attending to labels. Therefore, the issue here is not attentional capture to motivate changes in behaviour but rather, given that labels are attended to, how can the labelling be improved.

Medical reasons: There are two types of labelling with respect to food-allergens, precautionary and mandatory (see Figure 5). Precautionary allergen labelling (PAL), also referred to as advisory labelling, is voluntary and highlights to the consumer that one or more regulated allergens could be unintentionally (for example due to cross contamination) present in a product, and thus pose a risk to susceptible consumers (for example "may contain nuts"). For mandatory allergen labelling (MAL), as stated by the FSA , and in accordance with food law, food business are required to highlight (for example in underline and/or bold) the contents of packaged food that contain any of 14 allergens.

Figure 5. Examples of labels with different explicit claims regarding allergens.

Many of the studies available examine the impact of different types of labels containing information for food-allergic consumers, and converge on the same conclusions. The studies use a variety of techniques including surveys, interviews and ethnographic techniques where consumers are observed while in shopping environments. Food-allergen consumers report problems 145 146 . These include issues with: 1) the readability of labelling (often the text is too small, and not well contrasted), 2) the placement of the labels (for example there was no pattern to where the critical information was presented on packages), 3) confusing and contradictory information, and 4) lack of harmonisation of labelling across countries (where food imports are concerned).

Across studies there is also convergence around best practices 145 150 151 . Symbols indicating the presence of food allergens were judged helpful in making quick determinations of selection, but there is a stronger preference to have this accompanied with detailed text. Also, examples of food allergen labelling which is effective is often found in baby foods, and confectionaries. Specific details that ought to be contained regarding allergens are: 1) proportion of allergen content,(or a precautionary allergen label) 2) allergen management in the factory, 3) standardised allergen information format, 4) an allergen symbol on the front and back of packaging. Moreover, there is a willingness to use barcoding scanning systems either available at food stores or mobile phone applications where critical information is easily available to food-allergen consumers154 . Though it is clear that while there might be interest in these kinds of technologies, particularly smart phone scanners which could be personalised to the consumer, as yet no work has been conducted to examine the extent of improvement of personalised

technologies on: a) reducing exposure to negative health related incidents from food allergen consumption, b) the accuracy and efficiency of personalised applications on smart phone for food allergen consumers.

Lifestyle reasons: The most popular trending diets are gluten-free veganism, and vegetarianism . In the latter two, personal dietary choices not only reflect health reasons but also values concerning ethical practices and environmental factors.

For those that do not have health conditions, the motivation for adopting a healthier life style is the primary reason for moving to a gluten-free diet , where the other reason is having a family member or partner that has Coeliac disease, or other gluten sensitivity, and so by practical necessity, or solidarity, adopts a gluten-free diet. In addition, the gluten-free diet has received celebrity endorsement by athletes promoting health benefits. However, one concerning aspect of adopting this diet, for both coeliac and non-coeliac consumers, is that products specifically marketed as gluten-free (for example biscuits, cakes, pasta) often contain higher concentrations of salt and sugar to enhance the taste, thus making them unhealthy as a result. Thus, coeliac and non-coeliac consumers of gluten-free products are likely to attend to labels that indicate the products are gluten-free, but attend less to the nutritional contents that indicate greater levels of sugar/ salt or less protein compared to non-gluten free counterparts .

Consistent with concerns highlighted elsewhere regarding food labelling, to date the most prevailing issues with vegan food labelling are that there is no uniform definition of vegan, and no standardised labelling format (see Figure 6), and a lack of consistent transparency and prominence of labelling of vegan products .

Figure 6. Examples of vegan food labels (taken from Gerke & Janssen, 2016). N.B.

The labels vary according to four types: simple lettering, highlighted lettering, as part of the product name, as part of the brand name.165

In addition, of particular relevance to vegans and vegetarians is the fact that meat-based substitutes for meals that are typically meat-based presents a problem for how they are labelled and marketed. Consumers have a strong preference for retaining critical information that is indicative of the product for example ‘vegan/vegetarian meatballs’ rather than moving to new food product labels for example ‘protein balls’ . A key reason for this preference is that referring to products by their traditional names accompanied by “vegan” or “meat-free” is enough to indicate the likely taste, texture, and cooking methods of the product, compared with an entirely new label167. Moreover, attracting meat-eaters towards plant-based equivalent meals (either ready-meals sold in food stores, or cooked meals in restaurants) requires efforts to carefully consider labelling , where labels indicating meat-free are preferred to those explicitly indicating that they are for vegans/vegetarians .

Take home message: Specific consumer groups

As highlighted at the start of this section, specific consumer groups, either motivated by medical reasons or lifestyle, are attentive to labels that are related to their dietary choices. Therefore, the

literature that was surveyed highlighted aspects of the labels that are problematic, and where labelling could be improved. In the main, the issues are consistent with some of those highlighted in other sections, which is that labels need to be presented in ways that carry information clearly and accurately, which according to consumers, is still not the case. Definitions behind the concepts that the labels relate to need to be clarified in order to make the labels and what they mean consistent, as well as standardised across countries. There are also issues regarding nutritional content claims, particularly for products marketed at specific groups that are health conscious, where substitution of proteins or gluten often entail higher concentrations of fats, sugars and salts, which undermine or contradict the promotional front of pack health claims. Given that there may not be sufficient space to present critical information, especially for special consumer groups that have health conditions, alternative ways of sourcing information or else personalising information can be achieved via mobile phone applications, or barcode scanners in food stores.

Front of Pack labelling

Some of the literature has already been covered with respect to details about information that is summarised at the front of packagaing concerning the details of the nutritional content of food (for example traffic light labelling [TLL] indicating levels of sugar – according to the ways academic literature has examined traffic light labelling not FSA traffic light labellings systems) , and sustainable consumption (for example carbon footprint trust). Therefore, the focus here is to consider two other aspects of front of pack labelling: 1) salient informational sources (for example nutritional content claims, promotional offers, and celebrity endorsement, and 2) typically who attends to this kind of information (for example demographics). It is worth noting here that what is being reported is the way the academic literature refers to nutritional labelling and health claims, not what the specific terms mean with respect to “nutritional claims”. Therefore, it is worth clarifying what the distinction is between the two. A nutrition claim is ‘any claim that states, suggests or implies that a food has particular beneficial nutritional properties due to the energy, nutrients or other substances it contains, contains in reduced or increased proportions or does not contain’ for example ‘sugar free’ or ‘high in fibre’. Health claims are ‘any claim which states, suggests or implies that a relationship exists between a food category, a food or one of its constituents and health’.

Much of the work looking at front of pack labelling examines the impact of health claims on consumer behaviour, primarily because many of the claims are used as part of several other marketing strategies (for example promotional offers, celebrity endorsements). Direct comparisons made between the impact of front of pack nutritional labelling and health claims is limited , but of the work that has been conducted, there are a few key consistent findings. Consumers will attend more to health claims than nutritional labelling, where the health claims focus on positive aspects (for example Calcium may help improve bone density) compared with negative aspects (for example Diet rich in whole grain foods may reduce the risk of heart disease and some cancers). Consumers also find health claims more persuasive than nutritional labelling, and this does lead to behavioural change. In addition, consumers who are more health conscious (especially if they have developed particular illness, or because they want to improve their diet,) are biased towards attending to positive health claims over and above nutritional labelling. One reason offered for this is that simple statements regarding positive health claims are easier to interpret, and are generally used as as indicator of nutritional content . More specifically, regardless of the healthiness of the product’s specific nutrient profile (for example sugar content, salt content), a general health claim is prioritised over inspecting the specific nutritional profile of the food product. This is also consistent with work examining the effects of allergen labelling on consumer choices, which shows that where it does influence consumers, labels such as “gluten free” are treated as indicating the healthfulness of the product, ignoring the fact that the same product may in fact be high in sugar and salt to increase its taste, making it less, rather than more healthy. This section examines evidence that concerns the different types of labels that appear on

the front of packaging of food, in order to determine which types of labels have the most impact on consumer behaviour.

Salient front of pack information: A well regarded and cited empirical study by Dixon et al. (2014) examined different types of front of pack marketing information and the potential influence on pre-adolescent children's choices. They looked at three common forms of front-of-pack promotions: health and nutritional claims (for example "high fibre" or "rich in omega 3"), health claims (for example "calcium helps improve bone density"), premium offers (for example buy one get one free), and celebrity endorsements (for example containing pictures of celebrities either picture holding or consuming the product). Children were asked to indicate their preferred choice from two comparable child-orientated food products; one of which had a healthier nutritional profile than the equivalent promoted alternative. Dixon found that, compared to the control condition (no promotion), children were significantly more likely to prefer the unhealthier food option containing energy-dense and nutrient-poor qualities which were found in the nutrient content claims condition and the celebrity endorsement condition. However, children who viewed the products with the Nutrition Information Panel (NIP) had more realistic perceptions of the healthfulness of the products, but viewing the NIP was not sufficient to weaken preferences for on-pack promotions. The same findings have been replicated in adult consumer samples2 , and through analysis of a variety of different food categories assessing disparities between nutritional content claims, promotional offers, and endorsements to actual nutritional scoring of the products181 186.

For example, bread and breakfast cereals are two food product categories that have received considerable attention when examining front of pack content claims (for example 'no artificial colours or flavouring', 'preservative free', 'nutritious', 'Good source of fibre') . Of particular interest are health claims as well as nutritional labelling on breakfast cereals targeted at children . Much of the work examining bread and breakfast cereals converges on the conclusion that health claims and nutritional content claims overstate the actual healthfulness of products, such as breakfast cereals, though at least one study conflicts with this174; the reason for this inconsistency might be country specific, where manufacturers are more compliant with regulations in some countries, though empirical work is needed to support this speculation. In addition, products such as breakfast cereals and drinks that are not permitted to be sold to children because of their nutritional scores , are nonetheless targeted at children because they contain attractive messaging of interest to children (for example the contents include toys/stickers, or are celebrity endorsed). Combined with empirical evidence showing the strong persuasive impact of promotional offers, nutritional content claims and celebrity endorsements on front of packing, researchers investigating deviations of claims from actual nutritional facts indicate their concerns , especially since these labels appear to be the most reliable in influencing consumer choice behaviour when compared to official nutritional labelling. The key point here, as highlighted at the start of this section is that certain types of labels that appear on the front of packaging can be highly influential on consumer behaviour, but not necessarily in ways that benefit consumers. This is because the types of salient information that is used to influence consumer purchases (for example health claims, promotional offers, celebrity endorsement) often results in increases in purchasing of unhealthy food products.

Eye-tracking studies: One line of research worth mentioning here is the use of eye-tracking methods to determine which aspects of the front of packaging consumers orientate their attention towards. These types of studies have been conducted in the laboratory as well as in the field (i.e in shopping stores where customers wear eye tracking head gear while shopping) , or simulated shopping environments . Three general conclusions can be drawn from this work. First, as mentioned earlier in this report, the habitual nature of food shopping means that people spend very brief amounts of time attending to labels (for example average referred to by Machin et al., 2020 – 6.9 seconds)189. Second, consumers tend to prioritise what they attend to (for example price, brand), which reflects their need to introduce efficiencies into their shopping behaviours. The third is, even if attention is directed towards labels that contain information regarding

nutritional content, this is no guarantee that the product will be selected. However, in general, the longer people attend to labels on a food package, the more likely they will end up selecting the product, so long as it is also within a particular price range.

Demographic characteristics: There is a substantial amount of work reporting that gender, marital status, socio-economic background, education level and general nutritional knowledge predict attention paid to front of pack and back of pack food labels .

To address some of the sampling issues of previous studies, a recent survey by Bryla (2020) based on a robust representative sampling (n= 1051) method examined the demographics of those that attend to front of pack and back of pack food labels. The survey was carried out online, where participants were invited to report on food items they purchase with questions referring to information that is either present on the front of pack or back of pack of food packaging . None of the typical demographic characteristics were found to predict attention for front of pack and back of pack labels, but rather knowledge about a healthy diet, the level of importance attached to health claims, and fat content of food items did.

These findings are aligned with ethnographic work which suggests that the highest level of consensus is towards attending to price and quality of food items, with no clear characteristics of shoppers predicting attendance to labels related to health or sustainability115. The findings also align with earlier cross comparison work of preferences towards different types of front of pack nutritional labels conducted on European citizens . Moreover, consistent with previous work reviewed here, food labelling alone, even when attended to, was not shown to be sufficient to determine the adoption of healthy diets.

FOP labelling targeting demographics: While it is worth understanding who typically attends to FOP and BOP labelling (particularly nutritional labelling), it is also worth considering some of the literature that has examined the way in which FOP labelling is designed to target specific groups176 (for example age groups, ethnic groups). In the latter case, targeting of ethnic groups is often achieved through endorsement of celebrities of ethnic backgrounds that are the same of the target group. As with findings presented earlier in this section regarding front of pack labelling that target children, the work presented here suggests that there are concerns about targeting specific ethnic groups. In the main, this is because the use of celebrity endorsements that are from the same ethnic group that is being targeted promote food products that are not necessarily healthy. Moreover, there is special concern that FOP labelling (for example celebrity endorsements, nutrient content claims, promotional offers) combined with digital marketing targeted at children is contributing to a rise in childhood obesity . Finally, there is work showing that when looking at the interpretability of FOP labels of food products in the UK, older adults (over 65-year old), people with lower levels of education, and those from lower social classes are less likely to be able to accurately interpret the labels. Minority ethnic groups also have difficulty in interpreting them .

Take home message – Front of pack labelling

Concerns are raised in work examining the saliency of promotional offers, nutritional claims and health claims, and celebrity endorsements because of their highly persuasive nature. The reason is that where many of these mechanisms are combined, the negative impact on consumer choices is greater because these mechanisms are applied to products overstating healthfulness. Concerning still is the use of salient front of pack information that targets children, where again, the products themselves are not especially nutritional, but nonetheless are attractive to children, adolescents, and adults that are making purchases on behalf of their family.

The most robust work to date suggests that there are no clear demographic factors that predict attention directed towards either front of pack or back of pack food labels. The most reliable predictors are based on general interest towards and knowledge of health and nutrition. In

general, work looking at front of pack labelling that targets specific groups suggests that there is sufficient attentional capture to motivate consumers (children, adolescents, adults) to purchase food products targeted at them. Often several factors combine to achieve this, including promotional offers, brand names, along with celebrity endorsement. In other words, the effectiveness of these types of labelling methods is because they match precisely with the factors that consumers prioritise the most when making their purchases – price, quality and value for money.

Country of Origin labelling

Figure 7. Examples of country of origin labels

When considering the effect of country of origin labels (CoOL), it is first important to define what exactly is meant by the term. Whilst straightforwardly defined for single, unprocessed products such as chicken, for processed or composite products, the term can either refer to the origin of the product (for instance, country of birth, rearing or slaughter), or the country where the ‘last substantial change’ occurred . Notably, research has shown relatively low levels of consumer understanding for the term , which should be borne in mind when considering the extent to which CoO labelling influences consumer behaviour – even if effects are found, these may be based on misunderstandings of the label.

Balcombe et al. (2016) selected a range of 12 meat products (for example, chicken breast fillets, bacon, beef lasagne), which differed on five attributes: price, CoO (UK, specific EU country,

generic EU option or specific non-EU country, either presented in text, or with text plus flag), product quality (basic, choice or premium), farming system (organic or conventional) and quality assurance (no label, Freedom Food or International Quality label). Using a discrete choice experiment, UK participants were asked to choose between two product options, which varied on the five attributes. Results indicated a strong home country bias, with the UK CoO products always the most preferred, followed by the specific EU country. Participants were willing to pay more for UK products and required significant price discounts to consider non-UK products. However, the CoO was not the most valued attribute for the majority of the products, indicating the effects of CoOL may be limited to particular types of products, such as fresh/frozen meat rather than processed products. Whilst participants preferred the text and flag CoO format, this did not appear to influence choice, with similar levels of willingness to pay (WTP) seen for both formats.

More generally, results of research investigating the effects of CoO labelling are mixed , likely due to the diverse set of products and participants featured, as well as the variation in outcome variables measured – such as attitudes, evaluations, perceptions, preferences, WTP, purchasing intentions/behaviour . Greater effects are observed when 'perceived quality' is measured versus attitudes or purchase intentions . Generally, studies find that domestic food is perceived more positively than foreign food , which may be due to the belief that the former is safer and of higher quality . These beliefs are reflected in studies of consumer preferences – consumers prefer food products from their home country and are willing to pay more for such products . Its effects also vary according to product type and complexity = stronger effects are seen for high involvement, high risk products versus less 'everyday' than low involvement products such as coffee and bread . There is however, limited research on the effects of CoOL on purchase intentions and behaviour – that which has been conducted has typically concluded CoO evaluations have "little or no direct influence on purchase intentions" (p.39).

Moreover, the effects that are observed may not even be directly attributable to the information contained on the label per se, but rather what it represents to consumers conceptually. CoO information is suggested to be used as a proxy for other information important to consumers, most typically product quality , but also other factors such as food safety and traceability , .

Take home message – Country of origin

Research considering CoO effects conclude it is not a particularly important extrinsic cue for decision making , findings which are echoed in studies concerning food CoOL. The relative impact of CoOL appears to depend on the presence of other attribute information and quality cues, such as price and brand name . For instance, effects of CoOL are (inevitably) greater when CoO is the only attribute presented for a product , , , which of course is not reminiscent of real life. Although over half of consumers (62%) reported looking at the information when making a purchasing decision, only 3.5% cited it as a reason for their choice . Instead, price and quality are perceived by consumers to be more important .

Additives labelling

Additives can be defined as ingredients which are added to food in order to fulfil a particular function and are typically grouped according to this function, for instance ‘preservatives’ refer to additives that are used to keep food safer for longer . The majority of research on additives has focused on consumer understanding and perceptions, rather than behaviour change following information provision via labelling. Often studies find that food additive labels are perceived as informationally inadequate or difficult to comprehend . Studies have also found relatively low levels of knowledge regarding the differences between various flavourings (as defined by regulators), which indicates that the presence of a label does not necessarily mean the label will be understood in the correct way, and thus have the desired or intended effect.

Food additives are typically perceived as unnatural, unhealthy, frequently met with scepticism and distrust and as such, consumers often seek to avoid them . If foods without additives are not available, consumers choose those with natural additives over artificial additives . Research specifically investigating ‘additive free’ labels and their effects have focused on consumer perceptions, with products labelled as ‘additive free’ typically perceived positively and associated with lower safety concerns . The format of the label (whether the additive is presented as an e-number or description) has been found to influence consumer perceptions. The same product was perceived as less natural when it was labelled with a food additive listed as an e-number (for example E330) versus one described with its chemical name (for example citric acid) . However,

there might be a tipping point following the complexity of the chemical name, with greater risk perceptions for additives which were harder to pronounce .

Research considering decision-making in relation to additives has typically featured more general labels such as ‘free-from’, ‘X free’, ‘no X added’, ‘natural’ or ‘clean labels’. Findings from these studies are mixed and have demonstrated the influence of additional factors (other than label) on decision-making, such as knowledge and product type. Consumers who showed an awareness of food additives were willing to pay more for a wine which was labelled as ‘antioxidant free’ though the opposite pattern occurred for those who were knowledgeable about wine . The presence of ‘all natural’ labels increased purchase likelihood, but this effect differed across food categories, with increased purchase intentions for products such as cheese and milk, and lower purchase intentions for products such as pork . For those who believed the ‘all natural’ label was associated with no preservatives, the products were also perceived to be better tasting, more nutritious and safer, which increased intended likelihood of purchase.

Findings from research on clean labels can also indirectly inform our understanding of the effect of additive labels. The term ‘clean label’ is not well defined, but is typically understood as referring to product labels which do not have negatively perceived ingredients in the list, such as artificial or chemical sounding additives . Again, however, this research is mixed – although clean label products (described as ‘All natural, organic, GMO, free from artificial preservatives and colours’) are perceived as more nutritious, healthier and safer, these perceptions do not always translate into increased WTP for such a product . Whilst some studies have indicated participants would pay a premium for such clean labelled products, this preference differed across different demographic groups and thus cannot be said to be consistent. For instance, those with lower incomes are less WTP for such products.

Take home message – additives

Much of the psychological research on additive labelling has focused on consumer perceptions, acceptance and risk perceptions. That which has examined decision-making has primarily used laboratory WTP tasks, which do not provide strong support for the notion that additive labelling induces behaviour change in the real world. Indeed, despite the fact that food additives have been present, scientifically tested and regulated for a long time (relative to more novel technologies), there still exists the belief that they do not belong in food – the ‘paradox of e-numbers’ . The fact that such distrust regarding additives still remains despite such prolonged regulation suggest that labelling does not always lead to habituation . The proliferation of ‘clean labelling’ means that the issue of trust is likely to become even more prominent for consumers in the future, given the labelling of such products is currently not regulated.

Labelling of organic food products

Figure 9. Examples of organic labels from the a) Soil Association b) Organic Farmers & Growers CIC and c) European Union

The majority of research focusing on the effects of organic labels has focused on two questions – how are food products labelled as organic perceived by consumers and how much are consumers willing to pay for such products? Generally, organic labelled food products are perceived positively – the ‘organic halo effect’. They are perceived as healthier, more nutritious and more environmentally friendly, with such benefits extending to improved taste perceptions and perceived safety of consumption . It is therefore unsurprising that such positive perceptions translate into increased WTP for organically labelled products, consistently found in a range of samples . However, the effect of the label does appear to depend on contextual factors, such as: the type of product (how processed it is, whether it is a vice or virtue product) , brand equity and the format of the label/its description. More positive perceptions are observed for certification logos versus a generic organic logo , with increased WTP for certified organic labels , , attributed to increased levels of trust. Higher preferences for organic food were observed when a jam was described as ‘100% organic’ versus ‘95% organic’ or ‘with organic blueberry’ . However, the presence of an organic label does not always equate to increased purchase intentions . Studies in the US comparing USDA organic labelled products versus one where this label was absent revealed no difference in the likelihood of purchase and crucially, an expectation that organic products cost more .

Whilst useful, results from such experiments on perceptions and WTP cannot be said to demonstrate substantive evidence of behaviour change, for a number of reasons. The first reason relates to the methodology of such studies – typically, studies pick one or two products, simplify their packaging and vary the presence or absence of an organic label. In reality, consumers will have further attributes to base their decision on, including brand, packaging and price promotions. Secondly, the majority of studies have taken place within the laboratory, where likelihood of purchase decisions are far removed from real-world contexts in which factors such as price are far more important for organic purchase intentions . They also ignore consumer reliance on other information sources such as the internet and word of mouth when making purchasing decisions .

Perhaps the biggest limitation for the claim that organic labels substantially influence behaviour is the literature examining understanding of such labels. Studies consistently find that knowledge about organic labelling and certification standards is low, with little awareness of monitoring/inspection systems or of how labels differ from each other in terms of the standards required . For instance, although the USDA organic logo requires 95% of ingredients to be organic, perceived average content was far lower . A common finding in the literature is that the terms ‘natural’ and ‘organic’ are confused and assumed to be equivalent, with overestimation of standards perceived for the natural label , with such confusion influencing food purchasing behaviour , increasing purchases of ‘natural’ products. Studies featuring UK participants have consistently found low levels of recognition for European Union and Organic Farmers & Growers organic labels, with the highest levels of recognition were found for the Soil Association logo . Many of the sustainability labels such as the Red Tractor and Fairtrade are mistakenly perceived as organic . Given the diversity in understanding of such labels, it becomes near impossible to claim that any effects on behaviour change are specifically due to these labels.

Take home message - Labelling of organic food products

Even if one overlooks the fact that organic labels are commonly misunderstood, there is little evidence that consumers pay much attention to them, or actually use them when choosing products. An eye-tracking study of nine different products with organic and regional labels found that the label was not the most attended to zone for any of the products. For the majority of products, the brand received the most amount of attention . In addition, a lack of trust in the label and government regulations often means that consumers use other proxies, such as taste, texture and freshness when making purchasing decisions . Given that organic products are credence goods, whereby customers cannot verify the attribute even after purchase or the

consumption of the food , the issue of trust in the label is paramount . Even if the label is present, there is no guarantee it will be trusted and thus used in decision-making. Coupled with the fact that over half of consumers buy no, or proportionally very little organic food and show generally low levels of interest in and low use of organic labels , it does not seem that organic labelling is an overly effective technique for inducing behaviour change.

Labelling of meat alternatives

Figure 10. Examples of meat alternative labels.

Psychological research on meat alternatives has grown over the last five years, though remains considerably less researched than the other topics considered in this review (for example nutrition, ecolabelling). The majority of studies have focused on consumer acceptance and perceptions of such products, primarily focusing on differences between terminology such as ‘meat-free’, ‘synthetic meat’, ‘clean meat’, ‘lab-grown meat’, rather than focusing on choices for specifically labelled products . Research consistently finds that meat-alternatives are perceived negatively , with terms such as ‘cultured meat’ or ‘in-vitro meat’ met with disgust and perceived as unnatural . When studies have compared more traditional labels, such as ‘vegan’, ‘plant based’ and ‘meatless’, ‘plant-based’ is typically more positively perceived than ‘vegan’ .

Some studies have explored WTP for meat alternatives. One (non-peer reviewed) study compared WTP for cell-based products described either as ‘clean meat’, ‘meat 2.0’, ‘pure meat’, ‘safe meat’ and ‘cultured meat’, and found the highest WTP for ‘clean meat’ . Positive associations for the term ‘clean meat’ have been replicated , with the term also associated with increased behavioural intentions, such as willingness to try, or buy the product regularly, as well as eating it instead of conventional or soy-based meat . However, in experiments comparing meat alternatives with conventionally produced meat, meat alternatives still remain unpopular choices

. Terminology such as ‘meat-free’ has consistently been noted to discourage consumers from choosing vegetarian products . Notably, choices for such products were highly sensitive to price and brand information . Indeed, attributes such as affordability remain a strong influence of purchase intentions for meat-alternatives.

Take home message – labelling of meat alternatives

Despite the lack of research measuring consumer choice, it seems reasonable to suggest that, as has been identified in previous sections, that labelling of meat alternatives is unlikely to induce substantial behaviour change, with factors such as price, brand and quality far more important to consumers. The former factor is likely to be a particular limitation for the success of meat alternative labelling, given that such products are typically more expensive . Furthermore, given that vegetarians and vegans represent a significant proportion of consumers of meat alternatives, and deliberately do not eat meat often for ethical reasons , trust in the label and associated regulation is likely to be central to decision-making regarding meat alternatives.