Food information presentation: consumer preferences when eating out

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Abstract:

Purpose;

Advances have been made in the provision of nutritional and ingredient information on packaged food, however there is a need to translate this to eating out reflecting consumer desire for greater transparency and knowledge of menu content. The aim of this study is to assess consumer's preferences for food information presentation in four European countries (UK, Greece, Denmark, and France) in a workplace dining setting.

Design;

This study focuses on work-place canteens since the regularity in which they are used provides an important context and potential for behaviour change. An exploratory phase designed iteratively in collaboration with experts, end-users and researchers (qualitative) informed a survey (quantitative) conducted in four European countries. The survey was used to examine workplace diners' preferences towards food information presentation.

Findings;

Differences were found and clustered (n=5) to 'Heuristic Processors' (33%) 'Brand orientated' (25%) 'Systematic Processors' (17.3%) 'Independent Processors' (16.1%) and 'Tech-savvy' (8.6%). Dual process theories were used to analyse the findings and produce new insight into how menu information can be most effectively delivered.

Originality;

When eating out consumers struggle to make choices or make the wrong choice from a health perspective, partly caused by a lack of nutrient profile information as well as other criteria of concern. Giving catering managers the understanding of preferred communication channels can enable a more competitive operator. Traffic light labelling was the optimal presentation with the opportunity for consumers to discover more detailed information if desired. For the first time this research has given operational clarity whilst allowing food providers to be considered as part of corporate health.

Key Words: Food Labelling; Information Processing; Foodservice; Healthy Eating

1. Introduction

Eating out has become an integral part of modern life for many people with one in six meals consumed out of home in restaurants, cafés or public food settings such as workplace canteens

(Bray and Hartwell, 2017). However, compared to meals prepared at home, the consumer often has very little control or knowledge of the ingredients, their provenance or nutrient profile. In fact, food consumed outside the home is typically of poorer nutritional quality and served in larger portions (Sinclair et al., 2014). There is a positive association between the rise in eating out, higher energy intakes and increasing rates of obesity, a major health and wellbeing societal challenge in many Western nations (Kim et al., 2014). This is of particular importance in the context of the workplace where the contribution of meal served could be an important element of the overall diet due to the frequency of use with many canteens being visited for daily main meal consumption (Mintel, 2017). Public food settings particularly are environments where there is an increased offer (availability), placement and promotion (accessibility) of unhealthy calorie-dense food and beverages (Evenhuis et al., 2018).

A key approach to addressing this nutrition-related public health issue is the provision of information as a means for encouraging consumers to make healthful dietary choices (Alexander et al., 2010). However, this data is not always evident in 'eating out' settings and hence forms the research focus for this paper. In the context of foodservice providers such as workplace canteens, posting calories on menus and menu boards and providing other nutrient information is seen as a way to fill this critical information gap and enable a healthier workforce. However, significant debate exists amongst stakeholders as to the best way of providing such information. Fernandes et al. (2016) contest that the term menu labelling can be confusing in itself, where some authors employ it to denote calorie information while others use it in the broader sense to designate 'healthfulness'. For the purpose of this paper, food information will encompass nutrient and ingredient detail and any health description such as utilising symbols. Notwithstanding definitions, the primary aim of menu labelling should be to provide consumers with information that allows them to make informed choices. This would, at the very least, support consumers' rights to know what ingredients are in their dishes. A secondary aim of menu labelling should be to promote healthy eating, since it not only encourages the reduction and prevention of obesity and other chronic diseases but also promotes good health (Fernandes et al., 2016).

A review by Seenivasan and Thomas (2016) of studies that focus on the effectiveness of nutrition labelling schemes in supporting more healthful meal choices in restaurants indicates mixed results. While authors have considered the information consumers would like to receive (e.g. Price et al., 2016), others have highlighted limitations in its accessibility (Mai, 2013). Therefore, the issue may, in part, be due to presentation format which is not always audience friendly (Soederberg Miller, 2014).

In this respect, it has been suggested that current understanding of consumer perspectives is insufficient (Kleef and Dagevos, 2015), and a void remains in research which examines the impacts of different nutrition information formats on consumers' attitudes and dining intention (Sun, 2013).

1.1. Study Objectives

This study assesses consumer's preferences for food information presentation in four European countries (UK, Greece, Denmark, and France) in a workplace dining setting. A segmentation approach is adopted to differentiate between consumers with distinct information format preferences and a range of socio-demographic characteristics. Dual process theories, such as the Heuristic Systematic Model (Chaiken, 1980), are employed as a theoretical frame to provide insight into information processing styles that correspond with preferences for distinct ways of delivering food information. Findings are of interest to foodservice managers and consumer behaviour academics with particular focus on information processing.

2. Literature Review

2.1. Information provision and consumer impact

Eating away from home is increasingly being used for daily main meal consumption (Seenivasan and Thomas, 2016), and workplace dining can be a significant environment in influencing the promotion of a healthy diet (Ni Mhurchu et al., 2010). A vibrant economy depends on a healthy population. Without this, employers lose out on worker productivity and citizens are deprived of potential longevity and quality of life (Zwetsloot et al., 2010); hence the workplace is in a unique position to have an impact on society. Beyond this, canteens supply meals for a regular clientele, which could have implications for consistent exposure to nutrient information and lead to a learning effect (Bollinger et al., 2011), resulting in improved nutrition knowledge. A healthy and vital workforce is an asset to any organisation and initiatives within this environment reflect health promotion strategies advocated by the World Health Organisation (2004), furthermore health and well-being at work are crucial elements of the overall EU 2020 strategy for growth, competitiveness and sustainable development.

Effective menu labelling has been proposed as a means to influence employees' consumption of less healthful foods by enabling them to make better-informed decisions and healthier choices (European Union, 2011). There has been a marked increase in the amount of information provided to consumers (Grunert et al., 2012), where Regulation within Europe, (EU No 1169/2011) has required the labelling of the presence of 14 allergens for pre-packaged food and catered food

(European Union, 2011). The 2010 Patient Protection and Affordable Care Act, in the USA goes further, requiring nutritional information to be posted in many restaurants and fast food places (Gregory et al., 2014). A similar requirement is being debated in Ireland (FSAI, 2016).

Despite the increased presence of information and many studies that seek to determine the effectiveness of labelling in promoting healthier food choices, there is a lack of consensus on the outcome of these efforts in eating out. In their review, Seenivasan and Thomas (2016) note that while some studies report a modest drop in the caloric value of food purchased per transaction after menu labelling (Krieger et al., 2013), others observe no impact on purchase behaviour (Vyth et al., 2011), although it is suggested that consumers found the information valuable and appreciated its presence (Parikh and Behnke, 2015). Given the societal importance of healthy eating and the inconsistency between previous studies, there is a clear need for further investigation in this area.

2.2. Dual Process Theory

Food consumer behaviour is highly complex with many external and internal influences on perception, attitude and action. Product attributes, characteristics of the consumer and the eating environment all play key roles in food-related decisions. In respect of nutrition labelling schemes out of home, there is lack of understanding of consumer data processing, and preferred format (Kleef and Dagevos, 2015). Dietary habits and food choices are the result of decisions and actions that are based on both routines that require very little active decision-making and reflective, elaborate decision- making where choice options are carefully considered (Skov et al, 2013). While the extant literature provides evidence of the importance of menu information, studies assessing type and format remain limited (Price et al., 2016). Central to this are the information processing theories which provide insight into psychological tracking and underlying ways in which consumers make information judgments and other choices (Lachman et al., 1979). Specifically, the dual-process theories of information processing, such as Heuristic-Systematic Model (Chaiken, 1980), suggest that people attend to information in one of two distinct systems (Kahneman, 2011). 'System 1', is characterised by fast and automatic thinking, which uses heuristics or gut feelings to arrive at decisions without deliberation. These consumers would respond to high directedness of labels such as quality assurance labels. 'System 2', implies slow and careful processing which involves logic, and attentive consideration, to arrive at an optimal decision given the resources (Kahneman, 2011). These consumers would respond to low directedness and detailed information. Consumer behaviour and information processing conceptual models posit that communication and information efforts, if being attended to and properly processed, move individuals through a sequence of hierarchical stages, often referred to as a "hierarchy of effects". This concept indicates the different mental

stages that consumers go through after being exposed to information and when responding and making choice decisions. It is generally accepted that a structure includes a cognitive response (learning, knowing), an affective response relating to attitude formation (thinking, feeling) and (ultimately) a behavioural response (intending, doing), the sequence and separation of these hierarchical steps depends on person-related, product-related and situational factors (Thaler and Sunstein, 2008).

Despite early economic assumptions of decisions being guided in a systematic manner, evidence accumulated over the past few decades in areas of behavioural economics, social psychology and neuroscience suggest that much of human behaviour is governed by heuristic system thinking (Cohen and Babey, 2012). This includes food in general, and out-of-home eating settings where decisions tend to be spontaneous, rapid, and influenced by heuristic cues (Cohen and Babey, 2012). Due to bounded rationality (Simon, 1956), people use mental short-cuts to free up cognitive resources. Another determining criterion is the level of involvement (Chaiken, 1980), which leads to heuristic processing when low. In the context of food decisions taken in a workplace canteen, one might suggest this strategy is likely to dominate as it is a behaviour performed routinely, with low involvement, lack of time, and overloaded cognitive resources (e.g. thinking of work related tasks and a busy social setting with numerous stimuli competing for attention). Under other conditions, such as when attempting to eat more healthfully after an indulgent holiday period for example, individuals may be more motivated or involved, and in consequence switch to systematic processing.

These dual process theories have been influential in the field of attitude change and persuasion, involving multiple applications in the context of public health and behaviour change (Thorgeirsson and Kawachi, 2013) including labelling on packaged goods (Muller and Prevost, 2016). A recent review (Sanjari et al., 2017) acknowledges that the effectiveness of label formats are influenced by the consumers' dominant processing system which in addition is a function of the specific dining context.

2.3. Nutrition Labelling

There is evidence to suggest that consumers are increasingly demanding greater nutritional and ingredient information (JungJin and Cranage, 2010), providing a clear challenge for operators to deliver this in a meaningful and comprehensible manner. Van Rijswijk and Frewer (2012) highlight that to be effective, information must be concise and simple, and Mazurkiewicz-Pizło and Pachuca-Smulska (2012) similarly support the need for information to not only be reliable, accurate and complete, but importantly communicated in a clear manner. Grunert and Wills (2007) suggest that

consumers require three key things from labels; they must be simple to use, include underlying nutritional information and not be unduly coercive.

Within the EU the most commonly adopted formats used to communicate the nutritional content and relative healthfulness of foods are summarised in table 1. These formats range from detailed numerical description of nutrients in a table format (low directedness) to logos which indicate quality criteria (high directedness). Each is associated with different levels of 'directedness' and amount of processing effort, cost and involvement required of consumers. Whilst some provide extensive information and could be perceived as complicated and providing an overload of information; others, present a quick indication which enable rapid processing, but may leave questions about nutrient detail. Such an example could be brands which can be seen as an information collecting tool, influenced by consumers' experiences with the brand, associations made from communications they received from the brand or social experience of the brand (Van Osselaer and Janiszewski 2001). These associations can range from making assumptions about taste, quality (nutrition) to the origin of products (Elangeswaran and Ragel 2014).

Insert table 1 here

Muller and Prevost (2016) differentiate between labelling schemes such as Guideline Daily Amount, Traffic Light and Key Hole system (a health logo format) based on symbol type (chromatic versus numerical), granularity (aggregated versus multi-entry), and baseline (daily diet, family of products or absolute number of key nutrients per product). While the issue is complex, they propose that simpler formats such as colours, fewer symbols and nutritional facts should be easier to process than more complex tables of data due to cognitive limitations and pressures involved in processing. Deciding on these formats is critical as they have implications for the cognitive processing required from a consumer and ultimately their effectiveness in influencing behaviour.

It is accepted that several inferences exist in the implementation of nutritional information on the menu; it could be expensive, time-consuming and logistically difficult (Price et al. 2017). From a communication perspective, complexity flows from the difficulty of representing complex information without leading to 'visual clutter' (Josiam and Foster, 2009). Crosetto et al. (2016) suggest that the Traffic Light format may be more beneficial for situations in which heuristic and intuitive side of human nature dominates, and Guideline Daily Amount suits systematic processors better.

Previous studies have identified the type of information consumers would like to receive (Price et al., 2016), which imposes a significant challenge to providers to make varied and detailed information available in a way that enables consumers to process and comprehend it in a timely manner. Even if two consumers wish to receive the same information, they may be dissatisfied by the way it is provided (Nocella et al., 2014). This emphasises the necessity to explore how the information can be conveyed optimally to have a desired effect.

It is clear that consumers are increasingly demanding more information and transparency about the food they consume. Initiatives are starting to provide for this; however research into the impact of enhanced food information on choice has reported mixed results. Existing literature has not sufficiently examined how consumers process the message, or assessed the most effective format. By examining food labelling through a consumer information processing lens (Heuristic Systematic model) new understanding can be developed into the most effective use of directive and non-directive food messaging when eating out. This in itself will give operational clarity whilst allowing food providers to be considered as part of corporate health.

3. Methods

An exploratory collaboration with experts, end-users and researchers, thereby balancing scientific and practical considerations was used to inform a deductive multi-country survey (June and July 2015). The population was defined as employees who use the canteen at their place of work regularly, at least twice a week, in four European countries (UK, Greece, Denmark, and France). There is a North/South gradient in Europe with a higher understanding of nutritional labelling found in UK and Denmark, and more limited understanding in France and Greece. An abductive process was used in the study design, where the inductive results of the focus groups served as inputs to the deductive survey. More specifically, the study adopts a sequential transformative mixed-method approach (Creswell et al., 2003).This is in line with the idea that qualitative findings can inform the hypotheses to guide the empirical analysis.

3.1. Exploratory phase – Focus Group discussions

Focused group discussions (n=8) were conducted with employees in UK, Greece, Denmark and France (2 focus groups in each) recruited by the key researcher in each country. Participants were

sampled using convenience sampling through the contacts who were working in companies where a canteen for staff use was provided. One of the inclusion criteria for taking part in the focus groups was that participants had to eat regularly at their place of work which was defined as twice per week or more. .All groups were convened in the place of employment, moderated by a native speaker and lasted approximately 60 minutes. A cross-national approach was adopted to reflect cultural perspectives to preferred formats of food information, extend applicability of findings, and assess whether any differences in views may provide some explanation of the inconsistency of previous study findings.

The study and questions were agreed by the local Ethics Committees of each country. Forty participants took part, twenty-nine females and eleven males, with an age range of 22-64 years. A common discussion guide was used to ensure continuity across all focus groups. Questioning focused on food information formats, and was informed by the literature (Table 1). The purpose of this study was to validate whether previous studies have identified and examined all key formats relevant to consumers, and that the subsequent quantitative data collection instrument was comprehensive and grounded in respondents' vocabulary ensuring consistent and accurate understanding. The emanating data were used to inform the design of the empirical study, where different forms of information presentation were used as experimental variables.

3.2. Empirical study - Survey

Best-worst scaling is developed from the random utility theory proposed by McFadden (1980), who posits that a preference for one object over another is a function of the relative frequency in which this object has been chosen over the other. A key strength of using best-worst scaling is that it provides information about the top and bottom rated object in each choice set giving more information about the rating of objects in each set. As the most and least preferred option is selected by respondents, this method does not suffer from the scale bias associated with rating based scales (Loose and Lockshin, 2013). Therefore, it is particularly beneficial in cross-national research as undertaken here where previous research has found that participants from different countries make different use of verbal rating scales, and consistent interpretation of rating scales is unlikely (Baumgartner and Steenkamp, 2001). The technique has already been used and validated in the context of food labelling (de-Magistris et al. 2017).

The survey questionnaire comprised two parts: firstly; food information formats, derived from the literature and exploratory phase, representing both the heuristic and systematic communication

approaches were subjected to a best-worst scaling experiment. Secondly, socio-demographic characteristics (Sinclair et al., 2014) were gathered to assess their influence on dish choice. The best-worst experiment presented respondents with the six formats of messaging identified by the literature and validated in the focus groups (see Table 1). Each attribute appeared alongside each other option and is shown a total of three times across all choice sets. Respondents selected their most and least preferred option in each set.

To control for possible ordering effects and context bias, 10 different versions of the survey questionnaire were generated and administered randomly (Furlan and Turner, 2014).

3.3 Sampling and data collection

Email invitations were sent out to various employers in the four countries who offer workplace canteens, asking them to distribute the survey to their employees through their intranet. Participants received e-mail invitations to take part in the survey. The questionnaire was developed in English, translated into Greek and French by native speakers, and back translated to check accuracy and consistency of understanding between each country. In Denmark, the English version of the questionnaire was distributed since this was the working language of the employees sampled.

3.4 Analysis

A two-step data analysis process was used (Sawtooth Software); information format preference was calculated on an individual level and per country. Hierarchical Bayes (HB) application of a multinomial logit model was applied to estimate individual level utility scores. In order to compare format preference per country, a rescaling approach was used, where raw HB logit scaled scores were directly related to probabilities of choice with overall scores summing to 100 (Orme, 2009). The individual level raw best-worst data was subject to latent class cluster analysis using Latent Gold 3.0. Latent class analysis was adopted to identify relationships between observed variables on the basis of a smaller number of latent variables (Rindskopf, 2009). The best-worst utility scores were subject to latent class analysis to detect the preferred information format when making food choices. Latent class analysis can identify homogenous sub-groups of the sample population in respect to consumer preferences shown towards the tested attributes (Casini and Corsi, 2008). Moreover, latent class analysis is robust to different scale types, which allows clustering of individual choice data in association with socio-demographic data without changing the format of this data. In contrast to traditional cluster analysis, latent class cluster analysis, does not assume that the data is

normally distributed and linear (Chrysochou et al., 2012). Latent class analysis allows cross-country segments to be analysed rather than merely using each country as segments (Lockshin and Cohen, 2011). The general latent class segmentation model is as presented in Equation 1:

$$f(Y_{nj}|\varnothing) = \sum_{(S=1)}^{S} \prod_{S} fs(Y_{nj}|\varphi_s) \text{ with } \sum_{(S=1)}^{S} \prod_{S} = 1 \text{ and } \prod_{S} \geqslant 0 \quad [1]$$

where S= number of latent class clusters, $\amalg_S$ is the probability of belonging to a S latent class, Y_{nj} is the score for an n group of subjects in j observed attributes, $fs(Y_{nj}|\varphi_s)$ is a conditional density of Y_{nj} given the vector of parameters $\emptyset_s$ (Vermunt and Magidson, 2005). Every observation can then be classified in the latent class (i.e., group) based on a higher probability of belonging to such a class. The model is probabilistic and not deterministic, as every observation has a different probability of belonging to each latent class.

4. Results

The sample consisted of 452 employees, UK (n=152), Greece (n=100), Denmark (n=100) and France (n=100) who had access to a canteen at their place of work. Most of the employees worked full time (60.4%) and their employment fell under the occupations classification of Technicians and Associate Professionals (74.1%) (International Labour Organization, 2012). There was a slight female bias in the sample (61.1%), and younger workers (20-29) were over represented (51.3%) who had completed some form of higher tertiary education (74.1%). Further socio-demographic characteristics of the sample are presented in Table 2.

Insert table 2 here

Country specific results are presented in Table 3 which outlines the food information formats derived from the exploratory phase and shown to respondents during the questionnaire.

Insert table 3 here

The results are consistent across the sample, in that Traffic Light Labelling, Information box and Quality Assurance are ranked in the top three for all four countries. The results are similar between the different countries with the UK, Denmark and France all preferring Traffic Light Information,

followed by a strong preference for Quality Assurance cues. In Greece, interestingly, there is a higher preference for Interactive Information compared to the other countries.

The individual-level best-worst utility scores were subject to latent class analysis to identify the preference of the sample towards the six different ways of providing food information (Table 4). Latent class cluster models were estimated from two to five clusters and the log-likelihoods (LL) and Bayesian Information Criterion (BIC) of each model compared. The most parsimonious model providing an adequate fit in this case was the model with five clusters.

Insert table 4 here

All clusters (Table 5) were defined based on the revealed importance of each information format that has been identified by the individual-level Best-worst scores. The scores shown are a preference judgement presenting the holistic value or path-worth for each of the criteria tested in this study. Negative weights should be read not as negative influences but as a deviation from the average zero utility to indicate a less important attribute. All attributes tested for in the survey are significantly different between clusters (p-values <0.05), and therefore useful in segmenting the participants into five clusters. Cluster 1 was tagged 'Heuristic Processors' (33%) as these respondents' value easy to find data and are likely to make sense of this. Cluster 2 was tagged 'Brand orientated' (25%) as these respondents are persuaded by Brand authority. Cluster 3 was tagged 'Systematic Processors' (17.3%) as these respondents' favour Footnotes, Information boxes and Interactive Information. Cluster 4 was tagged 'Independent Processors' (16.1%) and is a mixture of where heuristic and systematic processes occur simultaneously. Lastly, cluster 5 was tagged 'Tech-savvy' (8.6%), and as the name implies these are respondents who indicate a high preference for Interactive Information.

Insert table 5 here

Table 4 shows the utility coefficients for the different information provision formats, which are zero-centred. Within each criterion and cluster the utility coefficients sum to 0. The p-value associated with the Wald statistic for all six information provision formats is lower than 0.05, therefore all six variables are useful in segmenting the sample into five different clusters. Socio-demographic differences between the clusters were measured by chi-square. Dietary requirements, employment status and participant country are significant (p <0.05) whereas gender, age, country of birth, household type, household size, occupation and highest level of education were not significant (p> 0.05). Therefore, to present a parsimonious estimation, socio-demographic variables that are not significant have been omitted from Table 5.

Cluster 1: Heuristic Processors

The first cluster is the largest with 33% of participants and characterised by a high preference for Traffic Light Labelling (3.27) and Brands (0.48). Traffic light labelling gives quick at-a-glance nutrition information, whilst brands are a proxy for information about other quality aspects. Additionally, traffic light labelling is generally well received and many consumers are accustomed to this type of labelling through media and retail exposure. This cluster was named heuristic processors, as easy to find data is considered and processed. Information Boxes (-1.31) were the least preferred ways of receiving food information, which imply more processing effort. Employees from the UK form the biggest part of this cluster (45.1%) whilst Danish employees form the smallest part (8.1%). This cluster is predominantly female (64.4%) and has the highest proportion of employees that do not have any dietary requirements (87.9%) for whom quick, directive and semi-directive information is sufficient.

Cluster 2: Brand Orientated

Cluster 2, tagged as Brand Orientated is, the second largest cluster accounting for 25% of all respondents, and defined through participants' choice of Brands (2.96) and Quality Assurance (1.01). In this cluster Traffic Light Labelling (-1.39), was least preferred. All countries are similarly represented in this cluster. Most employees in this cluster are aged between 20 and 29 (59.3%) and have completed higher tertiary education (86.7%). This cluster has the highest percentage of employees with religious dietary requirement (5.3%), which might make use of quality assurance to establish the suitability of food products. Food brands are prominent in consumers' everyday lives and act as a heuristic signal when making food decisions and are recognised for their effectiveness of highlighting credence quality attributes. As a salient decisional factor, perceived quality influences consumer's behavioural intention through attitudes to a positive brand image.

Cluster 3: Systematic Processors

The third cluster containing 17.3% of the participants, termed Systematic Processors, favour Footnotes on menus (1.74), Information Boxes (1.56) and Interactive Information (0.4). Systematic Processing tends to be applied when there is a greater ability and willingness to process more information. There is, amongst this segment, the least preference for more directive ways of providing food information such as Brands (-2.86) as these might not provide the amount or relevance of information desired. Whilst Denmark has the largest membership of cluster 3 (34.6%), France is the least present (12.8%). This cluster is evenly split into employees working full time (50%) and part time (50%). It has also got the highest membership of participants that have special dietary

requirements such as following a particular diet not because of allergies or health reasons but out of choice (15.4%) compared to the other clusters.

Cluster 4: Independent Processors

Cluster 4, tagged Independent Processors, encompasses 16.1% of the participants. In this cluster, there is a high preference for Information Boxes (2.09), Footnotes (1.45), Traffic Light Information (0.23) and Brands (0.15). Whilst in clusters 1 and 3 a distinction is made between heuristic and systematic processors, it is possible for both to occur simultaneously. A preference for information that is processed systematically is driven by motivation, for example, to select the most healthful meal that matches a diet currently followed by an individual. However, this motivation can be overruled by other factors such as time pressure, stress, or pre-occupation with work related tasks. Therefore, non-directive formats might be preferred, but semi-directive systems are also appreciated. Interactive Information (-3.61) and Quality Assurance (-0.29) were less popular ways of providing food information. This cluster is mainly female (65.8%) and although a high number of employees in this cluster do not have any special dietary requirements (74%), it is the cluster with the highest number of employees suffering from allergies (12.3%).

Cluster 5: Tech-savvy

The Tech-savvy segment is the smallest cluster and indicates high preferences for Interactive Information (4.51) and Quality Assurance (0.38). Hereby, Traffic Light Labelling (-1.7) was least preferred. The Tech-savvys are the only group that has a higher proportion of men (51.3%) compared to women (48.7%). Although this cluster has a high proportion of employees aged 20-29 (48.7%), there are also more people aged over 60 (5.1%) in this cluster compared to the other groups. This cluster has a high Greek membership (53.8%) but a low membership of Danish employees (2.6%). Smartphone applications and technology are present in consumers' everyday lives and this different approach to information provision opens new channels of communication between food suppliers and consumers. One of the possible benefits consumers see in this type of information provision is a greater opportunity for personalisation.

5. Discussion

Currently there is much interest regarding the provision of food out-of-home to ensure consumers have access to clear and accurate information about the calorie content of dishes on offer (Public Health England, 2018). Workplace food settings particularly are environments where there is an increased offer (availability), placement and promotion (accessibility) of unhealthy calorie-dense food and beverages (Evenhuis et al., 2018). In a pooled analysis of studies that included food labeling on menus, food labelling was found to reduce consumers' intake of; calories by 6.6 percent, total fat

by 10.6 percent and other unhealthy food options by 13 percent (Shangguan et al, 2019). Even knowledgeable individuals often struggle to estimate the number of calories in canteen meals; thus when diners are confronted with accurate information their attitude towards specific menu items can change, especially for those dishes which are not aligned with expectation. 'Surprising' menu items such as high calorie salads will experience the most dramatic shift in attitude and purchase intention (Ellison et al. 2013). The profile of consumers using labels varies greatly between a preference for directive, simple and graduated labels such as quality assurance logos, to non-directive labels, such as Information boxes as well as chromaticity, i.e. colour coded Traffic Light system. Signpost logos, multiple traffic light labels and labels communicating guideline daily amounts dominate the debate on retail front of pack nutrition labelling (Grunnert and Wills, 2007) but there has been little research of this nature conducted in eating out.

The results of this study indicate that in workplace settings, simpler and directive or semi-directive formats such as Traffic Light system or Quality Assurance logos are favoured. In a canteen setting, where the pace of service does not allow complex cognitive processing of in-depth information, such formats may be of particular value (Pettigrew et al. ,2012). Interestingly, it has been reported that respondents viewing information about energy content in addition to traffic light information tend to select meals with significantly lower mean energy content, a reduction of around 120 kcal than those in a no labelling condition (Morley et al., 2013). Whilst other studies have supported the presence of calorie and macronutrient information to significantly affect purchase intention (Mayfield et al., 2014), a comment supported by Park et al. (2013) who found providing nutritional information led consumers to choose healthier foods.

Brands and Quality Assurance cues were identified in this study by large segments as attractive communication methods. These are well established labelling approaches that can be used in a canteen setting as they provide direction towards certain quality standards but are not negatively perceived as imposing or forcing meal choice in a particular direction (Hoefkens et al., 2012). Previous research has found that both have at least a partial substitute relationship and can be communicated through the use of a logo (Deselnicu, 2013). Compared to other labelling approaches, logos that represent a brand or quality assurance, do not overload the menu with too much information and material provided through brands can be processed more rapidly (Cavanagh et al., 2014). In addition, obtaining quality assurance, such as in the UK the Soil Association's food for life catering mark, which aims to raise standards of nutritional and overall food quality, provenance and environmental sustainability for food served in public sector foodservice (Melchett, 2014), enables

operators to lead by example. This acts as an important tool for operators to communicate their commitment to credence quality signals relating to ethical production of food. It is by demonstrating best practice through an independent endorsement that employees can chose dishes confident in the knowledge that ingredients have been sourced in an ethical and responsible way.

Not all consumers, however, prefer heuristic information that can be provided through traffic light labelling, brands or quality assurance. This can be attributed to a greater need for information (Fischer and Frewer, 2009) and involvement by Systematic Processors (17.3%), and partly by Independents Processors (16.1%), and the Tech-Savvy (8.6%) cluster. Specific dietary requirements present a need for in-depth food information, and systematic processing is used by these consumers when there is little confidence about the judgement derived from information that is provided in a general way (Jooyoung and Hye-Jin, 2009). Consulting detailed information enables consumers to maximise the confidence in their judgement, hence canteen operators need to develop an approach of providing food information that does not overload the menu but still provides sufficient content for those consumers who require more in-depth information. This finding supports the Heuristic Systematic model (Chaiken, 1980) which proposes that involvement, in this case dietary requirement, leads to systematic processing. Moreover, it is possible that due to the inherent simplicity of directive symbols they are considered patronising (Hoefkens et al., 2012). This also puts emphasis on the need to provide additional information to those that seek to match a format to their perceived level of knowledge.

As indicated by the Tech-Savvy cluster, consumers have an increasing interest in receiving data in an electronic format. This 'mobile app-etite' can be observed among a rising number of consumers engaging in mobile technology to plan, purchase, and socially share their meals (Doub et al., 2015). It is therefore not surprising that nutrition and fitness apps were the fastest growing and most downloaded category of apps in 2014 (Gratzke, 2015). There is a high interest amongst consumers to track their food intake and self-monitor through tools like wearable sensors or mobile applications (Gratzke, 2015), however, when eating at work, it is not always possible to monitor food intake in this way. Barriers to meeting customer requirements are multi-fold including administrative, practical and motivational. Administrative and practical reasons such as corporate regulations, lack of knowledge of how to portray information and unavailability of information are all identified as challenges within this sector. Notwithstanding, one of the main drivers behind the popularity for accessing food information through smartphone apps is the opportunity to receive information that is both inexpensive and personalised (Vandelanotte et al., 2016). Canteen operators can benefit

from adopting a proactive approach that facilitates information sharing in a proactive and dynamic way that addresses consumers' high information demands (Chathoth et al., 2014). However, it is accepted that establishing technological communication with consumers requires investment and motivation on behalf of canteen management, as ICT platforms need to be developed and constantly maintained.

Studies have clearly demonstrated that consumers have a strong desire to be more informed about what they are eating (Banterle et al., 2012), and through enabling this, diners will be more confident in the choices that they make, and eating out will, for those who have particular dietary needs, become a lot easier. Industry should seek to develop solutions to ensure that it is possible for consumers to be confident about provision. Further, for some, enhanced information delivery is likely to increase their dining enjoyment. The issues around menu labelling and providing diners with detailed dish information is both contemporary and critical to the current societal challenges of healthy eating and rise in diet related non-communicable diseases. This study offers a substantial focused contribution to the topic, highlighting the effective presentation of food information for individual diners and their likelihood to adopt a Heuristic or Systematic approach. Such knowledge enables operators to deliver information in the most impactful manner.

5.1. Implications for Practice

The findings of this research have a number of implications for practice in the provision of food in workplace canteens. Consumers struggle to make choices or make the wrong choice from a health perspective, partly caused by a lack of nutrient profile information as well as other criteria of concern. The challenge for the foodservice industry is to provide products and services that facilitate and enhance positive food choice in all population segments especially in a canteen where meals are eaten on a consistent basis. Through gaining insight into the perspectives of consumers, information can be provided and in a format that is relevant to enable informed dish decisions. Giving catering managers the understanding of optimal communication channels can enable a more competitive operator. Traffic light labelling was the preferred delivery platform with the opportunity for consumers to discover more detailed information if desired. Increased information provision may also enable transparency and evidence of greater integrity for the food service operator (Price et al, 2016). Consumers with specific dietary needs are often limited in their choices not just by their personal constraints, but also by a lack of information available from serving staff. Catering operators that are open and transparent, demonstrate commitment and trustworthiness to consumers. Furthermore, even if the actual content is not always used, consumers can be reassured

by the presence of such information (Yepes, 2015). Food operators thus will also potentially benefit from increased information provision.

5.2. Implications for Policy

Meals provided in the workplace can form an important part of the overall diet of those who regularly use workplace canteens. The importance of health and wellbeing at work is recognised and forms part of the Europe 2020 strategy for growth, competiveness and sustainable development. However, information needs to be of relevancy and portrayed in a format that can be utilized by consumers. Better information enables transparency for the foodservice operator while allowing evidence of greater integrity. From a public health and food policy perspective, providing consumers with information at the point of purchase will empower and provide the framework for measured food choice decisions.

5.3. Limitations

The work reported here has focussed on workplace canteens using the UK, Greece, Demark and France as examples. Therefore, the context of the four countries, their consumers and stakeholders has an influence on the findings. The respondents taking part in the survey questionnaire were predominantly under the age of 30 years and working in professional or associate professional occupations. Therefore, it is not clear how far the preferences of receiving information represents the views of older employees or employees working in manual labour or blue collar workplaces. While this study has examined consumer preferences for food information provision, it has not assessed the effectiveness in influencing food choice. There is a likely link between presenting information in the manner the consumer prefers and it being effective in directing choice, research assessing behavioural differences would develop knowledge in the area further.

6. Conclusion

To enable healthy decision making in an eating-out situation, communication with consumers is clearly required, but any such communication should be carefully considered to ensure that it is well understood, suitable for each consumer, and suited to specific dishes and food operators. This study contributes to existing research on food information provision in several ways. It addresses the gap in knowledge about workplace canteen consumer preference for different formats of information about food. The international sample utilised in this study is of relevance to canteen managers in

Europe and beyond. The findings are in line with assertions of the dual process theories (Lachman et al. 1979) and evidence from behavioural economics which suggest that much of human behaviour is governed by heuristic processing of simple and contextual cues such as colours, sounds, or likeable characters (Kahneman, 2011). While dominant, it is also clear that this heuristic approach to food information provision is not preferred by all consumers clearly indicating that information providers should take these perspectives into account and consider providing information in diverse formats to cater for different consumers' informational needs. A varied delivery allows engagement with multiple audiences but also recognises the fact that processing styles may vary depending on the situation. Even those identified in this study as heuristic processors may in some situations, experience different levels of involvement in ensuring a healthful diet and in effect switch to a systematic style which requires more information.

Future studies may seek to replicate these findings in different international settings or with consideration of other characteristics of audiences which may be attributed to distinct segments. Beyond this, while findings presented in this study are transferrable to a range of out-of-home eating contexts, it is to be expected that settings such as fine dining may be associated with a different set of expectations and goals from the consumer base. Investigation of preferences for information in such contexts could provide an interesting contrast to the workplace setting and much needed knowledge for hospitality managers.

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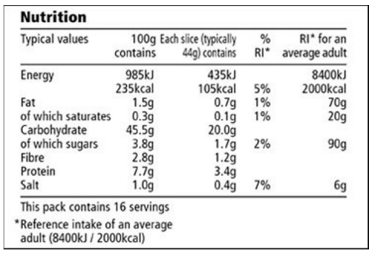
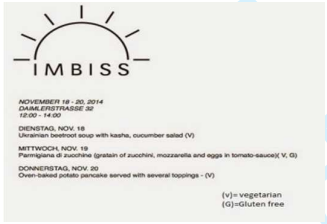
Table 1 Different Ways of Providing Food Information to Consumers

Information form	Example	Definition	Degree of 'directedness', and processing effort and cost (dual process theory)
Nutrition information box		Information boxes provide information on aspects of the food such as nutritional information	• Non-Directive – evaluation left to the consumer • Requires effort and numeracy skills to be utilised by consumer (Watson et al., 2013)
Footnotes		Footnotes that give further information about dishes	• Non-directive - evaluation left to the consumer • Effort and numeracy skills required by consumer
Traffic Light Labelling		Traffic light labels use red, amber and green signals to show consumers whether a product is high, medium or low in key nutritional aspects.	• Semi-directive – provide an evaluation through colour scheme, leaving the overall integration of the partial evaluation to the consumer (Hoefkens et al., 2012). • Easily understood by consumers (Borgmeier and Westenhoefer, 2009), requires less effort.
Quality assurance logos	Red Tractor Logo  Choices logo 	Food is produced to a set of standards and supply chain inspected to ensure that production is in accordance with those standards. Quality Assurance is indicated through the use of a logo.	• Directive - convey the overall healthiness in an 'all or nothing' format • Requires little mental effort, but consumers must be familiar with the logo and understand what it conveys
Product Brands		Brands act as information signals about food products to consumers.	• Directive - reflect high quality in areas that are of importance, that is health, welfare of others and environmental concern • Requires little mental effort but consumers must be familiar with the logo and understand what it conveys
Interactive Information	QR Code	This form of information provision describes contact information for further inquiry or	• Directedness depends on the information it leads to • May require mental effort as it

Provision		the provision of a QR code which can be scanned to obtain further information.	can display larger amounts of information compared to menus • May require involvement by those consumers who show an interest in food information (Nocella et al., 2014)

Table 2 - Socio-demographic characteristics of sample

	Overall Sample (452)	
	N	**%**
Gender		
Male	176	38.9
Female	276	61.1
Age groups		
Below 20	15	3.3
20-29	232	51.3
30-39	96	21.2
40-49	47	10.5
50-59	43	9.5
Over 60	19	4.2
Dietary requirements		
Religious	14	3.1
Allergies	28	6.2
Health related	11	2.4
None	366	81.0
Other	33	7.3
Three person household	81	17.9
Employment status		
Full time	273	60.4
Part time	179	39.6
Occupation		
ISCO-08 Category 1 Managers	52	11.5
ISCO-08 Category 2 Professionals	125	28.3
ISCO-08Category 3 Associate Professionals, Technicians, Students	181	40.0
ISCO-08 Category 4 Clerical Support	15	3.3
ISCO-08 Category 5 Service and Sales	44	9.7
ISCO-08 Category 6 Agriculture, Forestry, Fishery	1	0.2
ISCO-08 Category 7 Craft and related trades	4	0.9

Highest level of Education		
Intermediate general qualification	11	2.4
Gen maturity certificate and/or vocational qualifications	84	18.6
Higher tertiary education	335	74.1

Table 3 - Average best-worst utility scores for all four participating countries (ranked in importance per country - the three most important are given in bold)**.**

	UK n=152	Greece n=100	Denmark n=100	France n=100
Traffic Light Information	**32.11**	**25.61**	**24.45**	**30.16**
Information box (e.g. Ingredients, Allergens and Nutrition)	**27.06**	**20.04**	**29.35**	**23.86**
Quality Assurance (e.g. Red Tractor Logos, Vegetarian and Vegan)	**18.81**	**27.39**	**21.68**	**21.51**
Brand	9.79	8.81	8.92	9.88
Interactive Information (e.g. QR code)	4.63	12.94	2.47	9.32
Footnotes (e.g. on the menu)	7.6	5.21	13.13	5.27

Table 4 - Latent class cluster models fitted to individual-level best-worst scores

Model	LL	BIC_{LL}	Classification Error
Food information provision			
One-cluster model	-6263.8816	12601.127	0.0000
Two-cluster model	-6075.2040	12303.250	0.0266
Three-cluster model	-5958.1431	12148.606	0.0656
Four-cluster model	-5870.4295	12052.656	0.0747
Five-cluster model	**-5821.0982**	**120.33.472**	**0.0763**

Notes: LL=Log-likelihood; BIC_{LL} =Bayesian Information Criterion based on the log-likelihood

Table 5 - Latent class cluster parameter values for all participating countries

	Heuristic Processors (33%)	Brand Orientated (25%)	Systematic Processors (17.3%)	Independent Processors (16.1%)	Tech-savvy (8.6%)	*p*-value	R^2
Traffic Light Labelling	3.27	-1.39	-0.41	0.23	-1.7	<0.01	0.51
Information Box	-1.31	-1.01	1.56	2.09	-1.33	<0.01	0.37
Brand	0.48	2.96	-2.86	0.15	-0.73	<0.01	0.52
Quality Assurance	-0.65	1.01	-0.44	-0.29	0.38	<0.01	0.09
Interactive Information	-0.57	-0.73	0.4	-3.61	4.51	<0.01	0.50
Footnotes	-1.22	-0.84	1.74	1.45	-1.13	<0.01	0.42
Socio-Demographic Parameters							
Dietary requirements							
Religious (n=14)	0.6	5.3	3.8	2.7	5.1	<0.01	
Allergies (n=28)	3.4	2.7	10.3	12.3	7.7		
Health related (n=11)	2.7	2.7	3.8	1.4	0		
None (n=366)	87.9	85	66.7	74	84.7		
Other (n=33)	5.4	4.4	15.4	9.6	2.6		
Employment status							
Full time (n=273)	69.1	54	50	67.1	53.8	0.049	
Part time (n=179)	30.9	46	50	32.9	46.2		
Participant Country							
UK	45	23	26.9	42.5	17.9	<0.01	
Greece	18.8	27.4	25.7	0.00	53.8		
Denmark	8.1	24.8	34.6	43.8	2.6		
France	28.2	24.8	12.8	13.7	25.6		