Nutrition & Food Chemistry

Today's consumers are increasingly interested in what they eat and require information that is accurate and easy to understand. It is advisable in all circumstances, and a legal requirement in some, for food manufacturers to exploit the "on pack" opportunity to inform the consumer.

Premier Analytical's Comprehensive Nutrition Service ensures accurate "on pack" information for your consumer.

Premier Analytical Services is one of the leading food testing centres in Europe, can supply you with a service that is designed to provide comprehensive support in this area delivering the highest value for money by offering:

- Consultancy advice
- Comprehensive scope of UKAS accredited analyses
- Fast, reliable results and interpretation.

You can rely on our advice and analytical results to provide accurate information for your consumers.

You can be confident that as one of our customers we will help you to implement the most appropriate testing regime.

You can use our service to monitor your products with regard to any Nutrition Claims that are made.

The Comprehensive Nutrition Service from Premier Analytical Services provides information on which you and your consumers can rely.

Mandatory Nutrition Labelling

What the numbers mean and advice on any course of action that may be required – providing you with a Comprehensive Nutrition Service.

Information must be declared per 100g 0r 100ml of the food. Or per portion, with the number of portions in a pack listed.

Mandatory Nutrition

	UKAS Accredited
Mandatory Nutrition Declaration	
Mandatory Nutrition Declaration new format:	
ENERGY by calculation	Yes
FAT by analysis	Yes
SATURATED FATS by analysis	Yes
CARBOHYDRATE by calculation (or difference)	Yes
SUGAR PROFILE by analysis	Yes
PROTEIN by analysis	Yes
SALT by Sodium (by analysis)	Yes
Measured for calculation but not declared on pack:	
MOISTURE by analysis	Yes
ASH by analysis	Yes
DIETARY FIBRE by analyis (AOAC method)*	Yes

*Please note that if it is opted to declare Fibre it is positioned above Protein in the list. It is only mandatory for this to be tested and declared in products making a nutrition or health claim about fibre or energy although EC guidelines are that Products containing 3% or more of fibre should include it in the testing to enable accurate calculation of Energy values. Most foods contain <3g/100g of fibre, the main exceptions are many cereals and pulses and products containing high levels of these. In practice most manufacturers are still including it in the testing and declaring on pack.

Please refer to the UKAS Schedule of Accreditation for the specific matrices.

Mandatory Nutrition as Individual Analyses

		UKAS Accredited	Lower Reporting Limits
Moisture/Dry Matter			
Loss on Drying (Moisture by Oven drying @102^{0}C for a minimum of 14 hrs)		Yes	0.1g/100g
Moisture of Wheat products (Flour), by oven drying @ 130^{0}C for 2 hrs		No	
Moisture of Heterogeneous (Bakery) products with a high moisture content		Yes	
Dry Matter in High sugar samples, by vacuum oven drying @ 70^{0}C		Yes	
Ash			
By incineration in a muffle furnace @ 500°C		Yes	0.1g/100g
Crude protein			
Kjeldahl	measures organic nitrogen	Yes	0.1g/100g
Dumas	measures total nitrogen	Yes	0.1g/100g
Sugars Profile (Mono and disaccharides / Total Sugars)			
By HPLC	Fructose + Glucose + Lactose + Maltose + Sucrose using HPLC	Yes	0.1g/100g (per sugar)
By Ion-chromatography with pulsed amperometric detection IC-PAD (more sensitive)		No	0.01g/100g
Fat			
Total Fat	Total Fat by ICC (acid hydrolysis and liquid-liquid extraction)	Yes	0.1g/100g
Total Fat	Total Fat by NMR	Yes	
Total Fat by Soxhlet (lipid extractable by solvent)		No	
Fatty acids Composition of a fat (Saturates, monounsaturates, polyunsaturates & trans fatty acids) AKA Total Fatty Acids (TFAs)	Fat sample	Yes	1% of fat phase of sample
	Non fat samples requiring fat extraction	Yes	
Omega 3 & Omega 6 Fatty Acids		Yes	

Hydrogenated Vegetable Oil	Trans fatty acids and fatty acid profile assessments	No	
Trans fatty acids are a key indicator of partial hydrogenation of a fat. Determination of the presence of partially hydrogenated fats in a foodstuff can therefore be determined by analysis to determine the level of trans fatty acids in a foodstuff. However the presence of trans fatty acid alone will not confirm evidence of hydrogenation as low levels of trans acids can be formed in normal thermal processing of foodstuffs. We therefore analyse for the presence of trans fatty acids and interpret the trans levels along with the fatty acid profile to determine presence hydrogenated fats.			
Dietary Fibre			
Total Dietary Fibre	by AOAC method	Yes	0.1g/100g
Soluble fibre	by AOAC method	Yes	0.50%
Insoluble fibre	Need to do Total, Soluble and Insoluble as Q/C	Yes	
Soluble & Insoluble fibre	by AOAC method	Yes	
Sodium			
by AA		Yes	LOD 3.4 ppm LOQ 4.8ppm
Available Carbohydrate			
Old Group 1 Nutrition is performed (Protein, Fat , Moisture & Ash are measured)- subtracted from Carbohydrate to give Available Carbohydrate	Carbohydrate is calculated by difference – Dietary Fibre is measured and	Yes	
Nutrients/Constituents that if present must be measured & included in the energy calculation			
Polyols (alcohol sugars sorbitol, mannitol, maltitol, lactitol & xylitol)	HPLC (capability is sample matrix dependent as it may not be possible to differentiate analytes from inherent interference)	No	0.1%
Alcohol (Ethanol)	by GC with aqueous extraction	Yes	0.1% (Upper reporting limit 5%)
Organic acids (Organic anions by HPLC)	Citric acid + Isocitric acid + Malic acid + Tartaric acid	Yes	50ppm

Please refer to the UKAS Schedule of Accreditation for the specific matrices.

Other Major Nutritional Components

		UKAS Accredited	Lower Reporting Limits
Meat content – by Chemical analysis	By Stubbs & Moore calculation based on analysis of Fat, Moisture, Protein & Ash on meat portion of the product	Yes	N/A
Meat content – by separation	By mechanical separation and weight measurements	No	N/A
pH		Yes	
Specific gravity / Density		No	
Chloride, water soluble	For Salt by Chloride	Yes	0.01g/100g
Cholesterol	by GC/MS	Yes	50mg/Kg
Fructans (Oligofructose & Inulin)	Using AOAC method 997.08 (We cannot distinguish between oligofructose and inulin)	Yes (Bakery & Dairy Food Types)	0.5g/100g
Short chain length oligomers	Glucose oligomers by HPLC	No	
Sugars by refractometry (Brix)		No	
Starch glucose	using acid hydrolysis	No	

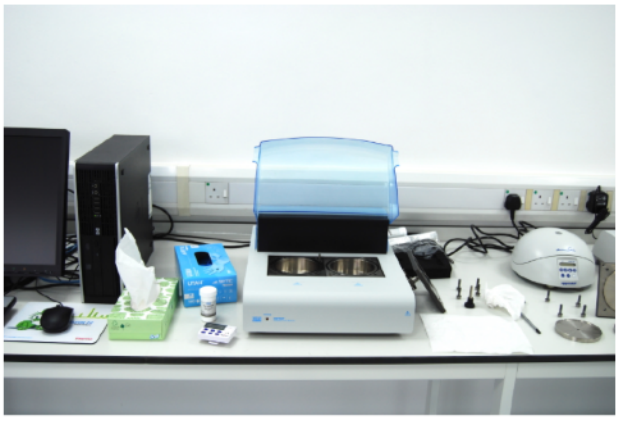
Please refer to the UKAS Schedule of Accreditation for the specific matrices.

Other Minor Nutritional Components

		UKAS Accredited	Lower Reporting Limits
Alcohol content (grape musts, wine etc)	Specific gravity	No	
Beta Glucans	Megazyme mixed linkage Beta Glucans test – Oat and Barley Beta glucans in cereals and cereal based products ONLY	No	
Caffeine		Yes	100 mg/kg
Capsaicin in spices	HPLC (X16 for Scoville Value)	No	
Chlorinated lipids in foods containing chlorine treated flour		No	
Free Amino Acids	**Suite contains the following free amino acids:**		LODs (mg/kg) as follows:
	Alanine Ala (A)	Yes	3.2
	Asparagine Asn (N)	Yes	4.1
	Aspartic acid Asp (D)	Yes	7.5
	Glutamic acid Glu (E)	Yes	5.3
	Glutamine Gln (Q)	Yes	4.7
	Glycine Gly (G)	Yes	2.9
	Isoleucine Ile (I)	Yes	3.7
	Leucine Leu (L)	Yes	3.7
	Phenylalanine Phe (F)	Yes	5.8
	Serine Ser (S)	Yes	3.6
	Threonine Thr (T)	Yes	4.1
	Tyrosine Tyr (Y)	Yes	6.3
	Valine Val (V)	Yes	3.4
Monosodium Glutamate	NB we cannot distinguish amino acid from its sodium salt. We measure Glutamate and express it as MSG	No	
Inorganic anions by HPLC (Sample matrix dependant)	Nitrate	No	10 mg/kg
	Iodide	No	10 mg/kg
	Phosphate	No	10 mg/kg
	Sulphate	No	10 mg/kg
Nucleosides & Nucleotides in yeast, flavourings & fermentation liquors	Nucleosides= Adenosine/ Cytosine/ Guanosine/ Inosine Uridine Nucleotides= Adenosine monophosphate AMP/ CMP/ GMP/ IMP/ UMP	No	
Osmolality in drinks (also Milk Freezing Point Depression)		No	
Phospholipids		No	
Phytic acid		No	
Purines (total) & Pyrimidines (total)	Purines= Adenine/ Guanine/ Hypoxanthine/ Inosine/ Xanthine Pyrimidines= Cytosine/ Uracil	No	
Quinine in soft drinks		No	
Titratable acidity	Expressed mainly as acetic or citric acid but could be others	Yes	

Please refer to the UKAS Schedule of Accreditation for the specific matrices.

Oxitest



PAS can offer innovative analysis via a new instrument called an 'Oxitest' that measures resistance to oxidative rancidity under accelerated conditions at 90°C and elevated pressure in an oxygen atmosphere. The instrument measures an 'Induction period' (the time taken for antioxidant protection to fail and oxidation to accelerate) and this is a very useful for comparing the potential shelf-life of samples.

The way we plan to use the Oxitest 'Induction Period' measurement is not so much the actual result at any time point (though this is useful to show differences between your two variants of similar products straightaway), but to follow the reduction in IP with incubation time/life of sample. A fall in IP is seen under accelerated shelf life conditions, which will allow a clear indication of the end of life (when IP approaches zero) and may allow an early prediction of when the end of life will occur.

Accelerated Shelf Life Testing

What is it?

Physically altering an extrinsic parameter, such as storage temperature, in order to assist agents of product deterioration.

How is it performed?

Most often storage temperature is maintained at a higher level with the aim of improving microbial growth kinetics.

When do you do it?

When shelf life evaluation is required within a reduced timeframe compared to the target shelf life.

Pros

Application restricted to scenarios wherein product intrinsics are thermo-stable and the hazard organisms are known to occur at low temperature but their growth kinetics are increased at elevated temperature such that an early warning can be given regarding product stability.

Cons

The alteration of an extrinsic parameter gives a false representation of the product profile such that intrinsics may change. The potentially problematic microbial population may not be suited to development in this altered environment such that resultant lack of growth could impart a false sense of security. Additionally cascade effects at lower temperature could be missed.

Consultancy & Advice

Following publication of the new European Food Information Regulation (EU) No 1169/2011, nutrition labelling becomes compulsory in the UK and throughout the EU for nearly all pre-packed foods for sale retail or to a caterer from 13th December 2016.

This new Regulation also changes the format that must be used for nutrition labelling of foods in the EU – all foods produced from 13th December 2014 must comply with the new rules.

The rules for making nutrition or health claims on foods in the EU have also recently undergone major changes and continue to evolve.

Nutritional labelling is a complex area wherein the potential for error is very high. Premier Analytical Services's consultants can help you to get it right first time with advice that will answer questions such as:

What nutrition labelling rules apply to your particular food product?

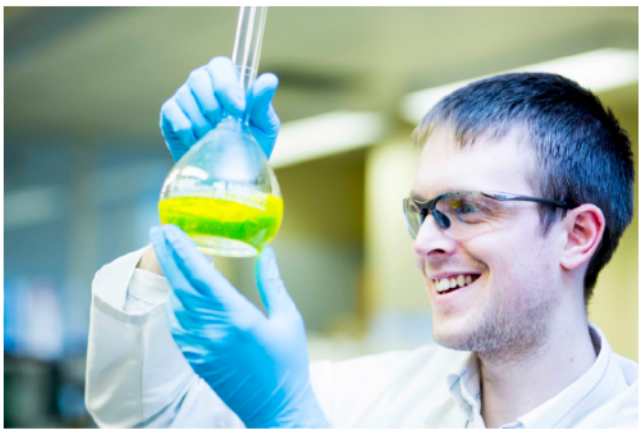
Do the claims you make on pack or in advertising fall within the scope of the Nutrition & Health Claims Regulation – how does this affect the nutrition declaration?

What should be included in the declaration and what format and layout should be used?

What do you do about nutrients not listed in the regulations or for which there are no conversion factors?

What are the different requirements for vitamins and minerals as well as PARNUT foods?

What is the correct and best way to derive the information for the declaration?



Information Deviation

Information should be based on:

- Calculation from known or actual average values of the ingredients used OR
- Calculation from generally established and accepted data OR
- Analysis. The method of derivation preferred by the major manufacturers, retailers and food industry authorities.

Calculation

If this is your preferred approach the experts at Premier Analytical Services can carry out calculations on your behalf or assist you to select and perform the most appropriate calculation.

Analysis

At the heart of our service is the full range of tests required to derive all the information needed to make accurate nutrition declarations. All of our analyses in this area are accredited by UKAS to the ISO 17025 standard. As such you can rely on the results and be confident that the declarations you are making on your products are a true representation that can in turn be relied upon by your consumers.

Interpretation

What the numbers mean and advice on any course of action that may be required – providing you with a Comprehensive Nutrition Service.