



Accuracy of Nutrition Labelling of Pre-Packaged Food in Ireland

JULY 2010

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ABBREVIATIONS

CHO	Carbohydrate
CFR	Code of Federal Regulations
EC	European Commission
EU	European Union
FSA	Food Standards Agency
FSAI	Food Safety Authority of Ireland
GDA	Guideline Daily Amount
KJ	Energy in Kilojoules
Kcal	Energy in Kilocalories
LACORS	Local Authorities Coordinators of Regulatory Services
MS	Member State(s)
MUFA	Monounsaturates (Monounsaturated Fatty Acids)
Na	Sodium
PUFA	Polyunsaturates (Polyunsaturated Fatty Acids)
RMU	Relative Measurement of Uncertainty
S.I.	Statutory Instrument
SFA	Saturates (Saturated Fatty Acids)
UK	United Kingdom



EXECUTIVE SUMMARY

Improvements in public health can be mediated through an appropriate diet as part of a balanced lifestyle. Sufficient nutrition information should be provided on foods to allow consumers to make informed, healthier dietary choices. This information can be provided in a number of ways but the food label is the most direct source of information. Any information appearing on a food label, which declares nutrient content, can be termed nutrition labelling.

The importance of nutrition labelling has been recognised by many organisations and authorities worldwide. While the provision of nutrition information can help with public health issues it also enables consumers to make informed dietary choices and provides a reference point for official controls on nutritional claims.

Nutrition labelling is currently voluntary within the European Union (EU) but becomes compulsory where a nutrition claim is made for a product or when a product is fortified. It would not be reasonable to expect food to always contain the exact nutrient levels labelled on the pack due to nutrient variations in production and during food storage. However, nutrient content should not deviate substantially from labelled values to the extent that consumers are misled. Acceptable deviations are referred to as tolerances.

At a European level, mandatory tolerances for nutrition labelling have not been set, except in the case of the declaration of fat content in spreadable fats. Some Member States (MS) have developed national guidelines for tolerances on the declaration of vitamin and mineral content as well as for macro-nutrients such as protein and fat. However, Ireland has no national legislation or guidelines on tolerances for nutrient declarations for labelling purposes.

The Food Safety Authority of Ireland (FSAI) commissioned a study to provide data on the accuracy of nutrition declarations in a selection of pre-packaged food products available on the Irish market. This report outlines the results of the study examining 89 products for the accuracy of ten labelled nutrition parameters. Data and findings from this report will also be used as a basis for developing guidance for the Irish food industry in relation to accuracy of nutrition declarations should a legislative approach at EU level not be established in the future.

Approximately 11% of products sampled provided group one nutrition information with 89% providing the more detailed group two nutrition information. All samples provided nutrition information per/100g of product as sold with 60% also providing information per serving or per pack. 47% provided front of pack labelling and Guideline Daily Amount (GDA) information. Of those products providing group two nutrition information, 11% also provided information on MUFA and PUFA while 94% provided nutrition information on dietary fibre and additional data on sodium and/or its salt equivalent in line with FSAI recommendations.

The general accuracy of nutrition declarations varied depending on the specific nutrition parameter examined. On average 51% of nutrition labels were higher (i.e. label over-declaring) and 45% lower (i.e. label under-declaring) than analysis values for the ten nutrition parameters examined in the current survey.

In the United Kingdom (UK), guidance on tolerances for nutritional labelling of protein, fat, carbohydrate, sugars and dietary fibre is available from the Local Authorities Coordinators of Regulatory Services (LACORS). At present it is common to find manufacturers in Ireland adopting United Kingdom (UK) guidance. Applying these guidelines to the results of the current survey indicated that 62% of products complied with the tolerances for protein, carbohydrate, sugars and fat.

The current Regulation on nutrition and health claims made on foods sets limits for specific claims such as low fat, sugars or sodium. 29% of products surveyed made a specific nutritional claim. Of these products making a claim 73% made a claim specifically in relation to fat and saturated fats (SFA). All products making claims complied with the requirements of the aforementioned legislation.

Based on the findings of this report, the FSAI is of the opinion that tolerances for nutrition declarations should be set in the current review of European Labelling legislation. However, should a legislative approach be rejected at Community level then the current data will be used to develop national guidance on tolerances for nutrition declarations. The Irish food industry and its representatives have indicated their support for such an initiative and a working group has been established by the FSAI to develop national guidance.

OBJECTIVE

The objective of this survey was to examine the accuracy of nutrition labelling on pre-packaged foods on the Irish market and to provide these data to the European Commission to inform their work in revision of nutrition labelling legislation ⁵. A secondary objective was to generate sufficient data on which to base national guidelines should a legislative route not be agreed at European level.



1. BACKGROUND

It is now recognised that many public health issues (e.g. *coronary heart disease*) are at least partially related to diet. As such public health can be improved through improvements in diet ¹. To alter or influence dietary choices, sufficient information should be provided at the point of purchase. This information can be provided in a number of ways however the food label is the most direct source of information. Any information appearing on a food label, which declares nutrient content, can be termed nutrition labelling ¹.

The importance of nutrition labelling has been recognised by many organisations and authorities worldwide such as Codex, which adopted its original guidelines on nutrition labelling in 1985 ². While the provision of nutrition information can help with public health issues it also enables consumers to make informed dietary choices and provides a reference point for official controls on nutritional claims.

Different approaches to nutrition labelling are followed in different countries. In the United States ³, mandatory nutrition labelling is required for all pre-packaged foods. In Asian countries such as Thailand and Malaysia mandatory labelling is only required on specified foods. In the European Union (EU) nutrition labelling is voluntary but becomes compulsory if a nutritional claim is made on a product label ⁴. However, if product labels carry voluntary nutrition information the format must comply with the legislative requirements ⁵. Although voluntary, the majority of food manufacturers supplying products to the Irish market include nutrition information on their labels. Directive 90/496/EEC lays down two standardised formats in which nutrition labelling must be presented on product labels (Table 1).

Table 1: Presentation of Nutrition Information under Directive 90/496/EEC ^{a-b}

Group 1 Format	Group 2 Format ^d
Energy (KJ & Kcal) ^c Protein Carbohydrate Fat	Energy (KJ & Kcal) ^c Protein Carbohydrate <i>of which sugars</i> Fat <i>of which saturates</i> Fibre Sodium

^a The European Communities (Nutrition Labelling for Foodstuffs) Regulations, 2009 (S.I. No. 461 of 2009) ⁶ revokes SI 65 of 2005 which transposed Directive 90/496/EC ⁵ on nutrition labelling for foodstuffs and gives further effect to Directive 90/496/EEC as amended by Commission Directive 2003/120/EC by the addition of an energy value conversion factor for salatrims (i.e. reduced energy fats regarded as novel food ingredients). SI 461 of 2009 also specifically gives effect to Commission Directive 2008/100/EC which amends Council Directive 90/496/EEC as regards recommended daily allowances for vitamins and minerals and which inserts a definition for fibre and an energy conversion factor for fibre and erythritol. It should be noted that products not complying with Directive 90/496/EEC, as amended by Directive 2008/100/EC will be prohibited from 31 October 2012.

^b Further information on nutrition labelling is available in the FSAI report on the Labelling of Food in Ireland ⁴.

^c Details relating to energy conversion factors for certain nutrients and the units to be used for the declaration of the nutrients are provided in Directive 90/496/EEC. Energy is calculated using the following values: **Carbohydrate** 4 kcal/g - 17 kJ/g; **Protein** 4 kcal/g - 17 kJ/g; **Fat** 9 kcal/g - 37 kJ/g. Where applicable **Salatrims** 6 kcal/g - 25kJ/g; **Fibre** 2 kcal/g - 8 kJ/g; **Erythritol** 0 kcal/g - 0 kJ/g

^d Nutrition labelling in the group 2 format is compulsory if a health claim is made or where a nutrition claim is made for sugar, SFA, fibre or sodium ¹⁶.

In the Group 1 format basic information consisting of energy, protein, carbohydrate and fat must be provided (Table 1). In the Group 2 format this information is extended to include saturated fats, sugars, sodium and fibre. Additional nutrition information may also be provided by manufacturers under the Group 2 format (e.g. mono and polyunsaturated fats, trans-fatty acids, cholesterol, polyols etc.) and vitamins and minerals as listed in the Annex of Directive 90/496/EEC. All nutrient values in Groups 1 or 2 (Table 1) must be stated per 100g or 100ml of the



foodstuff. Values per serving or per portion can also be additionally labelled provided that the number of servings or portions per packet is specified.

The labelled values shall, according to the individual case, be average values based either alone or in any combination on⁵:

- The manufacturer's analysis of the food
- A calculation from the known or actual average values of the ingredients used, and
- A calculation from generally established and accepted data⁷.

Average value means the value which best represents the amount of the nutrient which a given food contains, and reflects allowances for seasonal variability, patterns of consumption and other factors which may cause the actual value to vary⁵. Within Council Directive 90/496/EEC on nutrition labelling for foodstuffs there is the provision for a number of technical issues to be dealt with via comitology⁵. The Directive stipulates that the definition of tolerable margins between values declared on labelling and those observed by official controls should be determined following the Standing Committee procedure⁵.

Following a 2003 review of Directive 90/496/EEC⁵, the European Commission (EC) prepared proposals in 2007 for amending some technical parts of the Directive, such as tolerances for accuracy of nutrition declarations on product labels⁸. The Directive⁵ is also being reviewed as part of a wider EC proposal for a Regulation on the provision of food information to consumers²⁵. The overall objective of this review is to improve the existing nutrition labelling rules to facilitate better consumer understanding and informed choices, and aid consumers in selecting healthy diets, appropriate for their individual needs. This new Regulation²⁵ will repeal and replace both Directive 90/496/EEC on nutrition labelling⁵ and Directive 2000/13/EC on the labelling, advertising and presentation of foodstuffs to consumers²⁶.

The issue of the setting of tolerances for declared nutrient has also been raised with the EC by a number of MS. The EC was requested by MS to draft guidance on tolerances that would help implement Directive 90/496/EEC as it did not include tolerances in the amending Directive 2008/100/EC⁵. Guidance on tolerances for nutrition labelling would also be applicable to Regulation 1925/2006/EC on the addition of vitamins and minerals and of certain other substances to foods¹⁰. The task of setting tolerable margins for the declaration of nutrient content for food supplements was also identified as a priority during the discussions that led to the adoption of Directive 2002/46/EC on food supplements^{8,11}.

In September 2009 and again in May 2010 a draft Commission document¹² was circulated to MS for discussion. This document identified the technical issues to be considered with regard to the setting of tolerances for declared nutrient values as well as rounding rules. The document also highlighted other work which could be relevant to the discussions on how the guidance might be drafted¹². However, no meeting date for discussion of this draft document¹² has as yet been set. To date tolerances for nutrient labelling declarations have not been established at European Community level, either via legislation or by European guidelines except in the case of the declaration of fat content¹ in spreadable fats⁹. Some MS such as Denmark (Annex 1), the United Kingdom (Section 3.3.1 & Annex 1), Germany, the Netherlands and France have published national guidelines for the declaration of vitamin and mineral content as well as for macro-nutrients such as fat and protein.

Outside the EU, Canada has comprehensible guidance on nutrition tolerances²⁴. Whilst acceptable tolerances in the Canadian system²⁴ are similar, i.e. $\pm 20\%$, to Danish and UK guidance, the actual guidance is much more prescriptive, being based on a sound statistical framework⁸. The purpose being to ensure the industry has a high probability of a label declaration being within the tolerance, whilst the consumer would have an equally high probability that that the label declaration accurately reflects the nutrient content of the food. This statistical approach takes into account nutrient variability in foods as well as method variability⁸.

¹ The indication of the fat content as provided for in Article 3(1)(b) of Regulation (EC) No 2991/94 shall comply with the following rules: (a) the average fat content shall be declared without the use of decimals; (b) the average fat content may not differ by more than one percentage point from the percentage declared. Individual samples may not differ by more than two percentage points from the percentage declared; (c) in all cases, the average fat content must comply with the limits laid down in the Annex to Regulation (EC) No 2991/94. Regulation 2991/94 was repealed on 30 June 2008 by Regulation 1234/2007. However rules were maintained.

Ireland has no national legislation or guidelines on tolerances for nutrient declarations for labelling purposes. Consequently many Irish food businesses follow their own internal guidelines or guidelines published by the Local Authorities Coordinators of Regulatory Services (LACORS)² in the United Kingdom¹³.

² LACORS is the United Kingdom's local government central body responsible for overseeing local authority regulatory and related services in the UK



2. SAMPLE PREPARATION AND ANALYSIS

2.1 Sample Collection and Preparation

Eighty nine products were collected on three separate occasions from the Irish retail market by the FSAI. The samples were analysed by Bodycote Consultus in Cork³. Samples were defrosted where necessary and prepared for analysis by thoroughly blending in a laboratory food processor prior to analysis.

2.2 Sample Analysis

Methodology for laboratory analysis of food products for nutritional declarations is not defined in legislation. Many methodologies of laboratory analysis are available with different degrees of accuracy and applicability. However, allowances for differences between methodologies for analysis of food products were not applied in this report. In the current survey each sample was tested in duplicate using the following accredited methods of analysis (Annex 2):

- **Energy (KJ and Kcal)** - Calculated values i.e. protein + carbohydrate + fat
- **Protein** - Measured by Kjeldahl method using Buchi apparatus. Calculated by Nitrogen X 6.25
- **Total Carbohydrate (CHO) by Difference** i.e. 100 - (Protein + Total Fat + Moisture + Ash) (See Sections 2.2.2 & 2.2.3)
- **Total Fat** - Sample hydrolysed in acid and extracted with petroleum spirit (See Section 2.2.1)
- **Saturates (SFA), Monounsaturates (MUFA) and Polyunsaturates (PUFA)** - Fat extracted from the sample, fatty acids transesterified to fatty acid methyl esters which are separated and measured by gas chromatography
- **Total Sugars** - Measured by Luff School Technique (See Section 2.2.3)
- **Sodium** - Sample ashed, extracted in acid and measured by atomic absorption
- **Moisture** - Moisture removed by oven heating at 102 °C
- **Ash** - Sample is ashed at 550 °C in a muffle furnace

The nutrition parameters of protein, total fat, SFA, MUFA, PUFA, total sugars and sodium were detected at a concentration of 0.1%, equating to a limit of quantification of 0.1g/100g of product.

2.2.1 Analytical Issues with Products Containing Plant Sterols

Plant sterols are natural constituents of plants and are part of a diverse group of naturally-occurring organic chemicals called isoprenoids²⁰⁻²¹. Plant sterols are structurally related to cholesterol and can be divided into phytosterols and phytostanols, phytostanols being the saturated form of the phytosterols²⁰. It has been found that plant sterols in the diet can reduce cholesterol absorption²⁰. Scientific studies indicate that consumption of 1.5g to 3g of plant sterols per/day can reduce the level of low-density lipoprotein cholesterol in individuals if consumed as part of a healthy diet^{20, 22}. To take advantage of this cholesterol-lowering effect, an increasing number of food products with added plant sterols or plant sterol esters have become available on the EU market²⁰.

Six products sampled in the current survey contained added plant sterols. Specific analysis of these products for plant sterol content was not carried out. However, the methodology of fat analysis used in the current survey (Section 2.2) will include plant sterols in values for total fat. As plant sterols are insoluble and don't contribute to the energy values of those foods, declared levels of plant sterols (where available) in these products are subtracted from total fat values in the reporting of results in this report. Subsequently the fatty acid profile of these six products is also modified in line with allowances for plant sterols content in total fat values.

2.2.2 Analytical Issues with Total Carbohydrate Determination

The total carbohydrate content of foods has, for many years, been calculated by difference, rather than analysed directly. Under this approach, the other constituents in the food (protein, fat, water and ash) are determined individually, summed and subtracted from the total weight of the food²³. This is referred to as total carbohydrate by difference and is calculated by the aforementioned formula in Section 2.2²³.

³ Bodycote Consultus is now part of Exova Group Ltd

Total carbohydrate calculated by difference includes dietary fibre⁴, as well as components that are insoluble and/or not carbohydrate such as organic acids^{19, 23} and plant sterols. Allowances for the subtraction of plant sterols from total carbohydrate content (calculated by difference) were not applied in this report. If allowances for subtraction of plant sterols from carbohydrate content were given because they are insoluble, the report would have to consider the contribution of dietary fibre (which was not analysed in the current survey) and other compounds to the carbohydrate content. Total carbohydrate can also be calculated from the sum of the weights of individual carbohydrates and fibre after each has been directly analysed²³.

Available carbohydrate (which doesn't include dietary fibre and other components such as plant sterols) represents that fraction of carbohydrate that can be digested by human enzymes, is absorbed and enters into intermediary metabolism²³. Available carbohydrate can also be calculated by difference by determining and subtracting the dietary fibre component as outlined in the formula for total carbohydrate given in Section 2.2. However, available carbohydrate was not calculated for products sampled in the current survey.

Analysis of products for dietary fibre was not carried out in the current survey. Dietary fibre was not present in all products sampled (just like plant sterols) and not all products surveyed provided nutrition information related to dietary fibre (Section 3.2). As such dietary fibre is not considered in the current survey. Some manufacturers may have declared available carbohydrate (which excludes dietary fibre and this can explain some differences between declared and calculated total carbohydrate results in this survey).

2.2.3 Analytical Issues with Total Sugars Determination

The methodology used for total sugar analysis of all products sampled in the current survey was the Luff Schoorl Technique (Section 2.2). In this analysis a hydrolysis step is performed in order to measure the total sugar content of the products as distinct to the reducing sugars. Some products sampled in the current survey due to their specific composition and ingredients may provide different results for sugar content when the Luff Schoorl Technique is applied by comparison to other methods which manufacturers may have used. However, allowances for these differences were not applied in this report. Other methodologies for analysis of sugars are available with different degrees of accuracy and applicability.

2.3 The Relative Measurement of Uncertainty

The relative measurement of uncertainty (RMU) of the analysis was: Protein 3.3%; Sugars 9.1%; Fat 2.5%; SFA, MUFA, PUFA 13%; Sodium 5.9%; Moisture 2%; Ash 1%; Carbohydrate and Energy 13% (*Derived from a combination of the parameters used in their calculation*). Allowances for the RMU were not applied in this report, unless otherwise indicated.

2.4 Quality Control Measures

The Bodycote Consultus Laboratories operates a unified quality control and assurance protocol to ensure that the results they produce are accurate and reliable. For all test procedures, each batch of samples included an internal reference material that was validated on site. In performing the analyses, all control results were within the validated tolerances for acceptance of the analytical sample results. Bodycote Consultus holds Irish National Accreditation Board (INAB) accreditation for all methods of analysis used in the survey (*Annex 2*).

⁴ The European Communities (Nutrition Labelling for Foodstuffs) Regulations, 2009⁶ defines fibre as carbohydrate polymers with three or more monomeric units, which are neither digested nor absorbed in the human small intestine and belong to the following categories: **(a)** edible carbohydrate polymers naturally occurring in the food as consumed; **(b)** edible carbohydrate polymers which have been obtained from food raw material by physical, enzymatic or chemical means and which have a beneficial physiological effect demonstrated by generally accepted scientific evidence; **(c)** edible synthetic carbohydrate polymers which have a beneficial physiological effect demonstrated by generally accepted scientific evidence.

3. RESULTS AND DISCUSSION

3.1 Reporting of Results

The products analysed in the current survey can be categorised into ready meals/meal solutions (48 products) and dairy products (41 products) with 10 sub-categories of product within ready meals/meal solutions and 4 within dairy products as listed below:

Ready Meals

- Spaghetti Bolognese
- Lasagne
- Shepherd's Pie
- Cottage Pie
- Chicken Curry
- Sweet & Sour Chicken
- Prepared Burgers
- Sandwich Fillers
- Fresh Soup
- Miscellaneous Products

Dairy Products

- Flavoured Yogurts
- Natural Yogurts
- Yogurt Drinks
- Chilled Desserts

3.2 Provision of Nutrition and Other Information

Approximately 11% (10/89) of products sampled provided group one nutrition information with 89% (79/89) of products providing group two nutrition information (Table 1). All samples provided the nutrition information per/100g of product as sold with 60% (53/89) also providing information per serving or per pack. 47% (42/89) provided front of pack labelling and GDA information. Of those products providing group two nutrition information, 11% (9/79) also provided information on MUFA and PUFA while 94% (74/79) provided nutrition information on dietary fibre and additional data on sodium and/or its salt equivalent in line with FSAI recommendations¹⁴.

A further 16% (14/89) of products sampled provided additional nutrition information including calcium, potassium, cholesterol, trans-fatty acids, vitamins C, B2, B6 and B12, Lactose⁵, Omega 3 and Omega 6 fatty acids, plant stanols⁶ and L-Carnitine.

3.3 Accuracy of Declared Nutrition Information (Excluding RMU)

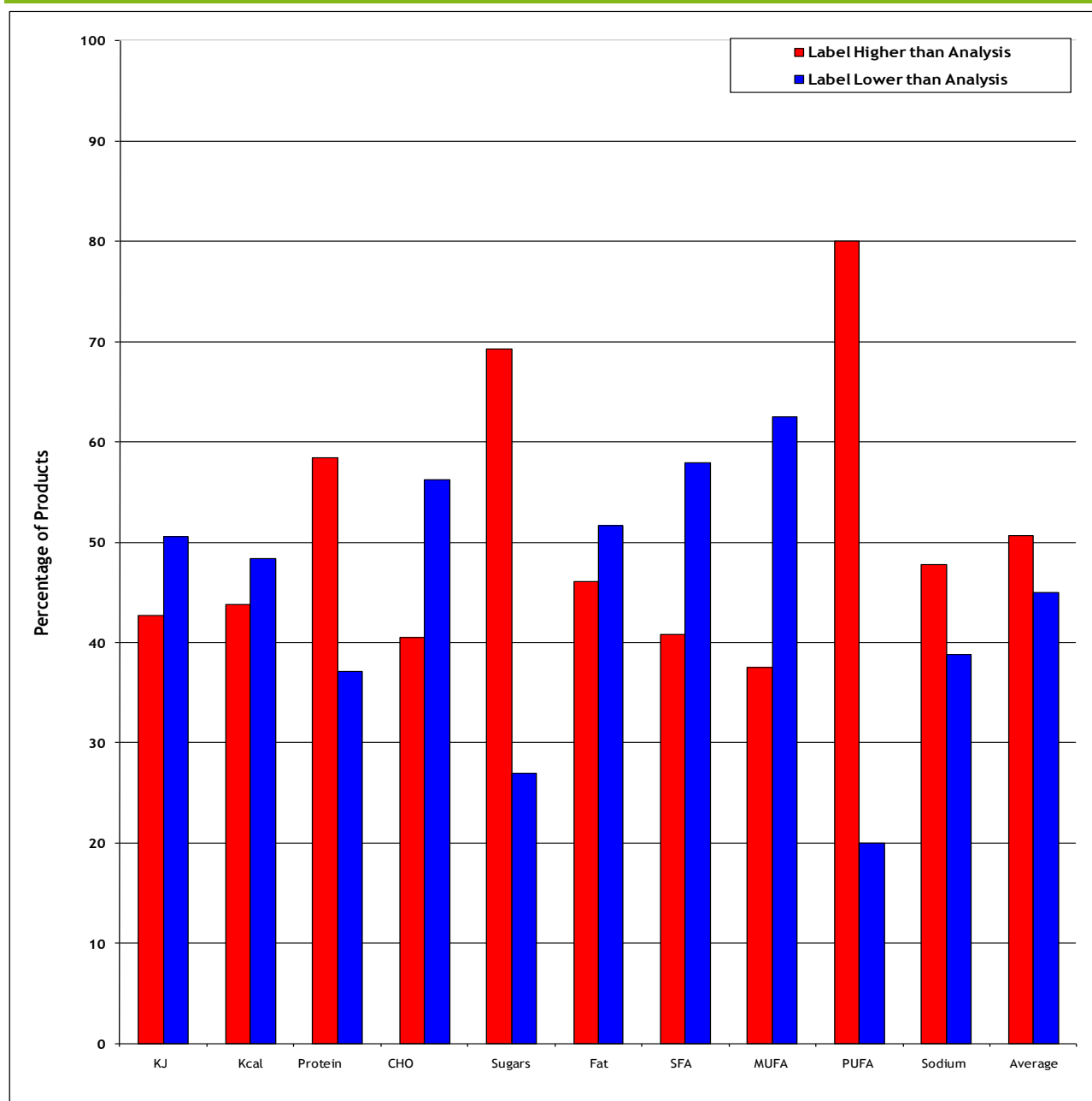
Eighty-nine products were sampled with each product having three samples with a different batch/lot number or shelf-life declaration (i.e. use-by-date or best-before date) giving a total of 267 samples. Average values were then calculated for each of the 89 products from the analytical results of the 3 samples per product for ten nutrition parameters, outlined previously in Section 2.1. This calculation accounted for ingredient and batch variations between samples of the same product. A full list of all products sampled is given in Annex 3.

⁵ Infant formula and follow-on formulae may, subject to certain conditions carry a nutrition claim relating to lactose content. Modifications in the composition of milk in relation to lactose is permitted only if it is indelibly indicated on the packing of the product

⁶ Declarations for plant stanols are required under the Novel Food Regulation (EC) 608/2004. See: http://www.fsai.ie/legislation/food_legislation/novel_foods/labelling.html for further information

On average 51% of nutrition labels were higher (i.e. label over-declaring) and 45% lower (i.e. label under-declaring) than analysis values for the ten nutrition parameters examined in the current survey. However, in some cases depending on the nutrition parameter it can be beneficial to the consumer that a parameter is actually higher or lower in a product than that stated on the nutrition label (Figure 1).

Figure 1: Percentage of Product Labels Under or Over Declaring In Comparison to Analysis Results (Excluding RMU) ^{a-e}



^a Label is higher than analysis (i.e. label over-declaring); label is lower than analysis (i.e. label under-declaring)

^b All values per/100g except for sodium = mg/100g

^c Based on average results of 89 products with 3 samples per product tested (n=267), adjusted for those products which due to nutrition format provided don't state values for specific parameters and/or gave non-precise values such as "trace" or "nil".



^d For the nutritional parameters of sugars, SFA, MUFA, PUFA and sodium 78, 76, 8, 5 and 67 products provided declared values, respectively

^e The RMU of analysis is not applied to the above results - see Section 2.3 for further details.

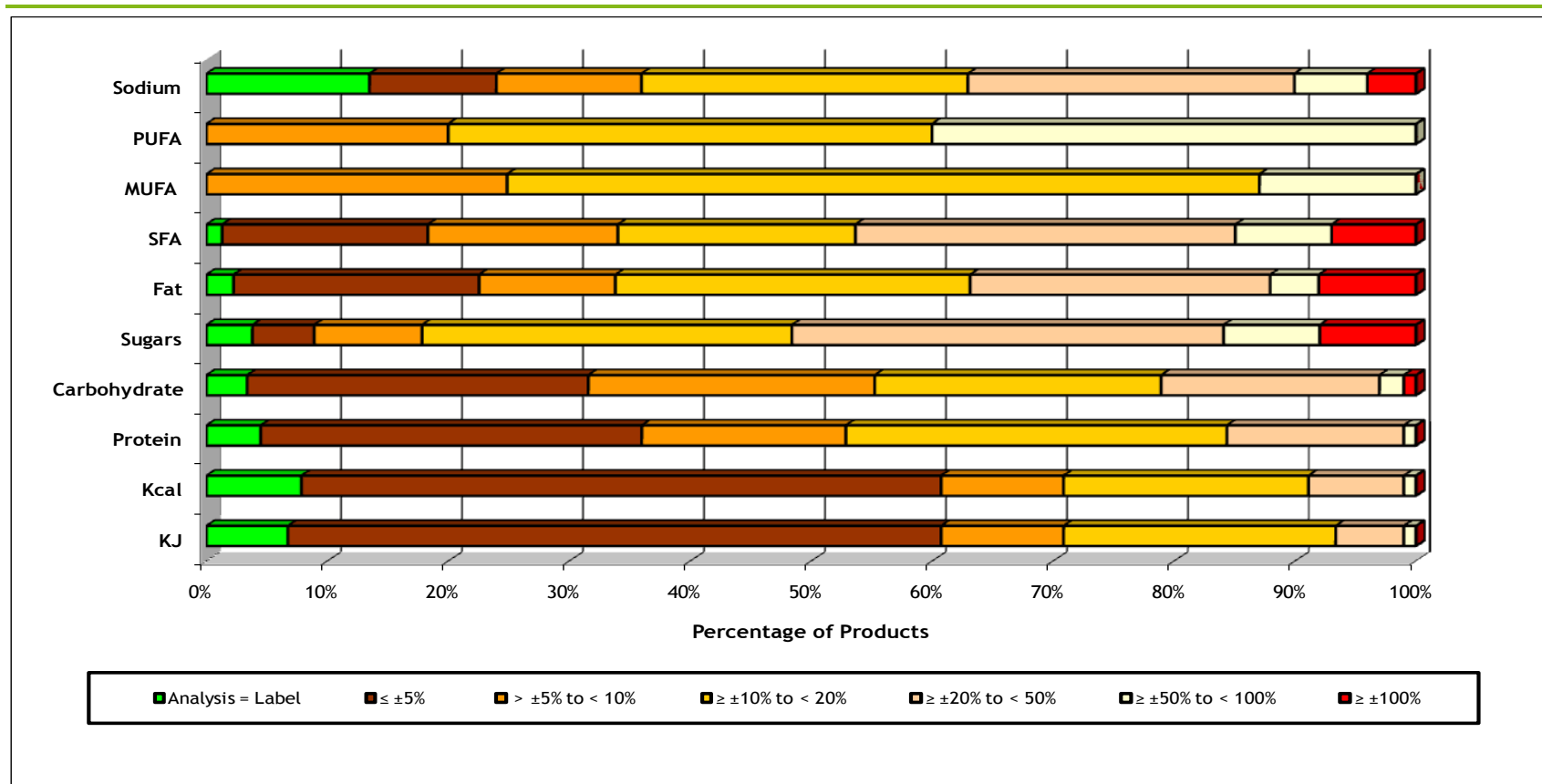
In relation to nutrition parameters such as sugars and protein up to 69% and 58% respectively, of products over declared for these nutrition parameters on the product label. In the case of PUFA up to 80% of products over-declared. However, only five products provided PUFA on their nutrition label (Figure 1).

In other products nutrition components such as fat, carbohydrate and SFA were under-declared (Figure 1). Up to 52%, 56% and 58% of products declaring fat, carbohydrate and SFA respectively under-declared for these nutrition parameters on the product label (Figure 1). In the case of sodium 39% and 48% of products surveyed under-declared and over-declared, respectively for this nutrition parameter (Figure 1).

At least 49% of the 89 products tested were within $< \pm 20\%$ of all ten label declarations examined in the current survey, with over 90% within $< \pm 20\%$ for declared energy values. At least 60% of products tested were within $< \pm 50\%$ of all ten label declarations, with over 85% within $< \pm 50\%$ for nine declared values Figure 2.



Figure 2: Accuracy of Labelled Value Compared to the Average Tested Value (Excluding RMU) Categorised by the Extent of the Percentage Difference between the Two Values for each Nutrition Parameter ^{a-d}



^a All values per/100g except for sodium = mg/100g

^b Based on average results of 89 products with 3 samples per product tested (n=267), adjusted for those products which due to nutrition format provided don't state values for specific parameters and/or gave non-precise values such as "trace" or "nil"

^c For the nutritional parameters of sugars, SFA, MUFA, PUFA and sodium 78, 76, 8, 5 and 67 products provided declared values, respectively

^d The RMU of analysis is not applied to the above results - see Section 2.3 for further details.



In relation to individual nutrition parameters the accuracy of labelled values varied. Values for energy were the most accurate of all parameters examined with over 60% within $\pm 5\%$ for declared energy values. Up to 8% of products declaring fat and sugars and 7% of those declaring saturates had differences of $> \pm 100\%$ between the label declaration and the average tested values (Figure 2).

In some cases the declared value equalled the analysis value for a nutrition parameter. Up to 13% of products tested for sodium had values which equalled the label declaration (Figure 2). However, there were a higher number of products "equal" for sodium because some products declared sodium as < 100 mg/100g rather than a precise value. Some products also didn't declare specific nutrition parameters on their labels or declared them as a "trace" or "nil" value which is undefined. As such comparisons between labels and analysis for accuracy were not possible in these products.

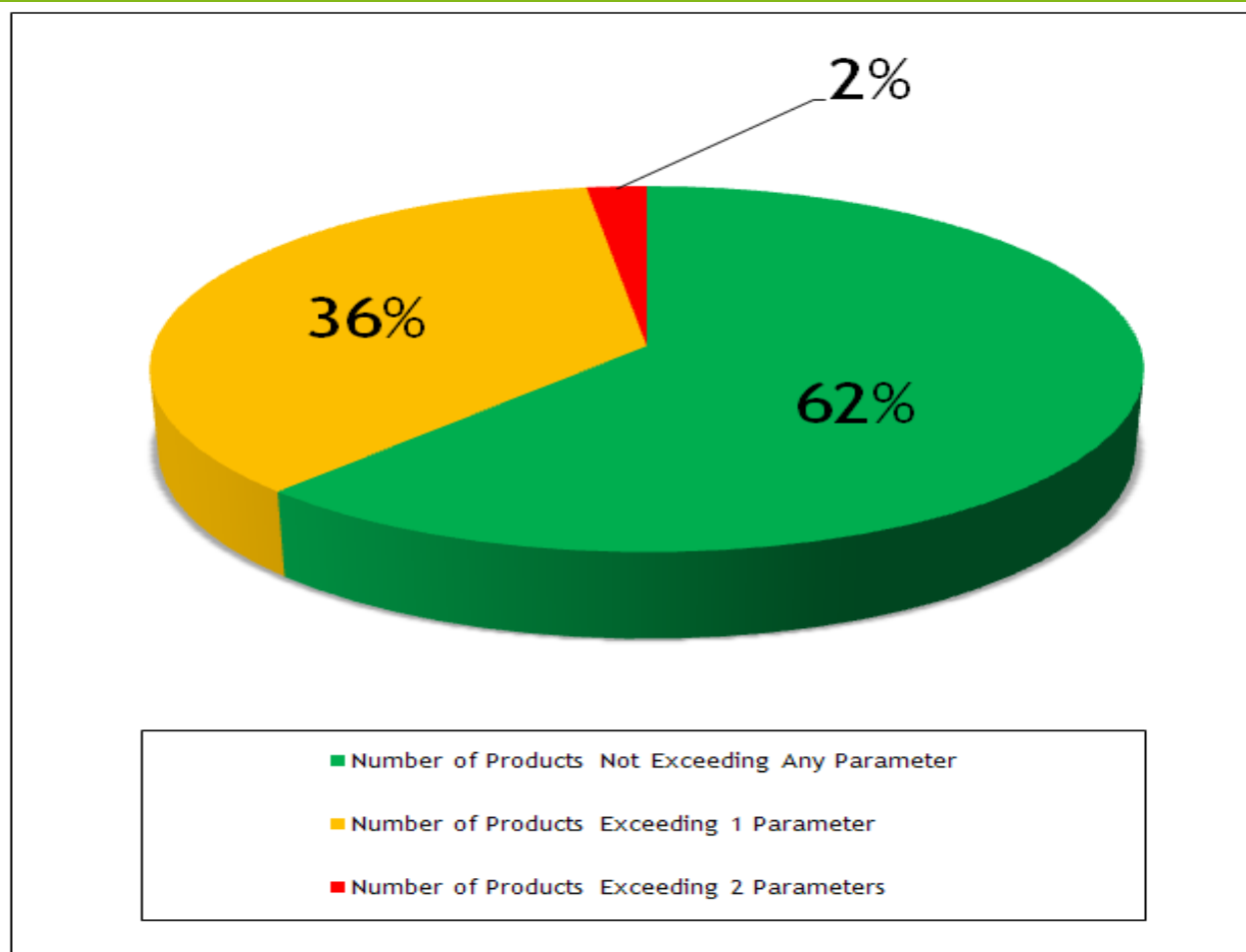
3.3.1 LACORS Guidance on Tolerances for Nutritional Labelling Declarations

The United Kingdom guidance on tolerances for nutritional labelling declarations, which is available from LACORS, is outlined in Annex 1¹³. While the use of the LACORS guidance is neither mandatory nor legally required in Ireland, some Irish food manufacturers use the guidance in assessing their nutrition labelling.

In the current report the relevant LACORS tolerances were applied to each declared nutrition value of each product sampled, to calculate an acceptable range of results for that nutrition parameter. The average results \pm the RMU from the analysis of each product were then compared to this calculated range. If there was overlap between the two ranges, the nutrition labelling was deemed to be in compliance with LACORS. By so doing the acceptable range remains constant every time a similar product is analysed and an acceptable range can be set for that product to facilitate good manufacturing practices by the manufacturer.

This comparison revealed that 62% of products did not exceed any of the LACORS tolerances for protein, carbohydrate, sugars and fat (Figure 3). However, 36% of products exceeded at least one of the specified nutrition tolerances with 2% exceeded two nutrition tolerances. No product surveyed in the current report exceeded more than two of the applicable LACORS nutrition tolerances of protein, fat, carbohydrate and sugars.

Figure 3: Comparison of Survey Results with LACORS Guidance on Tolerances to be Applied to Nutritional Labelling Declarations ^a



^a Products not exceeding any parameter includes those products with no LACORS category; where discretion based on specific individual circumstances is advised by LACORS and if parameter was not stated on product label.

A more detailed overview of current survey results versus the LACORS guidance on nutritional tolerances for protein, carbohydrate, sugars and fat is given in Table 2.

Table 2: Comparison of Survey Results with LACORS Nutritional Tolerances ^a

Category	% Protein	% CHO	% Sugars	% Fat
Percentage of Products Declaring Nutrition Parameter on Product Label ^b	100	100	89 ^f	100
Exceeded LACORS Tolerance ^c	4.5	4.5	19.0	14.6
Within LACORS Tolerance ^c	88.8	93.3	48.1	49.4
No LACORS Category ^d	4.5	0	3.8	1.1
Discretion Advised by LACORS ^e	2.2	2.2	29.1	34.8
Total	100	100	100	100

^a Based on the average analysis of 89 products with 3 samples per product analysed. LACORS does not provide tolerances for energy, SFA, MUFA, PUFA and sodium ¹³

^b Dependent on the format of nutrition labelling provided on product labels (Table 1). 11% (10/89) of products did not include a value for sugar. One product while declaring for sugar didn't give a precise value and declared sugar content as "trace".

^c See Annex 1 for LACORS tolerance values.

^d Tolerances for labelled nutrients equal to 2% or 5% are undefined by LACORS. The number of products equal to 2% or 5% was (4/89) for protein (3/89) for sugars and (1/89) for fat.

^e The tolerance for nutrient levels labelled as <2% is undefined by LACORS and discretion based on specific individual circumstances is advised. Further detail on this discretion was not available from LACORS. The number of products < 2% were (2/89) protein, (1/89) carbohydrate, (23/89) sugars and (31/89) fat.

^f Number of products surveyed declaring sugar content on their nutrition labels was 79/89. As such values for sugar in Table 2 are calculated based on a sample size of 79.

Over 88% of products surveyed were in compliance with the LACORS tolerances for protein and carbohydrate (Table 2). While over 48% of products surveyed were in compliance with the tolerances for sugars and fat (Table 2). In 29% and 34% respectively, of products surveyed the nutrition tolerances for sugars and fat were not defined by LACORS and discretion based on specific individual circumstances was advised (Table 2). However, further detail on this discretion was not available. As such products which fell into this discretionary area or a non-described category (e.g. value = 2% or 5%) could not be judged against the LACORS guidance (Table 2).

While results for some products were outside LACORS tolerances for parameters such as sugar and fat, in some instances the results indicated that the product actually contained lower levels of these parameters than labelled. While unacceptable from the point of view of LACORS tolerances, products having lower levels of sugars and fat are acceptable from a public health perspective. Such discrepancies may result from reformulation work by manufacturers to improve the nutrition profile of their food products where updating of the label lagged behind production of the reformulated product.

3.3.2 Accuracy of Labelled Nutrition Parameters (Excluding RMU) on Products Making Nutritional Claims

The current Regulation on nutrition and health claims made on foods ¹⁶ sets limits for specific claims such as low-fat and low-sodium. For example, the Regulation ¹⁶ states that "a claim that a food is low in fat, and any claim likely to have the same meaning for the consumer, may only be made where the product contains no more than 3 g of fat per 100 g for solids". If a labelled value for a specific claim is outside that limit then that claim is not valid under the Regulation ⁷. Twenty nine percent (26/89) of products surveyed made a specific nutritional claim. Of these 26

⁷ Transitional measures are currently in place for Regulation 1924/2006/EC. See:

http://www.fsai.ie/science_and_health/nutrition_and_health_claims/transitional_measures.html

products making a claim 73% (19/26) made a claim specifically in relation to fat and SFA, 8% (2/26) in relation to sodium or salt, 8% (2/26) in relation to sugars and 11% (3/26) in relation to sugars and fat. All products making claims complied with the requirements of the aforementioned legislation.



4. DISCUSSION

At European level tolerances for the accuracy of nutrition declarations are not specified (except in the case of the declaration of fat content in spreadable fats) and while some MS do have national guidelines on tolerances for labelling purposes Ireland does not. If tolerances were to be defined at a European level (either via legislation or guidelines) this could help improve the accuracy of labelling and aid consumers in selecting healthy diets, appropriate for their individual needs.

Currently the EU is moving towards harmonised rules for addition of vitamins and minerals in food products which will include/are expected to include defined tolerances for the accuracy of the labelled values of these nutrients. However, when establishing tolerances a number of issues need to be considered. For certain nutrients it will be especially important to reflect the issue of stability (e.g. vitamin C). The levels of fat-soluble vitamins will for example require scrutiny because of potential health risks associated with overdosing, in particular vitamin D¹⁷. As such the issue of overages⁸ where fortification of foods occurs will also need to be encompassed by any tolerances that may be set at European level. Given these complex issues it is important that the definition of tolerance is clearly established at European level. In so doing it would ensure that the food industry and enforcement authorities would have the same understanding of the term.

It is clear from this FSAI survey that many nutrient levels can vary from the declared nutrient value on the product label. How significant that variance is, largely depends on what tolerance, if any is applied to the results. Consumer perception of what is acceptable is also important and should be considered when setting tolerances. It should be reiterated that there are currently no legal tolerances for nutrient declarations. The appropriateness of any tolerances for nutrition declarations which may be set will vary, dependent on the nature of a food and how it is processed and prepared. Nutrition parameters will also vary as a result of the natural variation of particular ingredients such as meat and dairy products. Furthermore, some food products which are particularly heterogeneous such as certain breakfast products (e.g. *muesli*) may contain different proportions of ingredients due to small variations in proportions of those ingredients from batch to batch. All of these and other factors influence variations in nutrition composition of food products. Consumers must expect that a certain level of variation is inevitable and unavoidable.

The current Directive on Nutrition Labelling⁵ indicates that average values are the values which best represent respective amounts of the nutrition parameters which a food product contains. As such these average values should take account of seasonal variability, patterns of consumption and any other factor which may cause the value of nutrition parameters to vary. However, while some manufacturers will use average values of their own analytical data to derive nutrition declarations some may use generally established and accepted data (i.e. *food composition tables*) to derive nutrient declarations for labelling purposes⁵. This practice is permitted under current European labelling law. However, the use of established and accepted data can be more prevalent for nutrients which are more costly to determine by analytical means (e.g. sugars, fatty acid profile, sodium) than others such as protein, fat and carbohydrate. Where this is the case, these nutrients may be more likely to be inaccurately described on the nutrition declaration of products. Furthermore the use of average values for nutrition declarations may make the enforcement of any future nutritional tolerances by regulatory bodies difficult to implement.

Based on the findings of this survey any tolerances for nutrition declarations should be nutrient specific. For example, the tolerance for sodium may need to be tighter than the tolerance for protein. The issue of the nutrient impact on health must also be considered. For example, tolerances for protein could be set at a higher level than those for saturated fats due to the links between saturated fats and heart health.

The FSAI is of the opinion that due to the extent of intra-community trade in food, tolerances for nutrition declarations should be agreed at European level and the definitions set in the current review of European Labelling legislation. Should this legislative approach be rejected this FSAI report could be used to develop guidance on tolerances for nutrition declarations. The Irish food industry and its representatives have indicated their support for the development of national guidance.

⁸ Overages are a surplus or excess of nutrients where fortification of foods occurs

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ANNEX 1 Examples of Guidance on Tolerances for Nutrition Declarations from Other EU Member States

United Kingdom

Table 3: LACORS Guidance on Tolerance to be applied to Nutritional Labelling Declarations ^{a-e}

Type of Nutrient	Labelled Nutrient Level in Product	Recommended Tolerance on Labelled Value
Protein, Fat, Carbohydrates, Sugars and Dietary Fibre ^f	More than 2% and less than 5%	± 30% of Labelled Value
	More than 5%	± 20% of Labelled Value
	Less than 2%	Use discretion based on specific individual circumstances

^a For values above 5%, seasonal/natural variability should be considered for meat, for example, this could include species or breed of animal.

^b For wholemeal cereal products and saturated fats higher tolerances may apply.

^c Tolerances for water soluble vitamins (i.e. B, C), oil-soluble vitamins (i.e. A, D and E) and minerals are also provided in the LACOR guidance. However, the current FSAI survey did not examine the accuracy of these declarations.

^d The above LACORS tolerances are generally compatible with those applied in a number of EU Member States including Belgium and the Netherlands ¹³.

^e In 2007, LACORS issued a draft update of its 2003 guidance on tolerances to be applied to nutritional labelling declarations ¹⁵. This updated draft amended the recommended variations for protein, fat, carbohydrate, sugars and dietary fibre and added the parameters of saturated fatty acids and sodium. However, as the Commission has been reviewing the Directive 90/496/EEC LACORS guidance will inevitably be superseded and replaced by European guidance. As such LACORS did not proceed with the revised 2007 guidance and continue to use the 2003 guidance ¹³.

^f For dietary fibre, the figure is based on the AOAC method. However, the current FSAI survey did not examine the accuracy of dietary fibre declarations.

Denmark

The following limits, including analytical uncertainty, regarding macronutrients are used as guidance in Denmark ¹⁸.

Table 4: Guidance on Tolerances to be applied to Nutritional Labelling Declarations in Denmark

Nutrient	Content	Tolerance
Protein		
Carbohydrate		
Fat	≤ 10g per 100g	± 1.5
Sugars	10 – 40g per 100g	± 15%
Polyols	≥ 40g per 100g	± 6g
Dietary Fibres		
Starch		
Fatty Acids (<i>Sum of Saturated, Monounsaturated & Polyunsaturated</i>)	0.5 – 3.5 g per 100g ≥ 3.5 g per 100g	± 0.5 ± 15%
Sodium	In General	± 15%
Cholesterol	In General	± 25%

For naturally occurring vitamins and minerals a tolerance of ± 25% is applied, excluding analytical uncertainty and calculated at a 99% confidential level. For added vitamins and minerals the Danes accept a necessity for asymmetrical margins of tolerance. In dialog with manufacturers and analytical experts an accepted tolerance of 80 – 150 % for added vitamins and minerals, excluding analytical uncertainty and calculated at a 95% confidence level is recommended. The loss of nutrient over time is one of the arguments for accepting asymmetrical tolerance limits. It is important that the actual nutrient content is within tolerance limits during the whole shelf life period. Tighter limits could be used for minerals ¹⁸.



ANNEX 2 Accreditations and Experience of Testing Laboratory

The following information was provided to the FSAI:

- Proof and details of current scope of laboratory accreditation. Bodycote Consultus holds Irish National Accreditation Board (INAB) accreditation for all methods of analysis used in the current survey - Registration Number 183T
- Proof of participation in external proficiency tests and inter-laboratory comparison schemes
- Full details of analysis methodology including information on the limits of detection (LOD) and quantitation (LOQ), use of internal standards and certified reference materials, method performance details etc.
- Proof of practical experience in analysing food samples for total fat content, fatty acid profile and in particular TFA profiles.

ANNEX 3 List of Products Sampled

Table 5 provides a comprehensive list of all 89 products sampled in the current survey. **In reviewing and/or reporting of the data presented in this table the following general considerations must be applied to all products. Product specific considerations are given at the end of Table 5 and must also be applied.**

General Considerations

1. Mandatory tolerances for nutritional labelling are not set at Irish or European levels except in the case of the declaration of fat content in spreadable fats
2. All results are per/100g unless otherwise indicated
3. Labelled values shall, according to the individual case, be average values based either alone or in any combination of the manufacturer's analysis of the food, a calculation from the known or actual average values of the ingredients used, and a calculation from generally established and accepted data⁵⁻⁶. Under current legislation⁶ average value means the value which best represents the quantity of a nutrient which a given food contains, and reflects allowances for seasonal variability, patterns of consumption and other factors which may cause the actual value to vary. In the current survey only laboratory analysis was used to determine nutritional values which may result in differences between labelled values and analysis values. The use of different analytical methodologies to determine nutritional parameters was indicated to the FSAI from a number of companies and this may cause differences in results for parameters such as fat and sugars
4. Analysis results in Table 5 are based on the average of three samples per/product with 89 products sampled
5. Range results in Table 5 are the average analysis results with the Relative Measurement of Uncertainty (RMU) of analysis applied. Section 2.3 has further details on the RMU for each parameter analyzed
6. Data on product batch codes, best before and other information is available on request
7. Some product formulations and labelling may have changed since this survey was carried out. The analysis reflects the situation at the time of product sampling
8. Some raw materials and ingredients (e.g. fruit & vegetables, dairy & meat products) are seasonal in nature and may vary in composition. These variations may in some cases contribute towards differences between labeled and analysis values for nutritional parameters such as protein, fat, carbohydrate and sugars. A number of products indicated on their nutritional declaration that values were approximate due to the variations which occur in natural ingredients. In some products sugar levels may vary from labeled values due to normal conversion of sugars to organic acids during fermentation
9. Some companies provided independent documented evidence that their nutritional analysis of specific products differed from FSAI results and that labelling was based on these results
10. Footnote(s) specific to company comments received by the FSAI are provided in Table 5. In reviewing and/or reporting of data presented in Table 5, for these specific products, the relevant footnote(s) must be considered for that product
11. The FSAI understands from industry that standard practice is to exhaust stocks of existing packaging/labels prior to any changes been made. In other instances where companies are involved in programmes designed to reduce levels of salt, sugars and fats it has been the practice not to make label changes until reductions are embedded within the business
12. Analysis of products for dietary fibre was not carried out in the current survey. Dietary fibre was not present in all products sampled and not all products surveyed provided nutritional information related to dietary fibre and as such dietary fibre is not considered in the current survey. The inclusion of dietary fibre in the by-difference calculation for available carbohydrate (Section 2.2.2) can explain some differences between declared and calculated total carbohydrate results. However, as indicated in Section 2.2.2 the survey considered total carbohydrate not available carbohydrate
13. Recently amended European legislation⁶ has provided a conversion factor for the energy value of dietary fibre in the diet (Table 1). However as dietary fibre was not determined this conversion factor was not applied to the results of the current survey
14. The total sugar content of all products sampled in the current survey was determined using the Luff Schoorl Technique (Section 2.2.3). However, other methodologies for analysis of sugars and other nutritional parameters are available with different degrees of accuracy and applicability depending on the composition and characteristics of specific products. However, allowances for differences between methodologies for analysis were not applied to the current results. See Section 2.2 for further details
15. Products in Table 5 are presented in order of sampling during the survey.



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Table 5: List of Products Sampled (n=89)

Products	Values	Energy KJ/100g	Energy Kcal/100g	Protein	Total Carbohydrate	Total Sugars	Total Fat	SFA	MUFA	PUFA	Sodium (mg/100g)
M&S Count on Us - Spaghetti Bolognese	Analysis	434	103	8.9	12.4	2.5	1.9	0.7	0.8	0.3	192
	Label	405	95	7.5	11.7	1.8	2.1	0.9	NS	NS	210
	Range	377 490	89 116	8.6 9.2	10.8 14.0	2.2 2.7	1.85 1.95	0.57 0.73	0.73 0.95	0.29 0.37	180 203
M&S Improved Recipe - Spaghetti Bolognese	Analysis	689	165	8.3	14.3	2.0	8.2	3.5	3.9	0.5	223
	Label	540	130	8.3	13.1	2.3	4.6	2.1	NS	NS	200
	Range	600 779	143 186	8.0 8.6	12.5 16.2	1.8 2.2	8.03 8.44	3.07 3.98	3.37 4.37	0.41 0.54	210 237
M&S Improved Recipe - Beef Lasagne	Analysis	701	168	7.8	11.6	2.3	10.0	4.5	4.6	0.5	250
	Label	670	160	8.1	11.8	2.7	8.9	4.2	NS	NS	230
	Range	610 792	146 190	7.6 8.1	10.1 13.1	2.1 2.5	9.75 10.25	3.93 5.10	3.98 5.17	0.42 0.54	235 265
M&S Count on Us - Beef Lasagne	Analysis	410	97	7.1	12.4	2.4	2.1	1.0	0.8	0.2	176
	Label	390	90	7.0	11.8	2.7	1.9	0.9	NS	NS	200
	Range	357 463	84 110	6.8 7.3	10.8 14.0	2.2 2.6	2.08 2.19	0.85 1.11	0.74 0.96	0.19 0.24	166 187
M&S - Shepherd's Pie	Analysis	406	97	5.4	10.4	0.8	3.7	2.1	1.2	0.2	321
	Label	420	100	5.4	9.6	1.1	4.5	2.2	NS	NS	400
	Range	353 458	84 109	5.2 5.5	9.1 11.8	0.7 0.9	3.61 3.79	1.83 2.38	1.07 1.39	0.17 0.23	302 340
M&S - Cottage Pie	Analysis	421	100	6.9	10.5	0.5	3.4	1.8	1.4	0.1	219
	Label	480	115	7.2	8.4	0.5	5.8	2.9	NS	NS	320
	Range	366 476	87 113	6.6 7.1	9.1 11.9	0.5 0.5	3.32 3.49	1.53 1.99	1.20 1.56	0.10 0.13	206 232
Denny - Shepherd's Pie	Analysis	584	140	5.0	11.2	0.8	8.3	4.5	3.2	0.3	338
	Label	607	145	5.1	12.1	1.4	8.5	3.7	NS	NS	500
	Range	508 660	122 158	4.9 5.2	9.8 12.7	0.8 0.9	8.09 8.51	3.88 5.05	2.75 3.57	0.27 0.35	318 358



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Products	Values	Energy KJ/100g	Energy Kcal/100g	Protein	Total Carbohydrate	Total Sugars	Total Fat	SFA	MUFA	PUFA	Sodium (mg/100g)
Denny - Cottage Pie	Analysis	478	114	6.2	11.7	1.2	4.7	2.5	1.8	0.2	357
	Label	592	142	6.8	11.3	1.7	8.3	4.0	NS	NS	500
	Range	416 540	99 129	6.0 6.4	10.2 13.3	1.1 1.3	4.55 4.78	2.20 2.86	1.54 2.01	0.13 0.17	336 378
Dunnes - Beef Lasagne	Analysis	416	99	6.2	10.5	2.4	3.5	1.6	1.4	0.3	329
	Label	430	103	6.1	8.6	3.2	4.9	2.4	NS	NS	300
	Range	362 470	86 112	6.0 6.4	9.2 11.9	2.2 2.6	3.45 3.62	1.43 1.86	1.22 1.58	0.28 0.37	310 349
Dunnes - Spaghetti Bolognese	Analysis	311	74	5.5	7.6	2.0	2.4	0.7	1.2	0.4	350
	Label	363	86	4.9	11.9	0.45	2.1	0.6	NS	NS	400
	Range	270 351	64 83	5.4 5.7	6.6 8.6	1.8 2.2	2.31 2.43	0.64 0.83	1.02 1.32	0.31 0.41	330 371
Dunnes - Chicken Curry	Analysis	487	115	6.5	15.5	2.1	3.1	0.5	1.5	0.9	405
	Label	515	122	7.0	17.3	1.8	3.1	0.5	NS	NS	400
	Range	424 550	100 130	6.3 6.7	13.5 17.5	1.9 2.3	2.99 3.14	0.45 0.58	1.35 1.75	0.76 0.98	381 429
Weight Watchers - Cottage Pie	Analysis	322	76	6.6	8.5	1.5	1.8	0.9	0.7	0.1	112
	Label	303	72	5.5	8.5	1.5	1.7	1.0	NS	NS	130
	Range	280 364	66 86	6.4 6.8	7.4 9.6	1.4 1.6	1.72 1.81	0.79 1.02	0.61 0.80	0.06 0.08	105 118
Weight Watchers - Beef Lasagne	Analysis	349	83	6.3	9.7	1.9	2.1	1.0	0.8	0.2	169
	Label	357	85	7.4	8.7	1.8	2.3	1.2	NS	NS	170
	Range	304 395	72 94	6.1 6.5	8.4 11.0	1.8 2.1	2.05 2.15	0.89 1.16	0.67 0.87	0.18 0.23	159 179
Carroll Cuisine - Lasagne (Pork)	Analysis	626	150	7.0	14.1	1.8	7.2	3.3	2.7	0.9	350
	Label	632	151	7.4	13.0	NS	7.7	NS	NS	NS	NS
	Range	545 708	130 169	6.8 7.2	12.3 15.9	1.7 2.0	7.05 7.41	2.88 3.74	2.36 3.07	0.77 1.00	329 371



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Products	Values	Energy KJ/100g	Energy Kcal/100g	Protein	Total Carbohydrate	Total Sugars	Total Fat	SFA	MUFA	PUFA	Sodium (mg/100g)
Tesco Italian - Beef Lasagne	Analysis	604	145	7.7	9.5	1.8	8.4	4.5	3.2	0.4	232
	Label	585	140	7.7	10.6	0.5	7.4	3.9	2.7	0.2	200
	Range	525 682	126 163	7.5 8.0	8.3 10.7	1.7 2.0	8.19 8.61	3.90 5.06	2.77 3.59	0.32 0.42	219 246
Tesco Finest - Beef Lasagne	Analysis	617	148	8.6	10.5	3.0	7.9	3.2	3.4	0.9	132
	Label	570	140	8.4	9.5	3.4	7.2	2.7	3.0	1.0	200
	Range	537 697	128 167	8.3 8.9	9.1 11.8	2.7 3.3	7.70 8.10	2.81 3.65	2.99 3.89	0.77 1.00	125 140
Tesco Light Choices - Cottage Pie ^a	Analysis	320	76	4.8	10.2	1.3	1.7	0.9	0.6	0.1	103
	Label	335	80	6.5	9.2	0.4	1.8	1.0	0.6	Trace	200
	Range	279 362	66 86	4.7 5.0	8.9 11.6	1.2 1.4	1.69 1.78	0.80 1.04	0.56 0.73	0.08 0.10	97 109
Tesco Finest - Spaghetti Bolognese	Analysis	631	151	10.7	10.9	1.4	7.1	2.5	3.4	0.9	207
	Label	620	150	8.4	10.2	1.9	8.1	2.8	3.7	1.0	200
	Range	549 713	131 170	10.3 11.1	9.5 12.3	1.2 1.5	6.96 7.31	2.19 2.85	2.99 3.88	0.75 0.98	195 219
Bia Kid - Spaghetti Bolognese ^a	Analysis	356	85	4.8	8.8	2.1	3.4	1.1	1.9	0.2	16
	Label	484	115	5.5	11.7	2.1	5.2	2.0	NS	NS	20
	Range	310 402	74 96	4.7 5.0	7.6 9.9	1.9 2.3	3.28 3.45	0.93 1.20	1.67 2.17	0.20 0.26	15 17
Bia Kid - Shepherd's Pie ^a	Analysis	422	101	5.3	9.7	1.4	4.5	2.1	2.0	0.2	66
	Label	420	100	3.0	11.6	0.5	4.6	2.3	NS	NS	40
	Range	367 477	88 114	5.1 5.4	8.4 11.0	1.3 1.6	4.42 4.65	1.83 2.38	1.73 2.24	0.21 0.27	62 70
SuperValu - Cottage Pie ^b	Analysis	308	73	4.8	9.4	1.3	1.8	0.9	0.7	0.1	213
	Label	348	83	5.1	8.6	0.8	3.1	1.6	NS	NS	320
	Range	268 348	64 82	4.6 5.0	8.2 10.6	1.2 1.5	1.76 1.85	0.75 0.97	0.63 0.82	0.12 0.16	200 226



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Products	Values	Energy KJ/100g	Energy Kcal/100g	Protein	Total Carbohydrate	Total Sugars	Total Fat	SFA	MUFA	PUFA	Sodium (mg/100g)
Aldi - Cucina Lasagne (Pork)	Analysis	697	167	8.2	13.6	2.6	8.8	3.7	3.5	1.2	463
	Label	677	163	9.1	7.0	NS	10.9	NS	NS	NS	NS
	Range	606 787	145 188	7.9 8.5	11.8 15.3	2.4 2.8	8.61 9.05	3.22 4.18	3.09 4.01	1.04 1.35	435 490
Aldi - Crestwood Fine Foods Cheese & Chive Quiche	Analysis	1184	284	9.1	20.7	2.9	18.3	9.7	6.3	1.5	336
	Label	1140	274	8.2	16.0	2.8	19.7	11.6	NS	NS	300
	Range	1030 1338	247 321	8.8 9.4	18.0 23.4	2.6 3.1	17.84 18.76	8.47 11.00	5.45 7.08	1.30 1.68	316 355
Aldi - Milsons Kitchen Rigatoni Bolognese	Analysis	536	127	6.4	15.0	1.7	4.6	0.8	2.4	1.3	314
	Label	558	133	6.0	15.5	2.2	5.2	0.8	NS	NS	400
	Range	466 605	111 144	6.2 6.6	13.1 17.0	1.5 1.8	4.52 4.75	0.71 0.92	2.05 2.67	1.09 1.42	295 333
Aldi - Milsons Kitchen Sweet & Sour Chicken	Analysis	425	100	5.5	17.7	7.9	0.8	0.2	0.3	0.2	432
	Label	470	111	6.8	20.0	7.5	0.4	Trace	NS	NS	400
	Range	370 480	87 113	5.4 5.7	15.4 20.0	7.2 8.6	0.78 0.82	0.19 0.25	0.26 0.34	0.21 0.28	407 458
Aldi - Milsons Kitchen Beef Lasagne	Analysis	633	151	6.3	14.7	3.0	7.5	2.0	3.5	1.6	439
	Label	616	147	7.1	14.1	3.8	6.9	1.5	NS	NS	500
	Range	551 716	132 171	6.1 6.5	12.8 16.6	2.7 3.3	7.28 7.65	1.72 2.24	3.08 4.00	1.41 1.83	413 465
Lidl - Mr Choi`s Sweet & Sour Chicken ^b	Analysis	594	141	8.5	16.7	3.2	4.5	0.5	2.4	1.4	208
	Label	597	141	8.8	20.0	7.8	2.9	0.4	NS	NS	140
	Range	517 672	123 160	8.2 8.7	14.5 18.9	2.9 3.5	4.39 4.61	0.47 0.61	2.08 2.70	1.22 1.59	196 220
Lidl - Trattoria Alfredo Beef Lasagne Bolognese	Analysis	672	160	9.0	14.0	2.3	7.6	3.1	3.3	0.9	450
	Label	610	146	9.0	12.0	NS	7.0	NS	NS	NS	NS
	Range	585 759	140 181	8.7 9.3	12.2 15.9	2.1 2.5	7.38 7.76	2.71 3.52	2.83 3.68	0.75 0.98	423 476



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Products	Values	Energy KJ/100g	Energy Kcal/100g	Protein	Total Carbohydrate	Total Sugars	Total Fat	SFA	MUFA	PUFA	Sodium (mg/100g)
Lidl - Kan Pur Garden Chicken Jalfrezi with Pilau Rice ^c	Analysis	569	135	8.3	15.8	1.8	4.3	1.2	2.1	0.8	184
	Label	512	122	8.5	11.4	2.0	4.7	0.7	NS	NS	160
	Range	495 643	118 153	8.0 8.6	13.7 17.8	1.6 1.9	4.23 4.44	1.07 1.39	1.84 2.40	0.69 0.89	173 195
Birds Eye - Shepherd's Pie	Analysis	338	80	5.4	8.7	0.7	2.6	1.2	1.2	0.1	108
	Label	383	91	4.4	9.7	1.0	3.9	1.5	NS	NS	100
	Range	294 382	70 91	5.3 5.6	7.6 9.8	0.6 0.8	2.57 2.70	1.07 1.39	1.05 1.36	0.08 0.10	101 114
Tesco Value - Shepherd's Pie ^a	Analysis	294	70	3.1	9.8	0.9	2.0	0.9	0.8	0.2	234
	Label	295	70	3.0	11.0	0.2	1.5	0.8	0.5	Trace	200
	Range	256 332	61 79	3.0 3.2	8.6 11.1	0.8 0.9	1.95 2.05	0.82 1.06	0.71 0.93	0.13 0.17	221 248
Tesco Value - Cottage Pie	Analysis	358	85	4.7	10.8	0.9	2.6	1.3	1.0	0.1	193
	Label	340	80	3.6	10.1	0.1	2.8	1.3	1.2	Trace	200
	Range	311 404	74 96	4.5 4.9	9.4 12.2	0.8 0.9	2.50 2.63	1.15 1.50	0.90 1.16	0.08 0.11	181 204
Kiddylicious - Tomato & Chicken Rice with Vegetables	Analysis	444	105	5.9	14.5	0.6	2.7	0.4	0.6	1.5	58
	Label	491	117	7.5	14.2	1.5	3.3	0.4	NS	NS	70
	Range	387 502	92 119	5.7 6.1	12.6 16.3	0.5 0.7	2.60 2.73	0.34 0.45	0.57 0.73	1.31 1.70	55 62
Clayton Love - 1st Choice Chicken Curry ^a	Analysis	397	94	5.3	14.8	1.8	1.5	0.4	0.7	0.4	182
	Label	492	117	6.1	14.9	Trace	2.7	0.5	NS	NS	200
	Range	346 449	82 106	5.1 5.4	12.8 16.7	1.7 2.0	1.50 1.57	0.32 0.42	0.65 0.84	0.31 0.40	171 192
Clayton Love - 1st Choice Sweet & Sour Chicken ^{a, d}	Analysis	363	86	5.3	15.0	4.9	0.5	0.2	0.2	0.1	201
	Label	440	105	5.9	18.2	5.7	0.9	0.2	NS	NS	200
	Range	316 410	74 97	5.1 5.5	13.0 16.9	4.5 5.4	0.49 0.51	0.14 0.18	0.16 0.21	0.12 0.16	189 213



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Products	Values	Energy KJ/100g	Energy Kcal/100g	Protein	Total Carbohydrate	Total Sugars	Total Fat	SFA	MUFA	PUFA	Sodium (mg/100g)
Quorn - Cottage Pie (500g) ^a	Analysis	277	66	2.8	11.6	0.9	0.9	0.5	0.2	0.1	293
	Label	247	59	2.5	9.0	0.8	1.4	0.9	NS	NS	400
	Range	241 313	57 74	2.7 2.9	10.1 13.1	0.8 0.9	0.85 0.89	0.42 0.55	0.20 0.26	0.10 0.13	276 311
Weight Watchers - Chicken Tikka	Analysis	376	89	7.0	13.5	2.0	0.7	0.2	0.3	0.2	124
	Label	371	87	6.2	14.3	2.2	0.6	0.2	NS	NS	160
	Range	327 425	77 100	6.8 7.3	11.7 15.3	1.8 2.2	0.72 0.75	0.19 0.25	0.25 0.33	0.17 0.22	117 131
Findus - Chicken Curry ^{a, e}	Analysis	507	120	5.4	18.1	1.9	2.9	0.7	0.8	1.3	289
	Label	470	110	5.0	17.0	1.0	2.5	0.8	NS	NS	100
	Range	441 573	105 136	5.2 5.6	15.7 20.4	1.7 2.1	2.86 3.01	0.64 0.83	0.71 0.92	1.10 1.43	272 306
SuperValu - Sweet & Sour Chicken ^b	Analysis	520	123	7.2	15.1	5.2	3.8	0.6	2.0	1.1	360
	Label	510	121	7.3	17.7	5.9	2.3	0.5	NS	NS	350
	Range	452 587	107 139	6.9 7.4	13.2 17.1	4.8 5.7	3.71 3.90	0.49 0.64	1.71 2.23	0.95 1.24	339 381
Walsh Family Foods - Pork Ribsteaks ^b	Analysis	955	227	13.3	23.9	5.6	8.7	3.0	3.7	1.7	863
	Label	1032	246	13.8	22.1	5.3	11.4	3.5	NS	NS	200
	Range	831 1079	198 257	12.9 13.7	20.8 27.0	5.1 6.1	8.52 8.95	2.62 3.40	3.21 4.17	1.44 1.87	812 914
Walsh Family Foods - Cheese Burger ^b	Analysis	1082	258	13.4	26.1	4.0	11.1	4.8	4.7	1.2	599
	Label	1068	254	14.2	27.1	9.9	3.2	2.6	NS	NS	600
	Range	941 1222	224 291	13.0 13.9	22.7 29.5	3.6 4.4	10.79 11.34	4.14 5.38	4.05 5.26	1.02 1.32	564 635
Rustlers - The Big One Beef Burger	Analysis	1144	274	15.1	18.8	3.6	15.3	7.2	6.7	0.8	493
	Label	1117	267	15.1	17.3	2.6	15.3	6.5	NS	NS	600
	Range	995 1292	238 309	14.6 15.6	16.3 21.2	3.3 4.0	14.95 15.72	6.26 8.13	5.83 7.58	0.66 0.85	464 522



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Products	Values	Energy KJ/100g	Energy Kcal/100g	Protein	Total Carbohydrate	Total Sugars	Total Fat	SFA	MUFA	PUFA	Sodium (mg/100g)
Rustlers - Bacon Quarter Pounder with Cheese	Analysis	1173	280	16.8	19.2	3.7	15.2	6.9	6.5	1.1	664
	Label	1140	273	16.2	18.2	2.5	15.0	6.2	NS	NS	710
	Range	1020 1325	244 317	16.2 17.3	16.7 21.7	3.3 4.0	14.79 15.55	6.02 7.81	5.67 7.37	0.94 1.22	625 703
Yoplait - Forest Fruits Yogurt	Analysis	414	98	3.7	14.2	11.1	2.9	1.9	0.8	0.1	54
	Label	406	97	3.8	14.5	14.0	2.6	1.7	NS	NS	<100
	Range	360 467	85 111	3.6 3.9	12.4 16.1	10.1 12.1	2.86 3.01	1.66 2.16	0.69 0.90	0.08 0.11	51 57
Yoplait - Petits Filous Strawberry	Analysis	473	113	5.9	11.8	9.5	4.7	3.0	1.3	0.1	27
	Label	474	113	6.4	11.2	10.8	4.7	3.1	NS	NS	<100
	Range	412 535	98 127	5.7 6.1	10.3 13.3	8.6 10.4	4.55 4.78	2.62 3.41	1.15 1.50	0.10 0.14	26 29
Weight Watchers - Toffee Yogurt a, f	Analysis	171	40	4.3	5.1	4.1	0.3	0.2	0.1	0	60
	Label	171	40	3.9	5.9	5.5	0.1	< 0.1	NS	NS	<100
	Range	149 193	35 46	4.1 4.4	4.4 5.7	3.8 4.5	0.29 0.31	0.21 0.27	0.06 0.07	0.01 0.01	57 64
Weight Watchers - Vanilla Yogurt a, f	Analysis	175	41	4.1	5.5	3.8	0.3	0.2	0.1	0	54
	Label	178	42	3.9	6.5	6.2	0.1	< 0.1	NS	NS	<100
	Range	152 197	36 47	4.0 4.2	4.8 6.2	3.5 4.1	0.29 0.31	0.17 0.22	0.07 0.10	0.01 0.01	51 57
Danone - ACTIVIA Raspberry Fruit Layer	Analysis	392	93	3.4	13.7	9.8	2.7	1.8	0.7	0.1	59
	Label	360	86	3.5	11.6	11.0	2.8	1.7	NS	NS	50
	Range	341 443	81 105	3.3 3.5	11.9 15.5	8.9 10.7	2.67 2.80	1.55 2.02	0.64 0.83	0.08 0.11	56 63
Danone - ACTIVIA Bifidus ActiRegularis Natural Low Fat Yogurt a, g	Analysis	261	62	4.6	6.2	3.5	2.1	1.4	0.5	0	64
	Label	257	61	4.9	6.1	6.1	1.9	1.2	NS	NS	60
	Range	227 295	54 70	4.5 4.8	5.4 7.0	3.2 3.8	2.05 2.15	1.23 1.60	0.47 0.62	0.04 0.06	60 67



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Products	Values	Energy KJ/100g	Energy Kcal/100g	Protein	Total Carbohydrate	Total Sugars	Total Fat	SFA	MUFA	PUFA	Sodium (mg/100g)
Tesco Organic - Whole Milk Natural Yogurt	Analysis	431	103	7.0	8.2	4.7	4.7	3.1	1.3	0.1	78
	Label	335	80	4.7	6.3	6.3	4.0	2.5	NS	NS	Trace
	Range	375 487	89 116	6.8 7.2	7.1 9.3	4.3 5.2	4.55 4.78	2.68 3.47	1.09 1.41	0.12 0.15	73 83
Glenisk - Organic Natural Low Fat Yogurt ^{a, u}	Analysis	316	75	5.7	7.5	4.0	2.5	1.6	0.7	0.1	72
	Label	278	66	5.2	6.8	6.8	2.0	1.3	NS	NS	70
	Range	275 357	65 85	5.5 5.9	6.6 8.5	3.7 4.4	2.41 2.53	1.41 1.83	0.57 0.74	0.06 0.07	68 76
Muller - Rice Strawberry ^a	Analysis	450	106	3.1	18.6	10.2	2.2	1.4	0.6	0.1	88
	Label	464	110	3.2	19.3	NS	2.2	NS	NS	NS	NS
	Range	391 508	93 120	3.0 3.2	16.2 21.1	9.3 11.1	2.11 2.22	1.21 1.57	0.54 0.70	0.06 0.08	82 93
Avonmore - Fresh Creamed Rice ^{a, h}	Analysis	419	99	2.7	16.7	5.7	2.4	1.5	0.7	0.1	27
	Label	522	124	3.4	21.0	9.8	2.9	Trace	NS	NS	Trace
	Range	365 474	86 112	2.6 2.8	14.5 18.9	5.2 6.2	2.34 2.46	1.34 1.75	0.58 0.76	0.07 0.09	25 28
Danone - Actimel Original	Analysis	310	73	2.9	11.8	9.5	1.6	1.1	0.5	0.1	39
	Label	304	72	3.0	10.5	10.5	1.6	1.1	NS	NS	Trace
	Range	269 350	64 83	2.8 3.0	10.2 13.3	8.6 10.3	1.59 1.67	0.92 1.19	0.40 0.52	0.04 0.06	37 42
Yakult Original - Fermented Skim Milk Drink ⁱ	Analysis	318	75	1.2	16.6	14.9	0.4	0.3	0.1	0	14
	Label	311	74	1.4	17.2	17.2	< 0.1	< 0.1	NS	NS	20
	Range	277 359	65 85	1.16 1.24	14.5 18.8	13.5 16.2	0.39 0.41	0.22 0.29	0.10 0.13	0.01 0.01	13 14
Benecol - Strawberry Yogurt Drink with Plant Stanol Ester ^j	Analysis	246	59	2.9	6.3	3.8	2.43	1.19	0.73	0.32	41
	Label	238	57	3.2	6.2	4.5	2.1	0.1	NS	NS	Trace
	Range	214 278	51 66	2.8 3.0	5.5 7.2	3.5 4.2	2.37 2.49	1.04 1.35	0.63 0.82	0.28 0.37	38 43



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Products	Values	Energy KJ/100g	Energy Kcal/100g	Protein	Total Carbohydrate	Total Sugars	Total Fat	SFA	MUFA	PUFA	Sodium (mg/100g)
Alpro Soya - Strawberry ^{a, t}	Analysis	351	83	4.0	10.9	8.4	2.6	0.8	0.6	1.2	59
	Label	330	78	3.8	10.0	9.5	2.2	0.4	0.5	1.3	50
	Range	305 396	72 94	3.9 4.1	9.5 12.3	7.7 9.2	2.57 2.70	0.67 0.88	0.49 0.64	1.03 1.33	55 62
Aldi - Optifit Vanilla Probiotic Yogurt Drink	Analysis	357	84	3.0	15.9	12.5	0.9	0.6	0.3	0	40
	Label	354	84	2.8	16.3	13.7	0.8	0.6	NS	NS	Trace
	Range	311 403	73 95	2.9 3.1	13.9 18.0	11.4 13.6	0.91 0.96	0.53 0.69	0.22 0.29	0.02 0.03	38 43
Aldi - Cholesterol Reduced Sugar Original Yogurt Drink ^{a, k-l}	Analysis	247	59	3.2	8.0	4.7	1.53	1.03	0.37	0.07	42
	Label	222	53	3.4	6.6	5.0	1.4	0.4	NS	NS	Trace
	Range	215 279	51 66	3.1 3.3	7.0 9.1	4.2 5.1	1.50 1.57	0.90 1.17	0.32 0.41	0.06 0.08	40 44
Aldi - Cholesterol Strawberry Flavoured Yogurt Drink ^{a, k-l}	Analysis	341	81	2.9	15.1	12.2	0.97	0.64	0.25	0.04	41
	Label	351	84	3.2	14.7	11.0	1.4	0.4	NS	NS	Trace
	Range	297 386	70 91	2.8 3.0	13.1 17.1	11.1 13.3	0.94 0.99	0.55 0.72	0.21 0.28	0.04 0.05	39
Aldi - Organic Strawberry Yogurt	Analysis	417	99	4.0	14.1	10.7	2.9	1.9	0.8	0.1	50
	Label	532	126	3.4	21.8	19.0	2.8	1.4	NS	NS	40
	Range	363 471	86 112	3.9 4.2	12.3 15.9	9.8 11.7	2.86 3.01	1.63 2.12	0.71 0.92	0.10 0.13	47 53
Aldi - Brooklea Light Natural Low Fat Bio Yogurt ^a	Analysis	237	56	4.5	5.8	2.8	1.7	1.1	0.5	0	78
	Label	232	55	5.4	5.2	5.2	1.5	0.9	NS	NS	30
	Range	206 268	49 64	4.3 4.6	5.1 6.6	2.5 3.0	1.63 1.71	0.95 1.23	0.40 0.52	0.04 0.05	73 83
Aldi - BeXlight Virtually Fat Free Natural Yogurt ^a	Analysis	193	46	4.6	6.0	3.2	0.4	0.2	0.1	0	55
	Label	205	48	5.6	6.0	6.0	0.2	Trace	NS	NS	50
	Range	168 218	40 51	4.4 4.7	5.2 6.8	2.9 3.5	0.36 0.38	0.19 0.25	0.10 0.12	0.02 0.02	52 58



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Products	Values	Energy KJ/100g	Energy Kcal/100g	Protein	Total Carbohydrate	Total Sugars	Total Fat	SFA	MUFA	PUFA	Sodium (mg/100g)
Dale Farm In Tune Cranberry Probiotic Health Drink ^a	Analysis	304	72	2.5	13.0	10.9	1.1	0.7	0.3	0	50
	Label	275	65	2.0	12.2	10.9	0.9	0.6	NS	NS	Trace
	Range	264 343	62 81	2.4 2.6	11.3 14.7	9.9 11.9	1.04 1.09	0.58 0.76	0.28 0.36	0.02 0.03	47 53
Aldi Brooklea Strawberry Fromage Frais	Analysis	570	136	5.8	14.5	11.8	6.1	4.0	1.6	0.2	31
	Label	592	141	5.2	14.8	14.8	6.8	4.4	NS	NS	200
	Range	496 644	118 154	5.6 6.0	12.6 16.4	10.7 12.8	5.92 6.22	3.46 4.49	1.43 1.85	0.16 0.21	29 32
Aldi BeXlight Virtually Fat Free Strawberry Yogurt	Analysis	513	121	3.6	26.0	12.6	0.3	0.2	0.1	0	69
	Label	322	76	3.7	15.0	11.0	0.1	0.1	NS	NS	Trace
	Range	446 579	105 136	3.4 3.7	22.6 29.4	11.5 13.7	0.26 0.27	0.14 0.18	0.07 0.09	0.02 0.02	65 73
Aldi Optifit Low Fat Strawberry Yogurt	Analysis	282	67	4.8	8.4	3.8	1.6	1.0	0.4	0.1	749
	Label	252	60	4.9	6.9	4.4	1.4	0.9	NS	NS	Trace
	Range	246 319	58 76	4.6 5.0	7.3 9.5	3.5 4.1	1.53 1.61	0.85 1.10	0.38 0.50	0.07 0.09	704 793
Aldi Specially Selected Strawberries & Cream Indulgence Yogurt	Analysis	574	137	2.4	16.0	11.5	7.0	4.5	1.9	0.3	43
	Label	551	132	2.6	15.0	14.2	6.8	4.4	NS	NS	100
	Range	500 649	119 155	2.4 2.5	14.0 18.1	10.5 12.6	6.86 7.21	3.96 5.14	1.64 2.12	0.26 0.34	41 46
Glenisk Organic Blueberry Low Fat Yogurt ^{a, u}	Analysis	399	95	4.8	14.0	9.2	2.1	1.4	0.6	0.1	60
	Label	384	91	4.3	14.6	14.1	1.6	1.0	NS	NS	60
	Range	347 451	82 107	4.6 5.0	12.2 15.9	8.4 10.1	2.08 2.19	1.21 1.57	0.49 0.64	0.08 0.10	56 64
Flora Pro Activ Strawberry Yogurt Drink ^{k,m,n}	Analysis	221	52	3.0	7.4	5.1	1.20	0.60	0.32	0.24	36
	Label	217	52	3.2	5.8	5.7	1.5	0.2	0.4	0.90	Trace
	Range	193 250	46 59	2.9 3.1	6.4 8.4	4.6 5.6	1.17 1.23	0.52 0.67	0.28 0.37	0.21 0.28	34 38



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Products	Values	Energy KJ/100g	Energy Kcal/100g	Protein	Total Carbohydrate	Total Sugars	Total Fat	SFA	MUFA	PUFA	Sodium (mg/100g)
Tesco Healthy Living - Cholesterol Reducing Probiotic Yogurt Drink ^{k, o}	Analysis	286	67	2.4	13.3	8.9	0.53	0.37	0.13	0.01	36
	Label	280	70	2.0	13.5	10.5	0.4	0.4	Trace	Trace	100
	Range	249 323	59 76	2.3 2.5	11.5 15.0	8.1 9.7	0.52 0.55	0.32 0.41	0.11 0.15	0.01 0.01	34 38
Yoplait Essence - Strawberry Flavour - Lower Blood Pressure & Cholesterol ^{a, k, p}	Analysis	220	52	2.2	9.2	6.7	0.70	0.46	0.20	0.02	33
	Label	236	56	2.7	8.6	8.3	1.2	0.8	NS	NS	<100
	Range	192 249	45 59	2.1 2.3	8.0 10.4	6.1 7.3	0.68 0.72	0.40 0.52	0.17 0.22	0.01 0.02	31 35
Yoplait Essence - Strawberry Flavour - Lose Weight ^b	Analysis	307	73	2.3	12.8	10.0	1.3	0.8	0.4	0	39
	Label	302	72	2.7	12.3	11.8	1.3	0.9	NS	NS	<100
	Range	267 346	63 82	2.3 2.4	11.1 14.5	9.1 10.9	1.30 1.37	0.73 0.95	0.35 0.46	0.02 0.03	36 41
Muller - Light Strawberry Fat Free Yogurt ^a	Analysis	223	52	4.2	8.3	4.5	0.3	0.1	0.1	0	62
	Label	215	51	4.1	7.7	7.0	0.1	0.1	NS	NS	100
	Range	194 252	46 59	4.0 4.3	7.3 9.4	4.1 4.9	0.26 0.27	0.11 0.15	0.07 0.09	0.04 0.05	59 66
Lidl - Fresh Meadow Organic Natural Yogurt ^q	Analysis	309	74	4.0	5.9	2.6	3.8	2.5	1.0	0.1	51
	Label	310	74	5.2	4.9	NS	3.5	NS	NS	NS	NS
	Range	269 350	64 83	3.9 4.2	5.1 6.7	2.4 2.9	3.71 3.90	2.18 2.84	0.87 1.13	0.11 0.14	48 54
Lidl - Naturis Natural Yogurt	Analysis	248	59	4.9	7.1	3.5	1.2	0.8	0.3	0	59
	Label	261	62	5.1	6.2	NS	1.5	NS	NS	NS	NS
	Range	216 281	51 66	4.8 5.1	6.1 8.0	3.2 3.8	1.17 1.23	0.68 0.88	0.29 0.37	0.03 0.04	56 62
Onken - Natural Biopot Set Yogurt ^r	Analysis	298	71	3.6	5.7	2.7	3.8	2.5	1.0	0.1	58
	Label	297	71	3.9	5.7	5.7	3.7	2.6	NS	NS	70
	Range	260 337	62 81	3.5 3.8	5.0 6.5	2.5 3.0	3.67 3.86	2.15 2.79	0.90 1.17	0.09 0.12	54 61



Accuracy of Nutrition Labelling of Pre-Packaged Food in Ireland

JULY 2010

Products	Values	Energy KJ/100g	Energy Kcal/100g	Protein	Total Carbohydrate	Total Sugars	Total Fat	SFA	MUFA	PUFA	Sodium (mg/100g)
Lidl - Milbona Raspberry Framboises	Analysis	549	131	5.1	16.6	11.7	4.9	3.2	1.3	0.2	41
	Label	570	136	5.3	17.8	NS	4.8	NS	NS	NS	NS
	Range	478 620	114 148	4.9 5.2	14.5 18.8	10.6 12.7	4.75 4.99	2.76 3.59	1.15 1.50	0.13 0.17	39 43
Lidl - Fresh Meadow Organic Strawberry Yogurt	Analysis	407	97	4.0	13.7	11.4	2.9	1.9	0.7	0.1	47
	Label	422	100	4.3	14.0	NS	2.8	NS	NS	NS	NS
	Range	354 460	84 109	3.9 4.2	11.9 15.5	10.3 12.4	2.80 2.94	1.64 2.13	0.65 0.84	0.09 0.12	44 50
Lidl - Monte Ravy Vanilla Rice Pudding	Analysis	516	122	3.0	21.7	13.5	2.6	1.7	0.7	0.1	59
	Label	534	126	3.4	22.0	NS	2.8	NS	NS	NS	NS
	Range	449 583	106 138	2.9 3.1	18.9 24.6	12.3 14.7	2.54 2.67	1.49 1.93	0.62 0.81	0.05 0.07	56 63
Dunnes - Chicken & Bacon Sandwich Filler	Analysis	1405	339	16.0	5.1	0.5	28.3	3.8	15.6	7.6	466
	Label	1615	391	15.4	1.0	1.0	36.1	3.5	NS	NS	400
	Range	1222 1588	295 383	15.5 16.6	4.4 5.8	0.5 0.5	27.56 28.97	3.27 4.25	13.61 17.67	6.61 8.59	439 493
Low Low - Strawberry Yogurt with Probiotic Bacteria ^a	Analysis	389	92	4.1	16.7	12.1	1.0	0.6	0.3	0.1	56
	Label	400	94	4.3	17.1	16.5	1.0	0.6	NS	NS	70
	Range	339 440	80 104	3.9 4.2	14.6 18.9	11.0 13.2	0.94 0.99	0.50 0.65	0.26 0.34	0.05 0.06	52 59
Dunnes - Probiotic Prune Yogurt ^a	Analysis	323	77	3.9	11.9	7.2	1.5	0.9	0.4	0	50
	Label	328	78	4.2	9.2	6.8	2.7	1.7	NS	NS	40
	Range	281 365	67 86	3.7 4.0	10.3 13.4	6.5 7.9	1.46 1.54	0.82 1.06	0.39 0.50	0.04 0.05	47 53
Rachel's - Organic Devine Rice	Analysis	545	130	3.1	18.0	9.2	5.1	3.2	1.4	0.2	105
	Label	561	134	3.5	19.0	NS	4.9	NS	NS	NS	NS
	Range	474 616	113 147	3.0 3.2	15.6 20.3	8.4 10.0	4.94 5.19	2.82 3.67	1.23 1.60	0.16 0.21	98 111



Accuracy of Nutrition Labelling of Pre-Packaged Food in Ireland

JULY 2010

Products	Values	Energy KJ/100g	Energy Kcal/100g	Protein	Total Carbohydrate	Total Sugars	Total Fat	SFA	MUFA	PUFA	Sodium (mg/100g)
Dunnes Simply Better - Roasted Hazelnut Yogurt	Analysis	706	169	4.2	18.8	16.4	8.5	4.8	3.1	0.3	50
	Label	723	173	3.7	20.3	19.4	8.5	4.7	NS	NS	60
	Range	615 798	147 191	4.0 4.3	16.4 21.3	14.9 17.9	8.32 8.75	4.13 5.37	2.71 3.52	0.25 0.33	47 53
Avonmore - Fresh Soup Classic Cream of Chicken ^s	Analysis	272	65	2.1	4.7	0.7	4.3	1.4	1.5	1.2	268
	Label	316	75	2.2	4.8	1.0	5.2	1.7	NS	NS	260
	Range	237 308	57 74	2.0 2.1	4.1 5.3	0.7 0.8	4.16 4.37	1.24 1.61	1.28 1.66	1.03 1.33	252 283
Avonmore - Fresh Soup Vine Ripened Tomato & Basil	Analysis	204	49	1.2	5.4	3.6	2.5	1.6	0.7	0.1	247
	Label	199	47	1.0	4.7	2.8	2.7	1.7	NS	NS	300
	Range	178 231	42 55	1.1 1.2	4.7 6.1	3.3 4.0	2.44 2.56	1.35 1.75	0.62 0.81	0.10 0.14	232 262
Dunnes - Fresh Tomato Soup ^a	Analysis	173	41	1.0	6.8	3.8	1.1	0.6	0.3	0.1	263
	Label	146	35	0.8	6.3	4.3	0.9	0.5	NS	NS	360
	Range	151 196	36 46	1.0 1.1	5.9 7.7	3.5 4.2	1.04 1.09	0.56 0.73	0.27 0.35	0.06 0.08	247 278
Dunnes - Fresh Chicken Soup	Analysis	161	38	2.1	4.0	0.7	1.6	0.4	0.6	0.5	347
	Label	193	46	2.6	4.9	0.8	1.8	0.4	NS	NS	370
	Range	140 182	33 43	2.0 2.2	3.5 4.5	0.6 0.7	1.53 1.61	0.35 0.45	0.56 0.73	0.40 0.51	326 367



In addition to the outlined general considerations, the following product specific footnotes must be considered when reviewing and/or reporting of data presented in Table 5.

^a Manufacturer has made a nutritional claim. All products making claims complied with the requirements of EU Regulation (EC No.1924/2006)

^b Manufacturer has indicated to the FSAI that the product is de-listed, no longer available on the Irish market or has been reformulated

^c This product is manufactured by Noon Products Ltd (UK AG007 EC) and sold in Lidl stores in Ireland. No other retail stores selling this product in Ireland could be identified by the FSAI. The retailer has indicated that the information presented by the FSAI for declared nutritional information for this product is inaccurate and have further indicated that they have checked products both at warehouse and store level and a different nutritional declaration is given to that presented in the FSAI study

^d The company have indicated to the FSAI that it accepts that the product declaration for CHO is different to the content as analysed. As such the company will test three samples of the product to accurately replicate testing and demonstrate results and adapt pack declaration on the next print run to reflect a more accurate reading

^e The company has indicated to the FSAI that the majority of the sugar content of this product comes from sultanas. This sugar content can vary as with any fruit and is dependent on the ripeness/maturity of the sultana's at harvest. In response to the FSAI findings the company has indicated that it will test three samples of the product to accurately replicate testing and demonstrate results and adapt pack declaration (if required) on the next print run to reflect a more accurate reading

^f The company has indicated to the FSAI that this product fulfils the requirements of EU Regulation (EC No.1924/2006) for the claim of Fat Free "a claim that a food is fat-free, and any claim likely to have the same meaning for the consumer, may only be made where the product contains no more than 0.5 g of fat per 100 g or 100 ml"

^g The company has indicated to the FSAI that High Performance Anion Exchange Chromatography with Pulsed Amperometric Detection (HPAEC-PAD) is more suitable than the Luff School Technique for the analysis of sugars in this product. The Company have also submitted data to the FSAI which corroborates the declared values for total sugars in this product using the (HPAEC-PAD) methodology

^h The company has indicated to the FSAI that the label on this product has changed since the survey was carried out. Levels of SFA are now declared at 1.8g/100g

ⁱ The company has indicated to the FSAI that its results are different to the results of regular independent routine tests conducted in the Netherlands where the product is manufactured. The company has indicated that macronutrient analyses of the product are run annually by an accredited laboratory in the Netherlands and also approximately bi-monthly by the Netherlands Controlling Authority for Milk Products. The company also informed the FSAI that sugars are the only carbohydrate in the product, yet the carbohydrate levels are within specification and the sugars are below, which appears contradictory. In relation to fat and SFA levels, the company has also informed the FSAI that two independent laboratories which monitor the product in the Netherlands have never reported results above <0.1 g fat. These independent laboratories use different methodologies for testing fat than the methodology used by the FSAI which could explain differences in results

^j This product contains the cholesterol lowering ingredient plant stanol in the form of plant stanol ester. Plant stanol ester is comprised of plant stanol and fatty acids esterified to the plant stanol component

^k This product contains plant sterols. As plant sterols are insoluble and don't contribute to the energy values of these foods, stated levels of plant sterols are subtracted from total fat values in the reporting of results. Allowances for the subtraction of plant sterols from carbohydrate content (calculated by difference) were not applied in the reporting of results. See Sections 2.2.1 & 2.2.2 for further details

^l This product contains 2.5% Plant Sterol Esters which is equivalent to 1.6% plant sterols per/100g. The label on this product indicated that the fat declaration excludes 1.6g plant sterols which do not contribute to the energy value. Label for the reduced sugar product declares fibre as "1.8g/100g" and strawberry flavour as "0.9g/100g"

^m This product contains 3.4% Plant Sterol Esters equivalent to 2% plant sterols per/100g of product. The label on this product indicates that the fat declaration excludes 2% plant sterols which do not contribute to the energy value. Label declares fibre as “1.1g/100g”

ⁿ The company has indicated to the FSAI that the fatty acid (sunflower oil) is attached to the plant sterols in this product and has the same energy value as fat and is included in the declared fat level for the product. The company further indicated that the FSAI results for SFA and PUFA are inconsistent with their external laboratory measurements (0.4g/100g & 1.6g/100g respectively) and inconsistent with the fatty acid profile of the sunflower oil ester. In relation to CHO the company have indicated that they declare a calculated CHO level of 5.8/100g on the pack which is consistent with their external laboratory measurements (5.9g/100g)

^o This product contains 1.8% Reduol (Plant Sterols) per/100g. The label on this product indicated that the fat declaration excludes sterols. Label declares fibre as “0.5g/100g”

^p This product contains 1.3% Plant Sterols per/100g. The label on this product does not indicate if the fat declaration excludes 1.3% plant sterols or not. Label declares fibre as “0.4g/100g”

^q The company has informed the FSAI that they have contacted the supplier of this product and based on the recommended 20% tolerance of the labelled protein and CHO a range of 4.16 - 6.24 and 3.43 - 6.37 respectively, would be acceptable. Supplier analysis of the product indicated that protein and CHO are within the recommended tolerance. The Company indicated that the analysis values from the FSAI were not traceable because whole milk has 4.8% CHO and 3.3% protein. The higher level of protein and CHO in yogurt is a result of yogurt-processing (increasing the dry matter with milk powder). With the added milk powder protein and CHO increases. However, the CHO of milk reduces during the process due to fermentation of lactose to lactic acid. Additionally, the company informed the FSAI that these products are subject to independent laboratory analysis and that in Germany a non-legally binding nutrition abnormality of 15% is acceptable

^r The company has indicated to the FSAI that new packaging for this product declares sodium at a level of 60mg/100g

^s The company has indicated to the FSAI that this product was reformulated at the time of the FSAI survey to reduce the fat content to 3.5g per 100g. The current pack label declares the fat content at this level

^t The company has indicated to the FSAI that its policy is for full external accredited laboratory analysis on a minimum of five batches of product as part of its NPD process or existing product reformulation. An average of these values is then taken (unless there is a significant degree of variation) for the declared nutritional information. The company has further indicated that this product has not been reformulated since 2006. However, as soya beans are a natural plant product, the quality and quantity of protein will vary slightly throughout any one year. It is for this reason that the company declares on its packaging “nutritional values are approximate due to the variations which occur in natural ingredients”.

^u The company has indicated to the FSAI that results of their independent laboratory analysis for sugars do not concur with the FSAI results. The company has stated that the composition of seasonal raw materials such as organic milk will vary depending on the stage of lactation. As per standard industry practise the company calculates sugar content from established published data for milk and from the nutritional data supplied by its ingredient suppliers. The margin of error allowed by the company is 20% and as such this can lead to errors with the system as established

NS = Not Stated



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