Analysis of food consumption behaviour and attitudinal data to inform consumer-led NPD

Key external stakeholders:
Food manufacturers, food researchers, public health practitioners, food policy makers, New product development (NPD) professionals

Practical implications for stakeholders:
Using consumer food behavioural data concurrently with consumer attitudinal data generates more accurate and meaningful insights for NPD and policy that are consumer-led and evidence-based.
- In-depth analysis of dietary related CO₂ identifies clusters of dietary patterns and CO₂ emissions.
- Opportunities for NPD in older consumers identified targeting motivations and behaviours to enhance opportunities for healthy and active aging.
- Possibility for policy and NPD to target food choice motivations to make the healthy choice the tasty and convenient choice identified.

Main results:
The key areas of interrogation were sustainability, aging, functional foods, food and health, accompanied by a detailed analysis of the eating patterns of Irish adults in relation to meat and dairy products, with implications for consumer led and targeted new product development.
This research has provided the first ever in-depth examination of food consumption and dietary CO₂, with wide ranging implications for the Irish indigenous food companies particularly those in the dairy and meat sectors. It found that meat and dairy can play an important role in a culturally sustainable diet without negative consequences for the environment.
With regard to functional foods and NPD, the purchase likelihood purchase decreased when consumers had never heard of functional foods, had low belief in product benefits and had low self-perceived dietary health. Hence product success will require significant campaigns focusing on awareness and nutrition education alongside clearly communicated benefits to overcome consumer scepticism towards functional foods.
Taste is the primary driver of food choice for many and should be the primary consideration regarding the promotion of healthy guidelines as well as healthy food products.
A significant proportion of the older population are at risk for malnutrition. NPD should focus on meeting the currently unmet needs of this group and facilitating a healthier choice.

Opportunity / Benefit:
The outputs have far reaching implications for the Irish food industry and in particular the meat and dairy industry. The research completed in the areas of aging, functional foods, health and sustainability has significant potential for policy makers and generates extensive insights into consumer attitudes, motivations and behaviours required for effective and targeted NPD.

Collaborating Institutions:
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1. Project background:
Having a comprehensive understanding of the implications of consumer and demographic trends such as aging populations, health and sustainability is essential to meeting the global food demands of 2050. As life expectancy is increasing across the globe, the number of people aged over 60 years is increasing at a rate faster than all other age groups. The World Health Organisation has forecast that more than one quarter of the European population, including Ireland will be aged 65 years and older by 2050. Aging brings a new and different set of nutritional requirements and healthy lifestyle behaviours are a major determinant of healthy ageing. An understanding of these food behaviours and motivations can help in the development of targeted and appropriate products and policies to enhance quality of life and healthy aging. While the food we eat can impact our general health, it also impacts our climate through greenhouse gas emissions generated from the food system and therefore food policy should include emissions criteria within national dietary guidelines. Hence a greater need for data on dietary related CO₂ exists. Given the export orientation of the Irish food industry, an understanding of not just the domestic market for functional foods and sustainability but also export markets, such as the UK, is essential for product development and developing effective communication and marketing strategies for these countries.

2. Questions addressed by the project:
To determine the climatic impact of food consumption patterns in Irish adults
To profile consumer behaviour segments of health, aging, functional foods and food consumption.

3. The experimental studies:
Databases from the National Adult Nutrition Survey (NANS) of food and beverage consumption, anthropometry, lifestyle, physical activity, and dietary attitudes and motivations data of Irish adults were used. New datasets were generated applying a CO₂ emissions conversion to food consumption data. This is the first time such a dataset has been created in Ireland and has allowed for the first analysis of the climatic impact of food consumption in Ireland to be determined. Significant in-depth analysis, segmentation and profiling of older consumers, food and health motivations as well as dairy and beef consumers was undertaken. PERIscope data was used to examine functional food acceptance and attitudes to sustainability in domestic and international markets. All data sets were analysed and profiled using a range of statistical measures from simple descriptive analysis to principal components analysis and cluster analysis.

4. Main results:
The key areas of interrogation were sustainability, aging, functional foods, food and health, accompanied by a detailed analysis of the eating patterns of Irish adults in relation to meat and dairy products, with implications for consumer led and targeted new product development.
Within the ReVisdata project, the first ever in-depth examination of food consumption and dietary CO₂ was completed with wide ranging implications for the Irish indigenous food companies particularly those in the dairy and meat sectors. In brief, the average Irish adult generates 6.5 kg CO₂eq daily from the food they eat. Red meat contributes most towards daily emissions (22%) followed by dairy (12%) and starchy staples such as rice, bread and pasta (11%). The levels of dietary emissions for Irish adults were comparable to other European countries. Cluster analysis was used to group individuals together based on the type of foods consumed and associated emissions, whereby those with dietary emissions from similar food groups were grouped together. This generated three groups which were labelled ‘Culturally Sustainable’, ‘Unsustainable’ and ‘Nutritionally sustainable’. The ‘Culturally Sustainable’ cluster had the highest consumption of red meat, and had the lowest carbon footprint of the three groups. The ‘Nutritionally Sustainable’ had high consumption of fruit and vegetables with low red meat intake. The highest dietary emissions were generated by the Unsustainable cluster, with higher intakes of alcohol, carbonated beverages, and processed meat. These findings emphasise the importance of looking at dietary patterns in relation to dietary CO₂ and not to look at food groups in isolation.

The aging consumer was profiled based on food consumption, attitudes, motives and health behaviours. Using the NANS, cluster analysis identified three very distinct groups who engage in very different diet and health behaviours. The largest group accounted for more than half of the adults surveyed and had a diet
that was low in fruit and vegetables, high in fat, low in alcohol and low physical activity levels. Based on their health behaviours they are on a vulnerable course, at risk of poor nutritional status and its associated complications. The second group which accounted for one quarter of the adults surveyed, displayed better health behaviours. They adopted sensible health behaviours characterised by a diet with plenty of fruit and vegetables, low in fat and less than five units of alcohol per week and they appear to be on course for healthy aging. The most distinguishing behaviour of the third and smallest group was the high level of alcohol consumption, with an average intake of 24 units per week. This group also had low fruit and vegetable intake, moderate fat intake and moderate levels of activity. There were more men in this group, they were more likely to smoke, many were overweight and mostly in their fifties. The high alcohol consumption as well as the excess body weight needs to be addressed to set this younger group on a healthier life-course. Many Irish adults over 50 years would benefit from support to make healthier and better informed food choices. Targeted new food product development and health promotion practices that takes into consideration age appropriate health matters, as well as specific nutritional requirements have the potential to play a crucial role in positively influencing eating behaviour and health activities and ultimately guiding us on a healthy life course.

Using PERISCOPE data, factors influencing likelihood to purchase functional foods was examined across categories of consumers who indicated that they were unlikely (27%), not sure (36%) and likely to buy (37%) functional foods in the future. Purchase likelihood decreased when consumers had never heard of functional foods, had low belief in product benefits and the relationship between diet and health, perceived their diets as less healthy and had a lower fruit and vegetable intake. Consumers belonging to the ‘not-sure’ group were more likely to use and understand claims and labels but were often confused about healthy eating. The group of consumers “unlikely to buy” were less willing to try new food products. Product success will require significant awareness and nutrition education campaigns alongside clearly communicated benefits to increase awareness and overcome consumer scepticism towards functional foods. Results were comparable between Irish and UK consumers.

Analysis of motivations and attitudes from the NANS dataset alongside the behavioural measures of food intake has shown that taste is the most important food choice motive for consumers, followed by health and nutrition. This impacted on food consumption whereby consumers motivated by health consumed higher amounts of dairy, cereal, fruit and vegetables compared to those who placed lower importance on health. Fat intakes were higher in those who place high importance on taste. BMI was lower and achievement of dietary guidelines such as fruit and vegetable consumption was higher in those placing a higher ranking importance on nutrition. Ranking cost highly as a motivation for food choice was associated with a higher BMI and lower fruit and vegetable consumption, and overall lower compliance with dietary guidelines. These findings indicate that for promotion of healthy eating, targeting the younger male segment would benefit from focusing on taste and convenience while for older female consumers, products should target their pre-existing health orientation. Public health bodies and food companies can mutually benefit from incentives and supports to promote healthy options in a targeted and evidence based manner. Promotion of healthy eating guidelines and healthy food products should account for convenience and taste as the primary driver of food choice and promote the sensory aspects of healthy food choice rather than just the health attributes.

Using National Adult Nutrition Survey data, data on meat consumption for beef, pork, poultry and lamb was subjected to cluster analysis to identify meat consumer segments displaying similar behavioural patterns. Six distinct segments of meat consumers were identified and profiled based on socio-demographic characteristics, attitudes and dietary behaviours. Processed Pork Indulgers, comprising of 13% of the population, derived the highest proportion of their energy (28%) intake from meat in their diet and had fat intakes above what is recommended for a healthy diet. The meat products they consumed most of were pork based, with this segment consuming five times more sausages/bacon/pudding than the other segments. All things meat, was the smallest segment at 4% they consumed all meat types but had the highest lamb consumption of all segments. Energy from meat accounted for 26% of total energy intake and fat intakes were slightly above what is recommended for a healthy diet. Chicken eaters comprising 20% of the population had the highest chicken meat consumption of all segments, and derived 22% of their energy intake from meat. Fish eaters (21%) and Beef focused (21%) both derived 19% of their energy intake from meat. The Fish eaters segment consumed nearly twice as much fish as beef, chicken and pork. The Beef focused cluster consumed the most beef and had a relatively low consumption of other meat and had total fat intakes in line with healthy guidelines. Meat provided 14% of energy intake for Diverse Moderates who accounted for 21% of the population. Their consumption of all meats was at a moderate to low level.

In the dairy consumption analysis, seven distinct clusters were identified and profiled. The ‘Dairy Fuellers’
accounted for 9% of the population and consumed the most dairy. They consumed over 500 grams of dairy per day, mainly full fat milk and were more likely to be men and physically active. The second segment, ‘Dairy Lovers’ also 9%, were predominately older or women, consumed low fat milk, with moderate cheese and high yogurt consumption. The Daily Yogurts (12%) segment had highest yogurt consumption and had low milk consumption. Cheese Please (14%), had the highest cheese consumption with low consumption of milk and yogurt. The Added Benefits (11%) segment consumed fortified low fat milk and yogurts with functional claims. Conservatives (23%) had low cheese and yogurt consumption and predominantly consumed full fat milk. Dairy Dabbler (22%) had low consumption levels of all dairy groups.

5. Opportunity/Benefit: 
The outputs have far reaching implications for the Irish food industry and in particular the meat and dairy industry. Meat and dairy play a diverse and essential role in the diets of Irish adults and consumption is influenced by many food choice motivations. These motivations can be used for effectively targeting new meat/dairy products to the intended consumer segment. Moreover the importance of these foods as a source of protein in the diet of the older consumer has been shown, emphasising the important role that these foods play in a healthy and sustainable diet. The importance of this last finding cannot be over-emphasised. A balanced case has been presented for the need of food groups such as dairy and meat, which often receive unwarranted negative publicity with regards to sustainability, and their role in a healthy, culturally apt and sustainable diet. Heretofore this evidence-base has not been available for the Irish food industry.

The research completed in the areas of aging, functional foods, health and sustainability has significant potential for policy makes and generates extensive insights into consumer attitudes, motivations and behaviours. The research on health and taste demonstrates that not all dietary guidelines and health messages can be communicated to the overall population. Certain health guidelines must communicate the taste and hedonic benefits and override the health benefits in order to generate traction with a significant group of taste-driven consumers. The vulnerability of a large group of our aging consumers is evident. A significant group of the over 70s in the Irish population are on a high health risk trajectory because of their food choices. This group needs additional supports and new products in order to support healthy and active aging, thereby reducing associated costs with ill health and malnutrition.

6. Dissemination:
The dissemination from this project was widespread at national and international conferences, workshops, media articles and many peer reviewed as well as popular publications.

Main publications:

Popular publications:

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