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Setting of nutrient profiles for accessing nutrition and health claims: proposals and arguments

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[1] *Until June 2007*
[2] *Until December 2005*

LIST OF ABBREVIATIONS

ALA: alpha-linolenic acid
AS: added sugars TS: total sugars
CES: Scientific panel
DE : energy density
DG Sanco: Directorate General for Health and Consumer Protection
DHA: docosahexaenoic acid
DQ: diet quality index
EAR: estimated average requirement
FA: fatty acid
FIDM: fat in dry matter
FSA: Food Standards Agency
HAC: Hierarchical Ascending Classification
ILSI: International Life Science Institute
INCA: Enquête individuelle et nationale sur les consommations alimentaires - Individual and national survey on food consumption
INPES: Institut National de Prévention et d'Education pour la Santé (National Institute for Prevention and Health Education)
LIM: limited nutrient score
MUFA: monounsaturated fatty acid
ND: nutrient density
NP: nutrient profile
PCA: principal component analysis
PRI: population reference intakes
PUFA: polyunsaturated fatty acid
RDA: recommended dietary allowances
SAIN: score d'adéquation individuel aux recommandations nutritionnelles (Nutrient density score)
SFA: saturated fatty acid
TEI: total energy intake
WG: working group
WHO: World Health Organization

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REPORT SUMMARY

Communication on food cannot merely feature the links between a substance and physiological functions or the development of diseases, however strong these may be. The overall nutritional quality of the food bearing this information must be taken into account for. Although difficult to assess, the overall nutritional quality of each foodstuff consumed is currently one of the tools for meeting nutritional recommendations.

In this context, Afssa has initiated a working group on the scientific data which may be used for setting nutrient profiles under the provisions of the European regulation on nutrition and health claims.
Afssa's expert assessment is based on a critical review of the main existing nutrient profiling tools as regards the criteria identified by the European regulation for setting nutrient profiles.
This work has led to the proposition of an original nutrient profiling scheme, based on pre-existing notions: SAIN and LIM scores.

The system is across-the-board , i.e. identical for all foods, combining 2 complementary, non-compensatory scores:

- the SAIN, or nutrient density score, is the mean of percentages of recommended dietary intakes for a defined number of qualifying nutrients;
- the LIM, or limited nutrient score, is the mean of percentages of maximum recommended intakes for a defined number of disqualifying nutrients.

The SAIN and LIM scores obtained for a given foodstuff, reflecting the nutrient density and energy density respectively, are then compared to reference values.
The conditions for bearing claims are discussed by taking the SAIN threshold reference value as a minimum value to reach and the LIM reference value as an upper limit that should not be exceeded.
With this system, the derogation provided for by the regulation can be applied when a nutrient exceeds the required profile for bearing claims.

This nutrient profiling system has been tested on over 600 food items listed in the Food Quality Information Centre (Ciqual/Afssa) food composition table. Based on the criteria set, more than a third of the food items were classified as eligible to bear health claims (particularly 80% of fruit and vegetables, unrefined starchy foods, 50% of products in the meat/egg/fish category, low-sugar and low-fat fresh dairy products and milk) while more than a quarter of food items were classified as not eligible for bearing a nutrition or health claim.
Although, overall, these results can be considered to be in line with the nutritional recommendations, some misclassifications may be resolved by defining food categories derogating from the across-the-board system. Indeed, some food categories, such as oils, have been identified as requiring a specific method for defining nutrient profiles. The system has been adapted to their nutritional characteristics by considering optional nutrients when calculating the scores.

Building on these encouraging initial findings, additional research is necessary to refine the consideration of essential criteria, particularly the concept of weighting the nutrients selected, dietary habits and food consumption levels and by validating the system through consumption data.

1 CONTEXT

The existence of links between diet and health is now well documented. Diet not only helps to prevent a number of chronic diseases but is also a risk factor in the incidence of some diseases.
The characterisation of foodstuffs and different dietary habits in terms of their public health impact is a key focus of public health policies.
This characterisation must be systematic, based on scientific data, the nature of which depends on the objective pursued. The concept of nutrient profiling can be used in this regard.

Afssa has begun discussions on nutrient profiles in the framework of:

- European deliberations on the definition of nutrient profiles as a criteria for accessing nutrition and health claims, such as provided for by Regulation (EC) No 1924/2006 on nutrition and health claims made on food;
- the request of the consumers' association UFC-Que choisir (Annex 1) based on the principle that the nutrient profile concept is "worth using as a basis for setting up a global nutrition policy" and asking for:
    - a comparison of existing profiling models;
    - guidelines for the setting of nutrient profiles (NPs).

2 METHOD

2.1 Working method

To respond to this request, Afssa set up a working group (WG) which analysed:

- existing profiling systems from the bibliography;
- reports and papers on nutrient profiles conducted by other institutions;
- Afssa's reports and opinions that developed tools whose concept is similar to the NP one.

The group based its discussions on this critical review when making choices for its original work. This original work led to a nutrient profiling system that may be put forward as French contribution to European exchanges organised to meet the request of the Directorate General for Health and Consumer Protection (DG Sanco)[3].

Scientists from the public and private sectors who have developed nutrient profiling tools were consulted.

Since the analysis of nutrient profiling tools has been the subject of various French and European reports and articles published, this work focuses specifically on Afssa's proposal as regards the questions raised by the DG Sanco.

The WG's conclusions were adopted by the "Human nutrition" Scientific Panel (CES) in two stages: firstly on 26 October 2006 regarding the general principle of the nutrient profiling scheme proposed, then on 29 March, 24 May, 19 June 2007 and 24 April 2008 regarding the criteria for accessing claims.

2.2 General principles

It was essential to refocus Afssa's deliberations on the setting of NPs as conditions for bearing nutrition and health claims in the context of the general framework of nutritional recommendations.

Nutrition is above all a matter of balance and diversity. It is the combination of complementary foods that allows all our nutritional needs to be covered. This overall nutritional balance can be achieved in various ways, consistent with dietary cultures and preferences, whether they be individual or collective. That said, the concept of a functional food behind the use of claims implies that some foods contribute more than others to reaching this balance. The application of NPs aims to improve the quality assessment of these foods so as to identify them easily in a precise and reproducible manner. Nutrient profiles do not aim, in any case, to promote all of the food available through claims.

Nutrient profiles defined for the regulation of claims must consider the role of individual foods in the overall diet. The aim is to estimate the potential of each food to affect overall dietary balance, considering its specific characteristics. Consequently, nutrient profiling does not consist in compiling "healthy" and "unhealthy" food groups.

Claims are currently considered to be effective marketing tools. Studies show that nutrition and health claims are a decisive purchase criterion for most consumers (Marquart et al., 2001, DGAL/CLCV, 2004). It is therefore necessary that the consumption of products promoted through claims is not likely to lead to dietary imbalance. Accordingly, nutrient profiling must integrate public health objectives, particularly those translated into nutritional recommendations. When validating the proposed system, it is therefore necessary to ensure that foods whose consumption is encouraged do indeed have the required NPs for bearing claims.
However, irrespective of the system chosen, some foods not subject to recommendations or foods that must be consumed only occasionally may be eligible for bearing claims.

[3] European Commission request to the European Food Safety Authority for scientific advice on : the setting of nutrient profiles pursuant article 4 of Regulation 1924/2006 on nutrition and health claims made on foods (http://www.efsa.europa.eu/en/science/nda/requests___mandates.html)

3 NUTRIENT PROFILES: DEFINITIONS AND USE

3.1 Contextual elements of European Regulation (EC) No 1924/2006[4]

Afssa recalls the recitals and articles of the European Regulation on the issue of NPs.

Preliminary recitals

Recital 10

"Food promoted with claims may be perceived by consumers as having a nutritional, physiological or other health advantage over similar or other products to which such nutrients and other substances are not added. This may encourage consumers to make choices which directly influence their total intake of individual nutrients or other substances in a way which would run counter to scientific advice. To address this potential undesirable effect, it is appropriate to impose certain restrictions as regards the products bearing claims. In this context, factors such as the presence of certain substances, or the nutrient profile of a product, are appropriate criteria for determining whether the product can bear claims. […]"

Recital 11

"The application of nutrient profiles as a criterion would aim to avoid a situation where nutrition or health claims mask the overall nutritional status of a food product, which could mislead consumers when trying to make healthy choices in the context of a balanced diet. […] »

Recital 12

"The establishment of nutrient profiles should take into account the content of different nutrients and substances with a nutritional or physiological effect, in particular those such as fat. […]"

Article 4

" […] The nutrient profiles for food and/or certain categories of food shall be established taking into account in particular:

a) the quantities of certain nutrients and other substances contained in the food, such as fat, saturated fatty acids, trans-fatty acids, sugars and salt/sodium;

b) the role and importance of the food (or of categories of food) in the diet of the population in general or, as appropriate, of certain risk groups including children;

c) the overall nutritional composition of the food and the presence of nutrients that have been specifically recognised as having an effect on health.

The nutrient profiles shall be based on scientific knowledge about diet and nutrition, and their relation to health.

[…]

By way of derogation […], nutrition claims:

a) referring to the reduction of fat, saturated fatty acids, trans-fatty acids, sugars and salt/sodium shall be allowed without reference to a profile for the specific nutrient/s for which the claim is made, provided they comply with the conditions laid down in this Regulation;

b) shall be allowed, where a single nutrient exceeds the nutrient profile provided that a statement about the specific nutrient appears in close proximity to, on the same side and with the same prominence as the claim [...].".

[4] Regulation (EC) No 1924/2006 of the European Parliament and of the Council of 20 December 2006 on nutrition and health claims made on foods

3.2 Definitions adopted in the report

Afssa has adopted the following definitions:

- **nutrient profiling is the classification of foods on the basis of their nutritional composition;**
- **the nutrient profile of a food item is an overall expression of its nutritional quality;**
- **classification is the grouping of foods following the application of a nutrient profiling scheme;**
- **categorisation is the grouping of foods according to predefined criteria that may be regulatory, nutritional or customary.**

Possible uses of nutrient profiling are various and include:

- use of nutrition or health claims by manufacturers and supermarket professionals and their control by the regulatory authorities (Regulation (EC)No 1924/2006);
- control of access to advertising, particularly on television, or access to automatic vending machines, provided that specific regulations exist;
- advice on raw material and recipe choices from catering staff;
- personalised nutritional advice provided by nutritional professionals, dieticians and nutritional doctors.

Afssa's considerations are focused on setting NPs for the regulation of claims.

This Regulation foresees that the following elements be addressed when setting NPs:

1. the setting of NPs for food in general and/or categories of food;
2. the choice and balance of nutrients to take into account;
3. the choice of reference basis/quantities;
4. the NP calculation approach;
5. the feasibility and testing of the proposed system.

Afssa has chosen to use the terminology "qualifying/disqualifying nutrients" which is specified in the NP topic:

- **a qualifying nutrient is one whose consumption is to be encouraged and for witch certain content in the food will help the NP required to be reached;**
- **a disqualifying nutrient is one whose consumption is to be limited and for which too high a content will hinder the obtainment of the NP required.**

4 REVIEW OF THE KEY CRITERIA OF NUTRIENT PROFILES

The definition of NPs is closely tied in with the public health objectives identified for populations. These objectives can vary from one country to another: prevention of obesity, particularly child obesity, cardiovascular diseases or diseases caused by ageing, etc. The scheme proposed will enable the tool to be adapted in line with these variations through the choices of nutrients and their relative weights which are considered when calculating NPs.
The criteria that must be considered when setting NPs are analysed in this chapter. These are:

- model type;
- nutrients used when calculating the NPs;
- reference base;
- NP calculation method;
- method for validating the scheme proposed.

4.1 Different types of model

There are 3 nutrient profiling models: across-the-board, category-based and combined. The strengths and weaknesses of these systems, recalled in this chapter, are known (Tetens et al., 2006).

4.1.1 Across-the-board system

A system “across-the-board” sets NPs for food in general. The major strength of these systems is that they overcome the problem of defining and managing food groups.

The same criteria are used to define the NPs of foods that can be intrinsically different. This characteristic implies setting up a complex system that has to take account of the diverse nutritional compositions of food products.
Such a system may also lead to the exclusion of certain foods almost exclusively containing a single macronutrient (such as oil) from access to claims, due to a high content of disqualifying nutrients, when some of these foods contribute to essential nutrient intake. This is the case for vitamin E for example, the main source of which is vegetable oils.
Furthermore, these exclusions may also concern food groups whose characteristics do not match the profile required to bear claims, irrespective of nutritional composition innovations. And yet, recital 11 of the European Regulation states “[…] However, profiles should also allow for product innovation and should take into account the variability of dietary habits and traditions, and the fact that individual products may have an important role in the context of an overall diet.”

Such a system has been set up by the Food and Drug Administration (FDA, 2002) and the Food Standards Agency (Rayner et al, 2005).

4.1.2 Category-based system

A “category-based” system defines specific NPs for predefined food groups (such as “fruit and vegetables”, “dairy products”, etc.). These systems can be complete, categorising all foods, or partial, only taking certain categories of food into account.

They take account of the large inherent differences in the nutrient composition of different food groups, and address the issues related to consumption habits (portion sizes, frequency of intake, pattern of consumption, etc.). No category is excluded, in principle, from access to claims, allowing for product innovation.

However, these systems require the prior definition of categories, a complex task based on various parameters (nutritional composition, national or regional dietary habits). Moreover, the use of categories based on ingredient or food-based criteria requires the management of changes over time, relative to innovation and nutritional composition modifications. Categories also address the issue of border products, with the shifting of a product from one category to another, depending on its ingredients or recipe. For example, certain ready meals can be based on various recipes integrating varying amounts of fruit and vegetables or fat, and consequently leading to various amounts of qualifying and disqualifying nutrients.
Lastly, the number of profiling schemes to be determined depends on the number of categories used.

A category-based nutrient profiling system has been developed in Belgium (NFHP, 2007).

Two categorisation methods can be considered: descriptive categorisations and analytical categorisations.

Descriptive categorisations
These systems describe food categories on the basis of products with similar characteristics. This is the most commonly used categorisation method. The categorisation criteria are variable and can be combined. The criteria used can be the origin (animal, plant, mineral), consumption habit (breakfast, ready meals, sauces), technologies (raw products, processed products) or nutritional characteristics.

These categories comprise regulatory categories (customs, *Codex Alimentarius*), categories used for food consumption surveys and epidemiological studies (Individual and national enquiry on food consumption/INCA, European Food Grouping [Ireland et al, 2002]), categories used in food composition databases (Ciqual, Eurofir [EUROFIR, 2006]) or categories used for nutritional education (INPES).

Regardless of the categories selected, some foods can be difficult to categorise, raising the issue of border products:
- "ready meals" are often used as a category, without any precise definition proposed. Such a category can be justified by the food supply and by current consumption trends;
- drinks are considered as a separate category for which several criteria must be defined, such as percentage of water and other ingredients making up "liquid foods" (milk, fruit juice, soup, etc.);
- dried fruits and nuts whose high energy density (ED) clearly sets them apart from other fruits;
- product substitutes (for example soy "milk") can belong to the category of the substituted product (dairy products) or the category of the product used for this substitution (soy-based products).

Analytical categorisations
Mathematical methods can be implemented to categorise foods in a systematic or automatic manner depending on their nutritional characteristics, defined in ingredient or nutrient terms. Unlike descriptive categories, there are no examples of analytical category use by industrial, commercial or legislative sectors for the time being. Research is being conducted on this approach that could partially resolve border issues between categories. That said, it does require a complex calculation programme, making it less easy to implement than the descriptive method.
Setting up such a categorisation system requires prior agreement on the analytical technique used, the nutritional composition database and the nutritional criteria to be adopted in the analysis.

The ingredient-based approach needs a precise definition of the ingredients to be considered, which vary from purified chemical molecules to raw foods (milk, egg, etc.).

In the nutrient-based approach, three methods can be considered:
- *definition of a theoretical average food* in each category (Gerbaulet et al., 2005): each category is characterised by an "average" food whose nutritional composition is the mean nutrient content of the foods in the category. A new food is allocated to the category with the most similar average food;
- *discriminant analysis*: based on a consensual categorisation of some foods, a discriminant analysis determines the nutritional variables which best discriminate the categories. The model obtained could enable the probabilities that a new food will belong to each category to be calculated. This approach is a proposal that has not been tested to date;
- *Principal Component Analysis (PCA)* followed by *Hierarchical Ascending Classification (HAC)* groups foods on the basis of their nutritional characteristics. This technique has been used by Afssa as part of its original work (see Chapter 5).

4.1.3 Combined systems

Combined nutrient profiling systems can also be considered on the basis of either an across-the-board or food category-based system.

With this system, a NP is defined for all foods. Then, depending on the classification results, adaptations are made in certain categories based particularly on expert judgement, depending on the misclassifications observed.

A combined nutrient profiling system has been developed in Sweden (SNF, 2005).

4.2 Type of nutrients

The selection of nutritional criteria to consider in the nutrient profiling scheme can be based on several approaches, differing in the number and nature of nutrients selected. This involves making a choice between the almost exhaustive consideration of nutrients making up the nutritional composition of the food and a targeted description with a limited number of nutrients, but with the risk of not reflecting the overall nutritional characteristics of the food.

The almost exhaustive description of the nutritional composition of the food may include all the nutrients for which an intake recommendation has been defined, or even all the components of the food.

An alternative would be the selection of all nutrients for which scientific data are highly consensual and convincing evidence is identified in nutritional risks and benefits. The objective is to determine the number and nature of nutrients that give the most relevant nutritional description of a food in public health terms. This involves identifying nutrients for which intakes might exceed recommended levels (disqualifying nutrients) and nutrients for which intakes might be inadequate in relation to recommended levels (qualifying nutrients).
The list of these nutrients may be defined on the basis of the recommendations of the World Health Organization (WHO) (WHO, 2003) or Eurodiet (EURODIET, 2000) and the available scientific literature. An initial proposal of a list of nutrients to consider as a priority could be:

- regarding disqualifying nutrients:
  - energy;
  - total lipids;
  - saturated fatty acids (SFAs);
  - trans fatty acids (FAs);
  - sodium;
  - simple carbohydrate (SC);
- regarding qualifying nutrients:
  - fibre;
  - (complex) carbohydrate;
  - polyunsaturated fatty acids (PUFAs) or omega 3 fatty acids;
  - calcium;
  - iron;
  - vitamin B_9;
  - vitamin E;
  - etc.

The methodologies developped in Afssa's reports on fortification (AFSSA, 2001, AFSSA, 2004) can justify this selection.
In a category-based approach, some of these nutrients would not be taken into account because the foods considered contain none or negligible quantities of them (fibre in fat for example).

4.2.1 Selection of disqualifying nutrients only

This approach is, in principle, the simplest and seems in line with European legislation, focusing on the need to prevent the consumption of foods bearing claims from causing nutritional imbalance. Nevertheless, a diet may be considered to be unbalanced not only because it leads to high intakes of disqualifying nutrients but also because it contains inadequate quantities of qualifying nutrients.

4.2.2 Consideration of qualifying nutrients and disqualifying nutrients

The European Regulation aims "to avoid a situation where nutrition or health claims mask the overall nutritional status of a food product, which could mislead consumers when trying to make healthy choices in the context of a balanced diet." (Recital 11). On this basis, and considering the "overall

nutritional status of a food", the definition of an NP must integrate the nutrients whose consumption is promoted (qualifying) as well as those whose consumption is to be limited (disqualifying).

Most systems that take both qualifying and disqualifying nutrients into account produce a final overall score with generally a compensation between qualifying and disqualifying nutients. This characteristic would imply the existence of compensation phenomena at the physiological level, between these nutrients. This phenomenon can be described as the situation when 2 nutrients act in the same physiological or physiopathological processes, one in a beneficial way and the other in an adverse way regarding health. However, this phenomenon has only been proven in a very partial, non-quantitative way for certain nutrient couples exclusively.
Yet, given the few data available, the consideration of physiological and/or physiopathological compensation phenomena between qualifying and disqualifying nutrients would be premature when calculating NPs.

4.2.3 Criteria for choosing nutrients

a) Scientific criteria
The objective is to determine an optimum number of nutrients leading to the most relevant discrimination between foods. Recent work shows that the fewer the qualifying nutrients are, the more the profile correlates to the energy density (Drewnowski et al., 2008b).

Weighting
Choosing to take into account a nutrient in the calculation of the NP is a way of weighting (coefficient 1 or 0) since prioritisation is introduced into the NP calculation. However, the allocation of the same weight to all nutrients included in the calculation of a food's NP (in the hypothesis of an across-the-board approach) is an option by default which may be reviewed in the light of scientific knowledge on the positive or negative contribution of each nutrient on health. This effect could be measured with an index, such as the gain of healthy years of life assessed by QALYs and DALYs indicators [Guevel et al., 2008] or on the basis of a priority ranking of the recommendations. Moreover, the coefficient attributed to each nutrient in the NP calculation could be determined on the basis of discrepancies between observed intake and recommended intake and the health impact of these imbalances.
However, the feasibility of taking this weighting into account is low, given the lack of scientific data on the quantitative comparison of different nutrients' effects on health and given the absence of consensus on this issue.

Ubiquity
Some nutrients, such as proteins, potassium or vitamins B_2 and B_6, are called ubiquitous because they are present in many foods of varied origins.
Others, however, such as DHA, ALA or vitamin D, are only present in some foods. These different distributions of nutrients in foods imply that non-ubiquitous nutrients should be considered as a priority in category-based profiling systems. They will also be considered for the definition of possible specific profiles in across-the-board systems.

Nutrient markers
The qualifying nutrients selected when calculating the NP can be markers of the presence of other substances that also present a public health interest, but for which there is not nutritional reference value to date. This is the case for vitamin C and fibre, for example, which are markers of other substances present in plants, such as beta-carotene or polyphenols.

b) Operational criteria
These criteria could, for example, concern economic aspects for inspection authorities and manufacturers, such as costs associated with the implementation of certain analytical measurements. Accordingly, the choice of the global approach integrating all nutrients should be made on the basis of the cost of obtaining these measurements, which increases with the number of nutrients to take into account.
Other operational criteria could concern conformity inspections by the operator, involving, for example, possible correlation between the nutritional information taken into account when setting NPs and those identified for nutrition labelling. Indeed, the ease with which inspection departments can check access to claims depends on this data tallying, which would in turn ensure consistent nutritional information for nutrition professionals (AFSSA, 2007).

4.3 Reference bases

Several reference bases may be used to calculate NPs:

a) Weight (per 100g or 100mL)
This approach corresponds to current nutrition labelling, but does not take account of the amounts consumed, particularly for liquid foods with a lower nutrient density than solid foods but which are likely to be consumed in greater quantities. Subsequently it does not take into account the food's actual contribution to a nutrient intake.

b) Energy (per 100kcal)
This approach takes greater account of actual consumption levels than the weight-based approach. This is because the nutrient content of a portion is more correlated to the nutrient content in 100kcal than the nutrient content in 100 g (Rayner et al., 2005). For example, on the basis of the American national nutrient database, a positive correlation has been revealed between the quantity of nutrients in 100kcal and in a portion as defined by the FDA (Drewnowski et al., 2008a). That said, some products are consumed in portions whose energy content is significantly different from 100kcal. Applied for disqualifying nutrients, this approach penalises low energy-density foods for which disqualifying nutrient contents appear high on a 100kcal basis. Concerning qualifying nutrients, this approach penalises energy-dense foods for which qualifying nutrient contents appear low on a 100kcal basis.

c) "Per portion"
This approach gives the best reflection of actual consumption levels. Nevertheless, it requires a prior definition of the "portion", the size of which varies depending on product type, individual, eating occasion, dietary cultures and culinary traditions. To date there is no harmonised definition of standard portion sizes, except in the case of certain foods that are systematically consumed in units whose weight or volume varies little (apples, yoghurts, etc.).

d) Combined basis
The FSA (Rayner et al., 2004) studied the possibilities of combining the different reference bases (per 100g and per 100kcal; with the connector "and" or "or"), but without revealing better results than when using a single reference base.

Some schemes do away with the notion of reference basis by using ratios. This is the case for the American scheme, which is based on the criterion "Ratio of recommended to restricted" (Scheidt and Daniel, 2004).

4.4 Nutrient profile calculation method

The calculation of a food's NP must determine if this food is eligible for bearing nutrition claims, nutrition and health claims, or not.
For this, the result obtained for a food is compared to one or more reference values by which it can be determined if the food is eligible to bear a claim, and if so, what type of claim.

The definition of these reference values can be based on the comparative analysis between the intakes observed in the population and the recommended intakes.

4.4.1 Nutritional recommendations: nutrient threshold values and origins

There are two types of nutritional recommendations:

- nutrient intake recommendations, defined for specific age groups and gender; they correspond in France to ANCs (Recommended Dietary Allowances/RDAs) and in Europe to Population Reference Intakes (PRIs). Other references of nutrient intake may be used when calculating NPs, such as Estimated Average Requirements (EARs);
- Food-based dietary guidelines reflect the nutrient intake recommendations and include other parameters (cultural, public health policy objectives, etc.).

The integration of these references in the various profiling schemes will be examined in the paragraph on scoring and thresholds.

4.4.2 Consideration of consumption patterns and dietary habits

Recital 12 of the Regulation on claims states "When setting the nutrient profiles, the different categories of foods and the place and role of these foods in the overall diet should be taken into account and due regard should be given to the various dietary habits and consumption patterns existing in the Member States. Exemptions from the requirement to respect established nutrient profiles may be necessary for certain foods or categories of foods depending on their role and importance in the diet of the population."

Accordingly, the consideration of dietary habits identifies the foods or food groups that are vectors of qualifying nutrients for the population in question. The definition of specific NPs for these foods in a category-based system or across-the-board one with derogatory categories would enable this recital of the Regulation to be taken into account.

Moreover, consumption patterns and dietary habits can provide information backing up certain choices made to define a profiling system:

- in a category-based system, the contribution of different categories of foods to nutritional intakes can be used to select the nutrients to be considered when calculating the NPs;
- this contribution may be used to justify the choices of a different weighting of the same nutrients within different categories.

4.4.3 Scores or thresholds: methods for integrating criteria and establishing the classification

All profiling schemes require the definition of borderlines separating products that are eligible for bearing claims from those that are not.
A distinction is made between schemes based on the definition of thresholds for each nutrient and those based on the definition of an overall score combining all of the nutrients taken into account.

The concept of threshold and its use
For each nutrient considered when calculating NPs, a threshold is defined. For qualifying nutrients, this corresponds to a minimum content and for disqualifying nutrients it corresponds to a maximum content. For a given food, the comparison of its composition with each threshold, and combination of the achieving and/or exceeding of each threshold, determines access to claims.
The different thresholds for each nutrient can be combined by cumulative or exclusive method:

- in a cumulative approach, all of the thresholds set for each nutrient taken into account to define the NP (threshold n and threshold n+1 and threshold n+2 and, etc.) must be reached; this option is exhaustive, which is appropriate when taking account of all disqualifying nutrients. What's more, it does not result in a compensation between qualifying and disqualifying nutrients;
- in an exclusive approach, the composition of a food must comply with a limited number of thresholds (threshold n or threshold n+1 or threshold n+2, etc.). Applied to qualifying nutrients, this approach takes account of the diversity of food nutritional qualities; but for disqualifying nutrients, it may lead, , to some contents in nutrients whose intake must be limited, being concealed.

A more specific method could be considered by setting up an algorithm such as the one described in Afssa's report on omega 3 fatty acids (AFSSA, 2003). For example, the non-compliance of a threshold for a first nutrient may lead to a second one being considered (total fatty acids, then SFAs, then cholesterol). Another possibility could be to vary the thresholds used for disqualifying nutrients depending on the contents of qualifying nutrients.

Thresholds can be derived from intake recommendations expressed on an energy basis. For example, the recommendation aiming for a maximum contribution of 35% of lipids to daily energy intake (or 80g of total lipids for a daily energy intake of 2000kcal) could lead to an upper threshold of 4g of lipids for 100kc of food as consumed.
However, the application of the same threshold for solid and liquid foods with a lower ED is still an issue. Indeed, an appropriate threshold for solid foods may not be suitable for liquid foods.
Furthermore, in a category-based profiling system, threshold adjustments may be operated in certain categories according not just to scientific criteria, for example:

- the consideration of technological and/or nutritional innovations;
- the consistency with regulatory thresholds used in the definition of products or product categories.

Score calculation principle
The calculation of scores used to determine if the composition of a food is in line with the NP, thereby giving access to claims, comprises 3 stages:

1. The allocation of a score to each nutrient that is part of the NP, depending on its content in the food. Several methods for calculating this score can be considered: use of a scale, a continuous function, a ratio between the nutrient content in the food and a reference value.

2. The calculation of an overall score by combining the scores obtained for each nutrient. It is also possible to calculate 2 independent scores, one from qualifying nutrient contents and the other from disqualifying nutrients, which avoids compensation between both types of nutrients.

3. The comparison of overall scores to the reference values to determine if the food is eligible for bearing claims. These reference values can be set on the basis of similar methods to those used for setting thresholds (expert judgements, translation of recommendations or modelling techniques).

Review of methods for calculating nutrient profiles
The previous analyses highlight that threshold-based systems seem easier to apply than scoring systems, although the latter provides more specific information thanks to a quantitative assessment of the food's NP. This is because by calculating the scores, a difference between the product score and required score for accessing claims can be assessed. This tool could also be used as an indicator for assessing the nutritional improvements of products in the context of the assessment of the Regulation's application, foreseen in 2013.

4.5 Testing of profiling schemes

Testing of the profiling schemes proposed comprises two complementary stages: a scientific validation and a practical feasibility test.
Firstly, a scientific validation of the profiling tool is necessary as regards the results obtained with several foods. The method to use for this validation has not been agreed upon to date.
This paragraph reviews some of the existing scientific validation methods being discussed at present.
Secondly, it must be possible for all operators to calculate NPs, which means that all the necessary data must be accessible. Moreover, the definitions of the parameters considered when calculated NPs must be specific enough to avoid any misinterpretation.

4.5.1 Expert judgements

The comparison of the classifications obtained by nutrient profiling schemes with those made by expert panels is one method that has been put forward (Scarborough et al., 2007). The experts individually called on to construct the reference classification were not involved in setting up the assessed profiling scheme. The scheme's performance is measured by the percentage of foods classified in the same way by the experts and the nutrient profiling scheme.
To carry out this classification, each expert uses his/her knowledge on food, existing links between diet, nutrients and health and his/her conceiving of a balanced diet and the public health priorities. Although the classifications according to different experts may appear not to tally, they seem to correlate well within a panel of experts of the same nationality, and more specifically of the same nutritional and dietary culture (Scarborough et al., 2007). Accordingly, the validity of this method is subject to caution, given the numerous cultural factors to be considered (consumption patterns, role of foods in the overall diet, perception and ranking of nutritional risks, etc.). Studies are therefore necessary to assess the feasibility of this technique in the Europe-wide context.

4.5.2 Consumption surveys

Another NP validation method is based on analysing food consumption patterns and the contribution of foods to different types of diet. Quinio's study (Quinio et al., 2006) may be cited to support this approach, organised into two stages:

- the identification of foods positively or negatively associated with "healthy diets" identified in national dietary surveys by comparison to the Eurodiet intake recommendations (EURODIET, 2000). These foods draw up two sets of indicator foods or "gold standards";

- the classification of these indicator foods according to the different nutrient profiling schemes to be tested. The classifications obtained are then compared to the indicator food lists and the relevance of the systems assessed is determined using sensitivity and specificity indicators. This analysis has been conducted using consumption data from 5 countries (Belgium, Denmark, France, Ireland and Italy). The European Eurodiet references (Kafatos and Codrington, 1999) were adopted for defining an optimum diet in compliance with the following nutrient and dietary intake criteria:
    - lipids < 30% of TEI;
    - SFAs < 10 % of TEI;
    - total carbohydrate > 55% of TEI;
    - fruit and vegetable consumption > 400 $g.d^{-1}$;
    - fibre intake > 25 $g.d^{-1}$;
    - salt intake < 6 $g.d^{-1}$;

The results of this study show that this NP validating method could be improved with more accurate lists of indicator (Quinio et al., 2006). Indeed, these lists are sensitive to methodological choices made at various stages, particularly when defining the diet considered as healthy and the method used to compare observed diets with “healthy diets”. Furthermore, since these validation approaches are based on analysing the consumption patterns observed, some foods may be qualified as “favourable” to achieving the nutritional objective solely because they are consumed together with other foods that have a favourable influence on overall nutritional balance. Using these methods, jam, for example, would be identified as a food which helps to achieve overall balance, not because of its own nutritional qualities but because it is generally consumed with bread and/or by people who eat a traditional breakfast, as these dietary habits are associated with better overall dietary balance.

Other validation studies using consumption data have been carried out. In the study by Arambepola et al. (2007), 7,749 foods were classified according to the WXYfm profiling scheme developed by the Food Standards Agency (FSA) (“less healthy” or “healthier”). Moreover, the population of the NDNS survey (National Diet and Nutrition Study) (Henderson et al., 2002) was split into 4 quartiles according to a quality index (Diet Quality Index, DQI) calculated on the basis of total FA, SFA, cholesterol, sodium, protein and calcium intakes, and fruit and vegetable consumption frequency. The results show that foods qualified as “less healthy” by the WXYfm scheme account for a much higher proportion of the energy intake in the group with the lowest DQI. In addition, total energy intake is inversely correlated to the DQI, a correlation explained by the consumption of “less healthy” foods. However, the absolute energy intake of "healthier" foods is identical, whatever the individual DQI.
These results show that a nutrient profiling scheme can be validated on the basis of the contribution of a food to dietary balance or imbalance.

4.5.3 Modelling or simulation techniques

Modelling techniques can avoid the subjective bias of validation methods using expert judgements, or bias associated with dietary habits when methods based on observed consumption patterns are used (see the example of jam in the paragraph above).
Based on linear programming, modelling can be used to design diets with optimum nutritional quality by the use of a food composition table and information on food consumption habits (portions, balance between food groups, etc.). Nutritional, social, cultural or economic criteria can be considered if they can be expressed as numerical constraints on nutrients and foods. Constraints on nutrients ensure the nutritional quality of diets and those on foods guarantee consistent and acceptable food combination. Modelling involves identifying the food combination which best complies with all the constraints (Briend et al., 2003).
This approach could be adapted for validating nutrient profiling schemes. It would, for example, provide information on the impact on consumers of systematically choosing foods bearing claims, particularly in terms of covering needs of nutrients not taken into account when calculating the NPs. A survey conducted in 2004 by the Directorate General for Food (DGAI) and the association Consommation logement et cadre de vie (Consumers, Housing and Living Environment/CLCV) indicates that 50% of French people say that they buy the product bearing the claim when choosing between 2 similar products, one with and the other without a claim (DGAI/CLCV, 2004). This tendency seems to be confirmed by the preliminary results of the INCA 2 survey.

A second type of modelling by linear programming involves the construction of an optimum diet in compliance with a set of pre-defined nutritional recommendations (based on Eurodiet or on ANCs),

while sticking as closely as possible to the dietary habits observed (Maillot et al., 2007b). This optimum diet is then compared to the diets observed in an individual consumer survey. By analysing the modifications operated by the modelling to “correct” each observed diet so as to optimise its nutritional quality, “balancing”, “neutral” and “unbalancing” foods can be identified depending on whether their consumption must be increased or reduced to correct the diet observed.

4.5.4 Analytical epidemiological studies

A validation of nutrient profiling schemes using NP correlations with health data obtained from epidemiological studies could be considered. At present, these methods have been used to define overall diet quality indexes and their correlation with health (Kant, 2004).
Of the overall diet quality indexes, the RFS (Recommended Food Score) counts the number of consumed foods qualified as “recommended for health”. This index is inversely correlated to death rates (Kant et al., 2000) and positively correlated to other diet quality indexes and health indicators (Kant and Graubard, 2005). These results suggest that nutrient profiling schemes could be validated by epidemiological approaches.

4.5.5 Overall assessment of methods for testing nutrient profiling schemes

Lastly, nutrient profiling methods based on expert judgements are subjective, irrespective of the number and diversity in nutritional and dietary culture of the experts called on. Methods based on modelling of intakes and nutritional status are currently considered but need to be developed, particularly in terms of health markers used to select indicator foods, the consumption of which positively or negatively contributes to preventing chronic diseases.
Studies based on French nutrition survey data show that it has been possible to significantly characterise ($p=0.01$) a maximum of 33% of foods tested as indicators, favourable or unfavourable in achieving the nutritional recommendations (Quinio et al., 2006, Volatier et al., 2007). Indeed, validation methods based on observed consumption patterns only characterise the foods for which the link between their consumption and the overall diet nutritional quality is significant (or state of health, if the work is conducted in this regard), but do not classify foods whose consumption is not significantly correlated to these criteria. However, validation methods based on expert judgements provide opinions for all foods.
Accordingly, the results of different validation techniques (expert judgement and modelling techniques) could be compared to identify a common denominator, which could be a list of indicator foods, considered by all methods to positively or negatively contribute to nutritional balance.

5 WORKING GROUP'S ORIGINAL STUDIES ON FOOD CATEGORISATION

Afssa has developed methods to categorise foods on the basis of their nutritional characteristics. The method chosen by Afssa is principal component analysis (PCA) followed by Hierarchical Ascending Classification (HAC).

5.1 Principle of PCA-HAC

5.1.1 PCA

PCA is used to describe a population – foods – on the basis of descriptive variables – their nutrient contents. This technique makes it possible to reduce a set of observed variables into a smaller set of artificial variables called principal components.
Each principal component represents a linear combination of the observed variables and defines an axis accounting for a maximum amount of total variance in the observed variables. The axes carrying the greatest inertia (information) are used to construct a factorial plane onto which each food is projected. These axes are characterised by calculation of correlations between the axes and the variables. Each food can then be nutritionally characterised on the basis of its position on the factorial plane.

5.1.2 HAC

Then, HAC groups together by repetitions foods that are close in nutritional terms. The distance between 2 foods is calculated by their factor scores. The process begins with n foods, then n-1 foods (when 2 foods are grouped together), then n-2 until groups presenting a high between-class variability and a low within-class variability are obtained. The process is stopped when the within-class variability increases too much with an additional grouping.
Once the food groups have been defined in this way, a new food can be allocated to one of these groups on the basis of its factor scores.

5.1.3 Data used

Afssa applied this method to 620 foods consumed by the subjects of the INCA 1 survey (Individual and national enquiry on food consumption), excluding alcoholic beverages and calorie-free foods. The Ciqual nutritional composition table (Favier et al., 1995) was used and completed by the Suvimax table for essential FAs (Collectif, 2006), by international tables for trace elements (Lamand et al., 1996) and other specific tables (AFSSA, 2005). In total, 35 nutrient contents were used in the studies reported hereafter. The food composition database used in these studies is presented in annex 2.

5.2 Feasibility of food categorisation using the PCA-HAC principle

Application of PCA-HAC to 620 foods leads to 9 food groups (Annex 3).
Groups 1 to 3 each contain a large number of foods and appear to be heterogeneous in terms of nutrient composition. It nonetheless appears that these groupings are influenced by the energy density (ED) and the nutrient density (ND):

- group 1 (n=244) contains products with a low ED (median ED=62 kcal/100 g); these are plant-derived products (fruit, vegetables, pulses, cereals), soft drinks, some fresh dairy products;
- group 2 (n=160) contains products with a high ND and an intermediate ED (median ED = 192 kcal/100 g); these are animal-derived products;
- group 3 (n=123) contains products with a high ED (median ED = 294 kcal/100 g) and/or low ND; these are products with a high sugar and/or fat content.

Group 4 includes foods for which the common characteristic is their high iodine and zinc content, in this example the majority of cheeses and oysters.

Groups 5 to 9 contain fewer foods than the first 4 groups and appear to be more homogeneous in nutritional terms:

- group 5 includes all fats;
- group 6 contains oily fish;
- group 7 contains fortified cereals;
- group 8 contains nuts;
- group 9 contains liver.

Applied to food categorisation, this method therefore proves to be effective for differentiating certain products, such as oily fish, fats or fortified products.
Of the 9 groups obtained, several are very heterogeneous in nutritional terms. This result suggests that the use of a high number of nutrients (35) does not lead to precise differentiation of foods. These heterogeneous groups nonetheless present common ND and ED characteristics, demonstrating the importance of these two variables for the categorisation of foods.

These results confirm the complexity of obtaining food categories defined on the basis of their nutritional characteristics, despite the use of powerful statistical tools.
Other methods, such as Hierarchical Descending Classification, could be considered. In the event of conclusive results, this method could also be applied to calculation of nutrient profiles (NPs) within the categories so defined. The profiles could then be defined on the basis of nutrient content thresholds that discriminate the different classes obtained.

Non-conclusive results in terms of food categorisation led Afssa to propose an across-the-board nutrient profiling scheme. These studies are detailed in the next chapter.

6 ORIGINAL STUDIES AND AFSSA PROPOSAL: A TWO-SCORE, ACROSS-THE-BOARD SCHEME, ($SAIN_{5OPT}$, LIM_3)

Following the reflection processes outlined in the previous chapters, Afssa carried out studies leading to the proposal of an original across-the-board nutrient profiling scheme. This scheme was constructed on the basis of pre-existing tools: the SAIN score (nutrient density score) and the LIM score (limited nutrient score). These scores were initially developed to analyse the relationship between nutritional quality and the cost of the food, and the first studies using them reveal a positive correlation between the cost of the food and its nutrient density (Maillot et al., 2007a, Darmon et al., 2005).
In addition, studies have been performed with the (SAIN, LIM) applied to previously defined food categories (Maillot et al., 2007a) on the basis of the consumptions of individuals in the INCA 1 survey:

- the "fruit and vegetables" category showed a high SAIN and a low LIM;
- the "meat/eggs/fish" category showed a high SAIN and a moderate LIM;
- the "added fats" category and products such as desserts and snacks showed a low SAIN and a high LIM;
- "dairy products" and "ready meals" had intermediate SAIN and LIM scores.

These studies also show that a high SAIN is generally correlated with a low LIM, with the exception of starchy foods, in particular unrefined, which show a low LIM and a high SAIN.
Applied to food groups, the SAIN and LIM indicators are therefore globally consistent with the experts' opinions with respect to the comparative nutritional quality of food categories. The working group therefore initiated studies designed to test whether this scheme, or a scheme derived from this one, would also be effective for describing the nutritional quality of foods considered individually.

Afssa adapted and tested this scheme for use as a nutrient profiling scheme in the context of application of the European regulations concerning claims.

6.1 Principle of the (SAIN, LIM) system

For a given food, the SAIN score is the mean of percentages of dietary reference intakes for several qualifying nutrients. Several formulas for the calculation of this score were tested, taking into account a defined number of nutrients and using recommended dietary intakes (ANCs) or estimated average requirements (EARs) as nutritional references. Several reference bases were also tested: nutrient contents per 100g or per 100kcal (Darmon et al., 2005). In the context of the claims regulation, the energy basis (per 100kcal) was chosen to express the SAIN.

The LIM (disqualifying nutrients per 100g of food) is the mean of percentages of maximum recommended intakes for a defined number of disqualifying nutrients. This indicator is calculated per 100g of food, and not per 100kcal, in order not to penalise foods with a low ED, such as fruit and vegetables.

The choice of a combined calculation basis (per100 kcal for the SAIN and per 100g for the LIM) is in line with current recommendations to promote foods with a low ED and a high ND. The SAIN measures the ND (qualifying nutrients as the denominator and energy as the numerator) and the LIM is an indicator that is closely correlated (positively) with the ED of the food since it incorporates energy-rich nutrients. However, the LIM is a more precise measurement than straightforward measurement of energy value. In particular, among macronutrients, it only counts those for which a maximum intake is considered to be detrimental to health (disqualifying nutrients).

6.1.1 Formulas

The SAIN and LIM calculation formulas are linear equations that involve no threshold and no weighting. Thus, all the nutrient contents used in the SAIN and LIM formulas are allocated a coefficient of 1 by default.

SAIN formula
The generic SAIN formula is as follows:

$$\mathbf{SAIN} = \frac{\left(\frac{Nut_1}{Reco_1} + \frac{Nut_2}{Reco_2} \ldots + \frac{Nut_n}{Reco_n}\right)}{n} \times 100 \Big/ ED \times 100$$

where:

- n = number of qualifying nutrients;
- ED = energy density of the food in kcal/100g;
- Nut_i = amount of nutrient i in 100g of food;
- $Reco_i$ = recommended daily intake for the nutrient i expressed in the same unit as Nuti.

This score corresponds to a mean percentage of consistency with the recommendations. It is the mean of n R_i ratios, each corresponding to a percentage of the recommended intakes for the nutrient i present in 100kcal of food:

$$SAIN = \frac{\sum_{i=1}^{n} R_i}{n}$$

where:

$$R_i = \frac{Nut_i \times 100}{Reco_i \times ED} \times 100$$

LIM formula
The generic LIM formula is as follows:

$$LIM = \frac{\left(\frac{Dis_1}{Max_1} + \frac{Dis_2}{Max_2} + \ldots + \frac{Dis_n}{Max_n}\right)}{n} \times 100$$

where:

- n = number of disqualifying nutrients;
- Dis_i = amount of disqualifying nutrients i in 100 g of food;
- Max_i = maximum daily recommended intake for the nutrient i, expressed in the same unit as Max_i

The LIM is calculated per 100g of food, ready to consume. Hence, for dry or dehydrated foods, the LIM is calculated per 100g of food cooked and/or rehydrated. Likewise, for foods with waste (bones, stones, inedible skin, etc.), the LIM is calculated per 100g of product, after deduction of the waste weight.

The LIM is the mean of the percentages D_i by which a food exceeds the nutritional recommendations for each of the nutrients taken into account, in 100g of food:

$$LIM = \frac{\sum_{i=1}^{n} D_i}{n}$$

where

$$D_i = \frac{Dis_i}{Max_i} \times 100$$

6.1.2 Graphic representation

A method of visually plotting the SAIN and LIM on the same plane was developed, with the LIM on the x axis and the SAIN on the y axis, in order to position foods on the basis of their qualifying and disqualifying nutrient content.
A logarithmic scale was chosen both for the LIM and the SAIN, given the relatively high values that these indicators may reach, especially the SAIN.
This graph divides the foods into 4 quadrants, demarcated by the SAIN and LIM reference points, defined in paragraph 6.3.1:

- the high SAIN and low LIM quadrant, or “quadrant 1”;

- the low SAIN and low LIM quadrant, or “quadrant 2”;
- the high SAIN and high LIM quadrant, or “quadrant 3”;
- the low SAIN and high LIM quadrant, or “quadrant 4”.

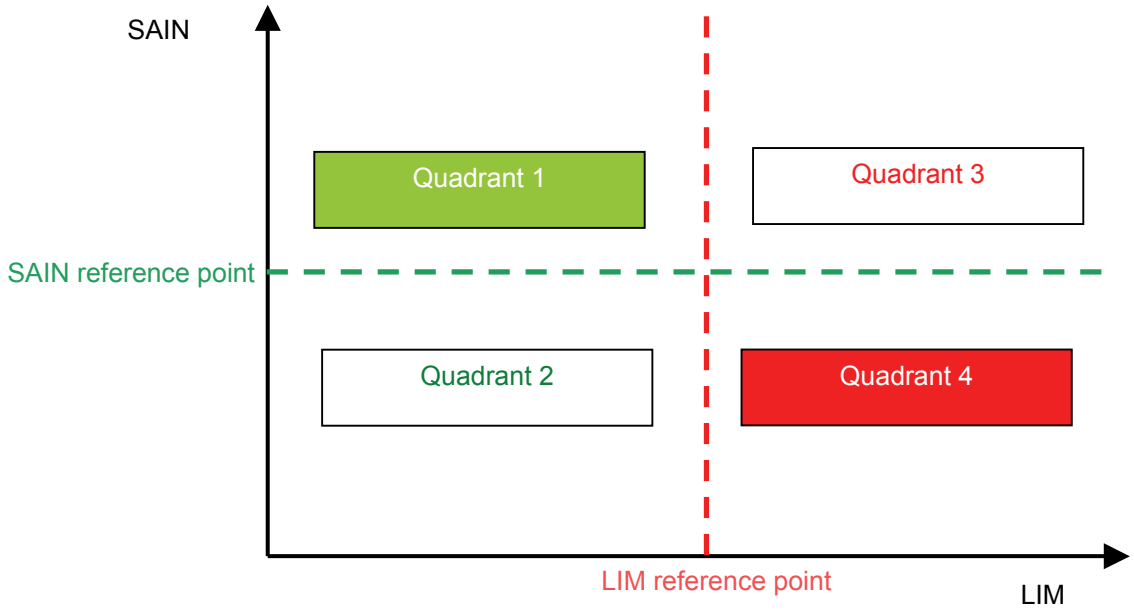

Figure 1: Graphic representation of SAIN and LIM scores

6.2 Use of (SAIN, LIM) for access to claims

6.2.1 Choice of nutrients

The choice of nutrients which contents are taken into account in calculation of the SAIN and the LIM is based on the notion of balanced diet. A balanced diet results from a selection of varied and complementary foods, covering nutritional requirements, without the intake of certain nutrients excessively exceeding the recommendations.
The choice of the number of nutrients in each of the SAIN and LIM formulas is closely linked to their type. Indeed, a compromise has to be found between a relevant choice in terms of public health and a pragmatic choice, taking into account the feasibility of calculation of NPs by operators (manufacturers and control authorities).

6.2.2 Choice of disqualifying nutrients

The regulation relative to claims recalls that “the establishment of nutrient profiles should take into account the content of different nutrients and substances with a nutritional or physiological effect, in particular those such as fat, saturated fat, trans-fatty acids, salt/sodium and sugars, excessive intakes of which in the overall diet are not recommended, as well as poly- and mono-unsaturated fats, available carbohydrates other than sugars, vitamins, minerals, protein and fibre”.

Afssa notes that fats are included in this statement three times (total fat, saturated fat and trans-fatty acids), which is not consistent with the method proposed, as each factor is allocated a coefficient of 1.

Four LIM formulas (see annex 4b) were tested.

The LIM 3 includes sodium, saturated fat and added sugar (AS) contents, and LIM 3_{TS} uses sodium, saturated fat and total sugar (TS) contents.

In order to take into consideration the specific features of liquid foods (beverages and other), often dealt with separately in other existing profiling schemes, the calculation of a LIM specific to these products can be proposed. This could involve, for example, applying the LIM 3 formula and multiplying

the results by a factor taking into account the quantities actually consumed (2.5 if we consider that the average liquid portion is 250mL). However, the use of this system requires prior definition of foods for which this calculation rule applies.

To determine the type of sugar to be taken into account – total or added – tests were performed with each of the 2 nutrients. When TS is taken into account, numerous foods (dried or fresh fruit and dairy products), the consumption of which is encouraged by nutritional recommendations, do not present the NP required to bear claims.
Afssa chose a calculation based on AS, the results of which are more consistent with nutritional recommendations. This choice is also justified by the existence of a reference in terms of maximum daily intakes for AS, for which a scientific consensus exists (WHO, 2003), such a reference value not currently existing for TS.
Due to the difficulty of obtaining reliable analytical data concerning the AS content of foods, verifications of compliance with the NP required to bear claims could be based on data provided by manufacturers or on estimates made on the basis of recipes.

6.2.3 Choice of qualifying nutrients

The choice of the number of qualifying nutrients and their nature must be appropriate to the objective pursued, while at the same time incorporating practical parameters related to the obtaining and control of the required data. Hence, the number and nature of the nutrients to be taken into account are inter-dependent. It is necessary to find a group of nutrients representative of the nutritional value of the majority of foods in terms of public health, at the same time incorporating practical considerations, such as an overlap between nutrition labelling information and that used for the calculation of the NP, or the accessibility of data and their verification.

To determine the number of nutrients, Afssa worked on the basis of a comparison of the results obtained with various SAIN formulas. The relevance of one model in comparison with another was assessed thanks to misclassifications identified. A misclassification represents an inconsistency between the classification obtained and the recommendations based on food groups (such as food guides and PNNS (National Programme for Nutrition and Health) reference intakes).

Formulas tested
The SAIN 23 initially proposed (Maillot et al., 2007a) took into account all the qualifying nutrients present in the food composition database and for which an ANC exists (table 1).
For feasibility reasons, both for the administrator and economic operators, it would not be possible to require this level of information, in particular due to the analytical difficulty of some measures and the costs involved in obtaining some of these data. The results obtained with the SAIN 23 were therefore compared with 10 other SAIN formulas incorporating a smaller number of nutrients, judged to be relevant in terms of public health.
Thus, 11 SAIN formulas, using 5, 6, 16 or 23 nutrients were tested for classification of foods in the INCA 1 database. Of these 11 formulas, 6 also took into account optional nutrients (see formulas in annex 4a).

Table 1 : Nutrients in SAIN 5, SAIN 16 and SAIN 23 and corresponding RDIs

				Nutrient	RDI
SAIN 5	SAIN 6	SAIN 16	SAIN 23	Protein	65 g
				Fibre	25 g
				Vitamin C	110 mg
				Calcium	900 mg
				Iron	12.5 mg
				Vitamin D	5 µg
				Alpha-linolenic acid	1.8 g
				Magnesium	390 mg
				Potassium	3,100 mg
				Zinc	11 mg
				Vitamin E	12 mg
				Thiamine (B_1)	1.2 mg
				Riboflavin (B_2)	1.6 mg
				Vitamin B_6	1.7 mg
				Folates (B_9)	315 µg
				DHA	0.11 g
				Vitamin A	700 µg
				Vitamin B_3	13 mg
				Linoleic acid	9 g
				Vitamin B_{12}	2,4 µg
				Copper	1.8 mg
				Iodine	150 µg
				Selenium	55 µg

Comparison of results obtained with SAIN 5, SAIN 6, SAIN 16 and SAIN 23

- the classifications obtained with SAIN 23 and SAIN 16 are identical for the majority of foods;
- the use of SAIN 16 in comparison with SAIN 6 makes it possible to correct a number of the misclassifications with SAIN 6 (concerning fruit with a high sugar content and oils with a high PUFA content) but also induces new ones (concerning meat products and fried products);
- SAIN 6 takes into account the nutritional quality of oily fish more accurately, thanks to the use of vitamin D;
- SAIN 5 corrects the misclassifications observed with SAIN 6, particularly for fruit.

These observations reveal that, irrespective of the number of nutrients used, misclassifications are observed.
Hence, Afssa chose the five-nutrient group, which best responds to the feasibility constraints of the scheme, and which is just as relevant as the choice of an SAIN with a higher number of nutrients.

Development of the optional nutrient system

In order to fine-tune the results obtained with SAIN 5, Afssa chose to develop an “optional” SAIN 5 (SAIN 5_{opt}), calculated on the basis of the five nutrients of SAIN 5, which can be substituted by one or more optional nutrients selected from a predefined list. The optional nutrient is the nutrient for which the ANC cover percentage is the highest. This nutrient is substituted in the SAIN 5 for the one for which the percentage of covering of the ANC is the lowest. Hence, the value of SAIN 5_{opt} is always at least equal to the SAIN 5 value.
This approach has the effect of correcting certain misclassification, with a view to obtaining a more representative, more discriminatory and more relevant system.

The results obtained with 6 SAIN 5_{opt} formulas were compared with the results obtained with SAIN 5.

The SAIN 5_{opt11} (selection of one of 11 optional nutrients) corrects certain misclassifications identified with SAIN 5, especially concerning oily fish, nuts and vegetable oils (rapeseed, walnut and sunflower). However, this formula introduces new misclassifications, particularly concerning certain fatty products (pork products, fatty meats, mayonnaise, salted nuts, fried foods).
Afssa therefore judged that this formula, which is more complex to implement, did not increase the relevance of SAIN 5.

The SAIN 5_{opt3} (selection of one of three optional nutrients, ALA, vitamin E and vitamin D) does not correct the misclassifications for oils and nuts. This formula, which is more complex to use, is therefore no more relevant than the SAIN 5 formula.
The SAIN 5_{opt2} (selection of one of two optional nutrients, vitamin E and vitamin D) corrects the misclassifications for oily fish but also values any fatty products with a high vitamin E content, such as fried foods, mayonnaise and salted nuts. Among oils, only sunflower oil, which has a higher vitamin E content, is valued. The choice of vitamin E as an optional nutrient for all foods is not appropriate therefore.
The results obtained with SAIN 5_{opt} (one optional nutrient for all foods, vitamin D) are identical to those with SAIN 5, with the exception of oily fish, which SAIN 5_{opt} is higher than 5 thanks to the introduction of vitamin D into the model.

A different profile for fats was also tested and applied to all foods providing more than 97% of their energy in the form of fat. For these foods, two SAIN formulas were tested: the SAIN $5_{optD\text{-}Lip97}$ and the SAIN $5_{optD\text{-}2Lip97}$.
Both these formulas take into account vitamin D as an optional nutrient for foods containing less than 97% fat. For foods containing more than 97% fat, one optional nutrient is selected from among vitamin D, vitamin E and ALA for SAIN $5_{optD\text{-}Lip97}$; two optional nutrients are selected from among vitamin D, vitamin E, ALA and MUFA for SAIN $5_{optD\text{-}2Lip97}$.

The only difference between these two formulas concerns the classification of oils. The SAIN $_{5opD\text{-}Lip97}$ for rapeseed, walnut and sunflower oils is higher than 5, in contrast with that for olive oil and peanut oil. The SAIN $5_{optD\text{-}2Lip97}$ is the only formula with which all the oils have a score of above 5. However, the use of this formula is more complex than that of other optional SAIN formulas, since the nature and number of optional nutrients varies depending on the percentage of fats contained in the food.

Final SAIN formula proposed by Afssa
The SAIN formula used by Afssa in the context of the example presented in this report, the SAIN 5_{opt}, takes into account the contents of 5 nutrients, iron, vitamin C, calcium, fibre and protein, and one optional nutrient, vitamin D (Chapter 6.5).

The nutrients to be taken into account in calculation of the SAIN are relevant in terms of public health and represent markers of the food groups that are subject to nutritional recommendations promoting their consumption.

Iron, calcium and vitamin C are nutrients for which groups at risk of inadequate intakes exist in France (women between the ages of 20 and 35 for vitamin C, adolescents and adults over the age of 65 for calcium, women between the ages of 15 and 54 for iron (AFSSA, 2004)). The average daily intakes of fibre among non-underreporting adults in the INCA survey are below the recommendations (17.6g versus 20 to 30g recommended).
In addition, these 5 nutrients represent other nutrients that were not taken into account in calculation of the SAIN, for reasons of feasibility and system reality. For example, the presence of proteins in foods is correlated with that of other essential nutrients, such as vitamins B_2, B_3, B_5, B_{12}, iodine, selenium or zinc.
Iron is a marker of meats, calcium is a marker of dairy products, fibre and vitamin C are markers of unrefined fruit and vegetables. The simultaneous use of these five nutrients therefore makes it possible to take into account, when calculating the NP, the principle of the diversity of foods required for a balanced diet.
One optional nutrient can be substituted for one of the five nutrients in this formula.
In the example detailed hereafter, Afssa opted to use vitamin D in order to correct the misclassifications for oily fish.

Relevance of choices made for the number and type of nutrients included in the SAIN 5opt
Afssa double-checked the relevance of the choices made in the SAIN 5opt formula, with one check based on the random generation of SAIN formulas, and the other on calculation of correlations.

Random generation of SAIN formulas

For each SAIN (SAIN 5, SAIN 7, SAIN 9, SAIN 11, SAIN 13), 10,000 different formulas were generated by randomly selecting the nutrients included in each formula from a list of 23. Each formula was then applied to 613 foods in the INCA 1 database. Non-parametric correlations (Spearman) were calculated between each score and the contents of each of the 23 nutrients in the table (expressed as % of RDI per100 kcal).

Of the 23 nutrients used in these studies, the contents of 12 nutrients (protein, calcium, iron, zinc, potassium, magnesium, copper, vitamins B1, B2, B3, B6 and B9) were correlated (r>0.5) with the scores obtained with SAIN 5opt. For each series of 10,000 SAIN formulas randomly generated, the number of correlated formulas (r>0.5) with at least 12 nutrients was calculated.

Table 2: Number (mean, standard deviation and median) of strong correlations (r>0.5) between the scores obtained with the randomly generated SAINs and the contents of 23 nutrients (expressed as % of RDI/100kcal) for each series of 10,000 random SAIN formulas

Number of nutrients in random SAINs	Mean number of strong correlations (out of 23)	Median number of strong correlations (out of 23)	Probability of having more than 12 strong correlations (out of 23)
5	7.45 (3.52)	9	26 out of 10,000
7	7.63 (3.50)	9	29 out of 10,000
9	7.77 (3.22)	9	41 out of 10,000
11	7.80 (2.78)	8	26 out of 10,000
13	8.10 (2.30)	8	10 out of 10,000

The number (mean or median) of strong correlations observed with each of the 23 nutrients is little affected by the number of nutrients included in the SAIN calculation. Irrespective of the number of nutrients introduced, each SAIN is correlated with 7, 8 or 9 different nutrients. However, the probability of being strongly correlated with more than 12 different nutrients is low, irrespective of the number of nutrients included in the SAIN. Furthermore, this probability was the lowest (10 per 10,000) with the SAIN 13 series.

These results show that there is no advantage, for representing all the nutrients, of including more nutrients in the SAIN calculation. It is the type of nutrients that determine the relevance of the formula.

Calculation of correlations

Table 3: Correlations between the six nutrients composing the SAIN 5opt (protein, fibre, calcium, iron, vit C and D) and 18 other nutrients (vit E, A, MUFA, ALA, DHA, vit B1, B2, B3, B5, B6, B9, B12, iodine, potassium, magnesium, copper, zinc and selenium) (expressed in % RDI / 100 kcal, after log transformation of the variables)

		SAIN 5_{opt} components					
		hydrophilic nutrients					nutrients associated with fats
		Protein	Fibre	Vit C	Ca	Fe	Vit D
hydrophilic nutrients	Vit B1	0.45	0.49	0.54	0.24	0.54	-0.13
	Vit B2	0.64	0.10	0.34	0.50	0.49	0.09
	Vit B3	0.63	0.25	0.34	-0.08	0.58	0.03
	Vit B5	0.53	0.29	0.49	0.33	0.51	0.08
	Vit B6	0.46	0.44	0.59	0.25	0.60	-0.05
	Vit B9	0.19	0.69	0.72	0.47	0.58	-0.09
	Vit B12	0.58	-0.45	-0.20	-0.07	0.21	0.42
	K	0.40	0.61	0.71	0.44	0.68	-0.19
	Mg	0.46	0.59	0.57	0.54	0.70	-0.20
	I	0.53	-0.29	-0.12	0.42	0.02	0.38
	Cu	0.27	0.57	0.50	0.18	0.73	-0.13
	Se	0.70	-0.23	-0.10	0.04	0.31	0.34
	Zn	0.73	0.10	0.16	0.40	0.54	0.02
nutrients associated with fats	DHA	0.46	-0.39	-0.24	-0.22	0.06	0.61
	ALA	0.09	0.13	0.16	0.15	0.14	0.09
	Vit E	0.02	0.30	0.33	0.04	0.20	0.06
	Vit A	0.05	0.27	0.40	0.41	0.23	0.23
	MUFA	0.03	-0.50	-0.50	-0.27	-0.31	0.30

Table 3 shows that the SAIN 5_{opt}, although based on a limited number of nutrients, is correlated with the majority of nutrients not taken into account in its formula. With the exception of four nutrients associated with fats (vitamin E, vitamin A, ALA, MUFA), all the nutrients not included in the SAIN 5_{opt} formula are correlated (R^2>0.5) with at least one nutrient in the SAIN 5_{opt}. Vitamin D is very strongly correlated with DHA, its inclusion in the calculation of the SAIN 5_{opt} therefore makes it possible to indirectly take into account this essential fatty acid. These results suggest that the nutrients in the SAIN 5_{opt} can be considered as markers of nutrients not taken into account in its calculation. The score obtained with this formula therefore provides a relevant and complete representation of the nutrient density of numerous foods.

However, these correlations demonstrate that the SAIN 5_{opt} does not reflect the vitamin E, vitamin A, ALA and MUFA contents of foods. This implies that a different approach must be envisaged for fats and foods rich in fats, such as nuts. Hence the incorporation of another optional parameter (ALA, vitamin E, w6/w3) could make it possible to better evaluate the nutritional characteristics of products containing fat-soluble vitamins and essential fatty acids.

6.3 Calculations

Regulation (EC) No 1925/2006[5] authorises the addition of vitamins and minerals in ordinary foods.
Paragraph 5 of article 6 of this regulation indicates: "When the maximum amounts referred to in paragraph 1 and the conditions referred to in paragraph 2[6] are set for vitamins and minerals whose reference intakes for the population are close to the upper safe levels, the following shall also be taken into account, as necessary […] the nutrient profile of the product established as provided for by Regulation (EC) No 1924/2006". Furthermore, the use of claims is a means of highlighting the addition of nutrients.
However, the addition of vitamins and minerals to foods should be considered, above all, as a means of correcting inadequate nutrient intakes, observed in certain populations or certain groups of the population, and not, strictly speaking, as a means of improving the nutritional quality of the products for the purposes of access to nutrition and health claims.
Afssa therefore considers that NPs should be calculated prior to any addition of vitamins or minerals.

The composition database of foods used for SAIN and LIM calculations is presented in annex 2.

6.3.1 Reference values and marker values

Afssa opted to use French reference values (ANC or recommended dietary intakes/RDIs), since these values can be adapted if the system is used on an international scale. The values used in this report as dietary reference intakes are as follows:

- protein: 65g;
- fibre: 25g;
- vitamin C: 110mg;
- calcium: 900mg;
- iron:12.5mg;
- vitamin D: 5µg.

The values correspond to the mean ANC values for adult men and women.

The SAIN and LIM scores calculated for a given food are then compared with reference points in order to identify scores allowing, or otherwise, access to claims.
The SAIN is calculated per 100kcal and the LIM per 100g, whereas the recommendations are formulated in terms of daily intake. The calculation of reference points for SAIN and LIM therefore requires the definition of daily energy and food weight intake references. The values chosen depend on the target population and objective.

For the SAIN (minimum value to be reached, corresponding to an average cover of 100% of RDIs for all the nutrients taken into account), a reference daily energy intake of 2000kcal was chosen. This energy intake corresponds to the reference accepted in the context of European discussions on nutrition labelling.
Related to 100kcal in the SAIN 5_{opt} calculation, this reference point is 5% (100/2000).

For the LIM (upper limit not to be exceeded, corresponding to reaching of the maximum recommended intakes for the nutrients taken into account), a daily food intake of 1,340g was considered. This value corresponds to the mean daily intake (excluding calorie-free drinks and alcoholic beverages) observed in the French adult population in the INCA 1 survey (Volatier, 2000). It is the product of the sums of mean daily quantities of food consumed by a non-underreporting adult in the survey.
Related to 100g in the LIM 3 calculation, this reference point is 7.5% (100/1340).

6.3.2 SAIN 5opt formula

The SAIN 5_{opt} estimates the mean of percentages of recommended dietary intakes for 5 qualifying nutrients in 100kcal of the food concerned:

[5] REGULATION (EC) No 1925/2006 of the European parliament and of the Council of 20 December 2006 on the addition of vitamins and minerals and of certain other substances to foods
[6] "Any conditions restricting or prohibiting the addition of a specific vitamin or mineral to a food or a category of foods shall be adopted in accordance with the procedure referred to in Article 14(2)."

$$\text{SAIN } 5_{opt} = \frac{\left(\frac{\text{Protein}}{65} + \frac{\text{Fibre}}{30} + \frac{\text{Ca}}{900} + \frac{\text{Fe}}{12,5} + \frac{\text{vit C}}{110} + \frac{\text{vit D}}{5}\right) - \text{min}}{5} \times 100}{\text{ED}} \times 100$$

Where:

- ED = energy density in kcal/edible 100g
- Protein = protein content in g/100g (ANC = 65g/d);
- Fibre = fibre content in g/100 g (ANC = 25g/d);
- Vit C = vitamin C content in mg/100 g (ANC = 110mg /d);
- Ca = calcium content in mg/100 g (ANC = 900mg/d);
- Fe = iron content in mg/100 g (ANC = 12.5mg/d).
- Vit D = vitamin D content in µg/100 g (ANC = 5µg)
- min = the lowest of the 6 [content/ANC] ratios

The optional nutrient (in this case, vitamin D) is only used in the formula if it allows a higher score. Calculation of the SAIN 5_{opt} always takes into account 5 nutrients, therefore, but the nutrients used vary depending on the foods.

6.3.3 LIM 3 formula

The LIM 3 estimates the mean of percentages of maximum recommended intakes for 3 disqualifying nutrients (Na, SFA, added sugar) in 100g of food consumed:

$$\text{LIM 3} = \frac{\left(\frac{\text{Na}}{3153} + \frac{\text{SFA}}{22} + \frac{\text{added S}}{50}\right)}{3} \times 100$$

- Na = sodium content in mg/100g (3,153mg Na corresponds to 8g of salt);
- SFA = SFA content in g/100g (22g of SFA corresponds to 10% of an average daily intake of 2000kcal);
- added S = added sugar content in g/100g (50g of AS corresponds to 10% of an average daily energy intake of 2000kcal).

The LIM 3 formula is identical for all foods.
The European regulation on claims provides for a derogation from general application of NPs, authorising the use of nutrition claims “where a single nutrient exceeds the nutrient profile provided that a statement about the specific nutrient appears in close proximity to, on the same side and with the same prominence as the claim”. In order to comply with this regulatory provision, a LIM 2 can be calculated. This involves applying the LIM formula excluding the most disqualifying nutrient for a given food. The most disqualifying nutrient is the one with the highest percentage of exceeding the maximum recommended intake.

6.4 Conditions for access to claims

Afssa recalls that the assessment of claims is based on: (AFSSA, 2008):

1. scientific substantiation of the claim by data establishing a link between the nutrient and the claimed effect;
2. the relevance of the claim in terms of public health in view of the nutrient intakes observed in the population and their consistency with current nutritional recommendations.

6.4.1 Health claims

For access to health claims, the various types of claim (health claims other than those referring to the reduction of disease risk, health claim referring to the reduction of disease risk, claims referring to children's development and health), were not considered separately. In other words, the notion of a different level of evidence required for validation of these types of claims was not considered (AFSSA, 2008).

Afssa proposes that only foods presenting the highest SAIN combined with the lowest LIM should have access to health claims, in order to ensure consistency with the criteria set for assessment of claims.

Hence, only the foods present in quadrant 1 have access to health claims.

A European study aimed at assessing the positive or negative contribution of foods to compliance with Eurodiet nutritional criteria (Volatier et al., 2007) demonstrated that it was not possible to reach a conclusion for the majority of the foods tested. This demonstration is in line with Afssa's proposal not to consider foods present in intermediate quadrants 2 and 3, in the absence of scientific arguments.

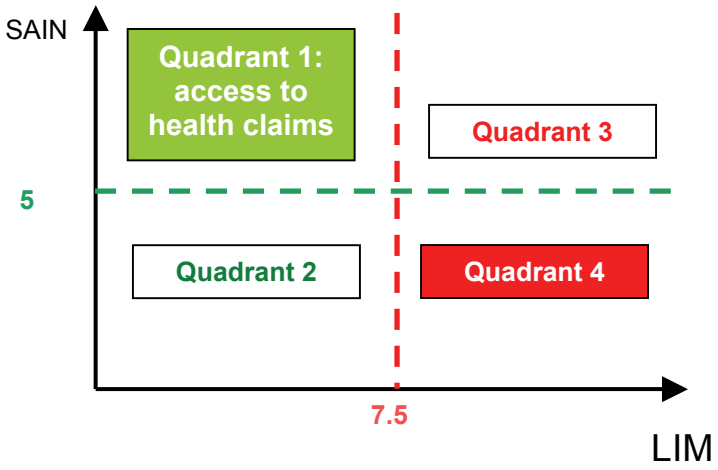

Figure 2: Conditions for access to health claims

6.4.2 Nutrition claims

Foods with a high LIM (quadrants 3 and 4) have, by definition, high contents of one or more disqualifying nutrients. Afssa considers that the use of nutrition claims could hide the characteristics of these foods. The regulation indicates that "foods promoted with claims may be perceived by consumers as having a nutritional, physiological or other health advantage over similar or other products […]".

Afssa therefore proposes that only foods present in quadrants 1 and 2 should have access to nutrition claims.

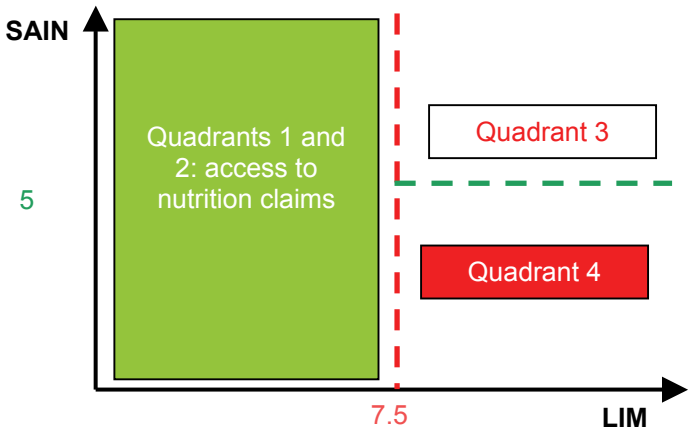

Figure 3: Conditions for access to nutrition claims

Foods having access to health claims would also systematically have access to nutrition claims. This proposal is consistent with the regulation on claims, which indicates that foods bearing health claims must contain significant amounts of the nutrients in question, this significant content being defined by the thresholds for "source of" and "high in" nutrition claims

6.4.3 Nutrition claims with derogation

The SAIN value for certain foods in quadrant 3 suggests a possible nutritional benefit that it would be appropriate to communicate to consumers with nutrition claims. Similarly, some foods in quadrant 4 can present a nutritional benefit related to their content in a nutrient that was not taken into account in calculation of the SAIN 5_{opt}.
Afssa therefore proposes that these foods benefit from the possibility of a derogation in order to have access to nutrition claims.
The implementation of a derogation consists of calculation of a LIM 2, after removal of the most disqualifying nutrient, and not a LIM 3 (Paragraph 6.3.3).

Afssa considers that foods in quadrants 3 and 4 with a LIM 3 higher than 7.5, but with a LIM 2 below 7.5 may benefit from the derogation provided for by the regulations and have access to nutrition claims.
According to the provisions of the European regulation, the labelling must indicate the high content of the disqualifying nutrient, which when removed from the calculation leads to a LIM 2 below 7.5.

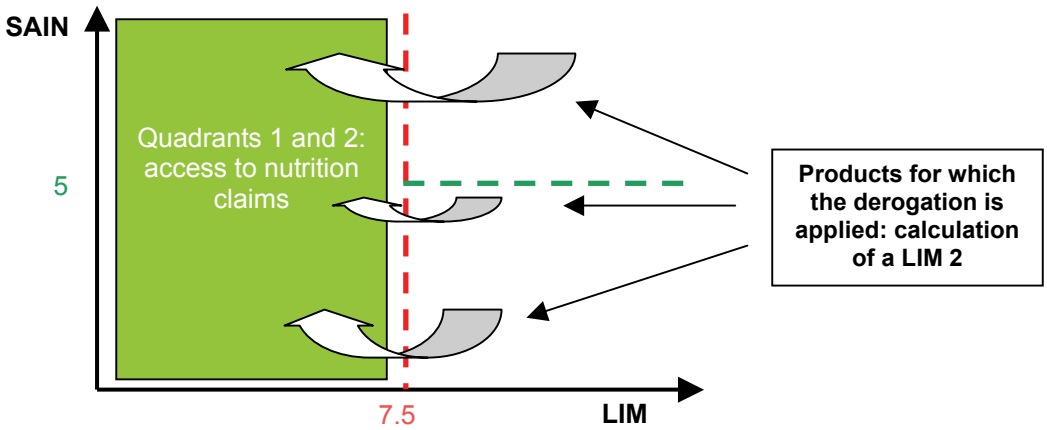

Figure 4: Conditions for access to nutrition claims with derogation

6.4.4 No claim

Foods with a SAIN 5_{opt} below 5, a LIM 3 higher than or equal to 7.5 and a LIM 2 greater than or equal to 7.5 present a low ND and disqualifying nutrient contents not permitting application of the derogation.

Afssa proposes that these foods should not have access to either nutrition or health claims.

These foods correspond to most of the foods negatively correlated to a "healthy diet" (Volatier et al., 2007, Quinio et al., 2006).

6.5 Example of results obtained with Afssa's proposal

6.5.1 Data used

The system (SAIN 5_{opt}, LIM 3) was tested on a selection of 613 foods consumed by the adults in the INCA 1 survey (excluding alcoholic beverages, fortified foods and foods providing no energy).
The nutrient compositions used in this example are from available composition tables (annex 2), and do not prejudge innovations or formulation modifications of products considered individually.

6.5.2 Graphic representation

The results obtained were plotted on a logarithmic scale graph, with SAIN 5_{opt} on the y axis and LIM 3 on the x axis (annex 5).
For the purposes of clarity, only a selection of the 613 foods was represented on the graphs. The selection was made on the basis of a representative sample of French dietary habits.
The equation lines X=7.5 (LIM reference point) and Y= 5 (SAIN reference point) are also represented, making it possible to visualise the position of the foods in the 4 quadrants.

6.5.3 Example of the classification results (SAIN, LIM)

The results presented below are an example, illustrating an application of the profiling scheme developed by Afssa, in the context of this request. Afssa recalls that the (SAIN, LIM) is a working tool, for which the parameters are adaptable. Hence, any new data deemed to be pertinent can be incorporated into this scheme, which is liable to modify the results obtained.

Table 4: Distribution of the 613 foods tested in the example, according to SAIN and LIM reference points

	LIM3 < 7.5	**LIM 3 ≥ 7.5**	
SAIN 5opt ≥ 5	223 (36.4%)	106 (17.2%)	308
SAIN 5opt < 5	55 (9%)	229 (37.4%)	305
	278	335	613

Table 5: Distribution of the 613 foods tested in the example, according to the criteria for the access to claims

	LIM_3 < 7.5	**LIM_3 ≥ 7.5**	
		LIM_2 < 7.5	**LIM_2 ≥ 7.5**
SAIN 5opt ≥ 5	223 (36.4%) Nutrition and health claim	173 (28.2%) Nutrition claim with derogation	162 (26.4%) No claim
SAIN 5opt < 5	55 (9%) Nutrition claim		
	278		

With the model tested, the following results are observed:
- a quarter of the foods tested have access to no claims;
- more than a third of the foods tested have access to nutrition and health claims;
- almost 40% of the foods tested only have access to nutrition claims, with or without derogation.

Table 5 presents the results obtained in this example, by food group. These results are detailed below.

Health claims
With the model tested, the following foods have access to health claims:
- 80% of fruit and vegetables (with the exception of certain processed fruit or vegetables);
- unrefined starchy foods (pulses, plain potatoes, wholemeal bread);
- half of “meat/fish/eggs” (plain eggs, lean meat and 70% of seafood);
- fresh dairy products containing little sugar or fat (such as quark containing 20% fidm), along with milk, irrespective of its fat content.

Nutrition claims without derogation
With the model tested, foods that have access to nutrition claims without derogation are all foods with access to health claims, along with:
- refined starchy foods;
- certain soft drinks, such as lemonade, sodas, pear nectar, shandy or non-alcoholic beer;

10% of fruit and vegetables (fruit juices, soups, fruits rich in sugars, certain nuts).

Nutrition claims with derogation
In this example, application of the derogation allows the following foods to have access to nutrition claims:
- fats (with the exception of salted butter);
- high-fat and/or sweetened dairy products;
- 17% of cheeses;
- 30% of “biscuits, snacks, desserts, soft drinks”-type products;
- smoked fish and seafood or fish and seafood tinned in oil and surimi;
- fatty meats and certain pork products.

Figure b of annex 5 illustrates application of the derogation, representing only foods for which the LIM 3 is greater than 7.5, with the LIM 2 on the x axis. This graph distinguishes, among the foods in quadrants 3 and 4, between which could have access to nutrition claims with derogation and those which would have access to no claims.

No access to claims
With the model tested, the foods with no access to any claim include:
- salted butter;
- 90% of pork products;
- 83% of cheeses;
- 70% of “biscuits, snacks, desserts, soft drinks”-type products

ketchup.

Table 6: Number and nature of foods with access to claims, according to the model tested

Type of product	Total number of foods	Nutrition claims and health claims		Nutrition claims without derogation		Nutrition claims with derogation		No claim	
		n	food	n	food	n	food	n	food
Seasonings	38	9	Spices, lemon juice, tomato sauce without meat	0		27	Unsalted butter, cream, oils, vinaigrette, mayonnaise, fatty sauces, mustard, sesame seeds, tomato sauce with meat, soy sauce	2	Salted butter, ketchup
Starchy foods	31	13	Pulses, wholemeal bread and plain potatoes	13	White bread, rye bread, pasta, , semolina, crisp breads, white & wholemeal rice	5	White sandwich bread, toasted bread, gnocchi, chips, dauphine potatoes	0	
refined	15			10	White bread, pasta, semolina, crisp breads, white rice	5	White sandwich bread, toasted bread, gnocchi, chips, dauphine potatoes	0	
unrefined	16	13	Pulses, wholemeal bread and plain potatoes	3	Rye bread, chestnuts, wholemeal rice	0		0	
Fruit, vegetables, nuts*	114	91	80% of fruit and vegetables: fresh fruit (excluding grapes and lychees) and dried fruit (excluding raisins and dates), vegetables, citrus juice, tomato juice and soups, carrot juice	15	Lychees, grapes (fresh and juice), apple juice, sweetcorn, almonds, hazelnuts, soups	8	Fruit salads, tinned grapefruit and apricots in syrup, apple purée, provençale-style tomatoes, unsalted nuts	0	
Ready meals, sandwiches	70	12	Dishes high in vegetables and low in fat (terrines, salads), "pot-au-feu", paella	7	Crudités sandwiches, pasta in tomato sauce, meat fritters	29	Dishes rich in SFAs and/or sodium with a high ED (gratins, quiches, tarts)	22	Sandwiches without crudités and/or hot sandwiches (hamburgers, toasted sandwiches), pastries, spring rolls, pizza
Cheese	52	0		0		9	Fresh goat's cheese, crottin, Neufchâtel, St Marcellin, vacherin, mozzarella, comté, gruyère, beaufort	43	83% of cheeses
Fresh dairy products, dairy desserts	43	16	All milks and natural plain yoghurts and low fat quark containing 0% and 20% fidm, soy-based desserts, natural plain yoghurts	1	Flavoured milk	22	Condensed whole milk, plain quark and petit-suisse containing 40% fidm, Flavoured or fruit yoghurts, flavoured or fruit quark and petit-suisse, sweetened plain yoghurt, dairy desserts	4	Petit-Suisse with fruit, custard, Liégeois
Biscuits, snacks, desserts, dairy desserts, sugary drinks	99	2	Orange nectar	13	Lemonade, sodas, pear nectar, shandy, alcohol-free beer, honey, , gingerbread, waffles	24	Sweets, sugar, green olives, salted peanuts and cashew nuts, sorbets, dairy desserts, fruit syrups	60	Crisps, black olives, pistachio nuts, taramasalata, salted snacks, sweet biscuits, cakes, sweet pastries, chocolate bars and sweets, ice cream
Meat, eggs, fish and seafood	166	80	Plain eggs, lean meats, poultry, offal (excluding brain), fish, plain cooked shellfish and crustaceans	6	Fried fish and seafood, meat fondue	50	Fatty meats, cooked eggs, tinned or smoked fish or seafood	30	Pork products, fatty meats (duck confit, veal paupiette, lamb kebab)
pork products	30	0		0		3	Chicken liver pâté, rillettes, bacon	27	90% of pork products
fish and seafood	71	49	70% of plain fish, shellfish and crustaceans	5	Fried fish and seafood	17	Smoked or tinned fish and seafood, surimi		
TOTAL	**613**	**223**		**55**		**174**		**161**	

* including soups and fruit juices without added sugar

6.5.4 Overall assessment of the example presented

The results of the proposed profiling tool described above reveal several relevant discriminations.

Meats, such as beef burgers, are positioned in different quadrants depending on their fat content. Hence lean meats present the NP required for access to health claims, certain fattier meats to nutrition claims with derogation, and very fatty meats and pork products have access to no types of claims.

The model presented in the example makes a distinction between fresh dairy products on the basis of their fat and/or sugar content: milks, plain yoghurts and quark containing 20% fidm and less present the required NP for access to health claims, whereas dairy desserts, quark containing more than 20% fidm and/or sugar only have access to nutrition claims with derogation.

A differentiation between cheeses on the basis of their ND is also observed: gruyère, beaufort, comté, fresh goat's cheese can all benefit from a derogation, whereas roquefort, tomme or camembert may not bear claims.

This system also differentiates between different types of oily fish on the basis of their sodium content: in the example presented, fresh oily fish or plain tinned oily fish has access to health claims, whereas smoked oily fish or fish tinned in oil has access to nutrition claims with derogation.

Among processed fruit and vegetables, the system differentiates between those for which processing does not considerably modify the initial nutrient composition (tinned vegetables and certain fruit or vegetable juices have access to health claims) from those for which processing leads to a more significant change in nutrient composition (fruit in syrup and purees have access to nutrition claims with derogation).

For some foods, this system does not make a distinction on the basis of the fat content (for example milks), on the basis of the source (for example vegetable or animal oils) or on the basis of the storage method (for example fresh fruit or fruit juices).

The case of liquids (drinks, milks) must be considered. Expression of the SAIN per 100kcal and of the LIM per 100g penalises products with a high ED but favours foods with a low ED. It therefore allows certain liquids that should be consumed only occasionally (such as soft drinks) to obtain scores providing access to nutrition or even health claims. This characteristic also explains why whole milk and skimmed milk obtain the same classification.

Similarly, it would be relevant to adapt the system (SAIN, LIM) to fats which contain only one type of nutrient, for which only the disqualifying aspects are taken into account.

Finally, Table 5 shows that the 70 products qualified as "ready meals" are evenly distributed in the four quadrants of the (SAIN, LIM) system. Furthermore, the majority of these foods are positioned in the (SAIN, LIM) plane close to the reference points (see Graph 2 in annex 5c). Hence, a change in the content of one of the SAIN and/or LIM nutrients could modify the classification of these foods. This observation highlights the importance of recipes in access to claims and suggests that this nutrient profiling scheme could promote innovation and evolution of the recipes for ready meals.

6.5.5 Conclusions and prospects for the (SAIN, LIM) scheme

The (SAIN, LIM) model is an across-the-board nutrient profiling scheme and does not therefore require the definition of food categories.

However, it leads, like any across-the-board nutrient profiling scheme, to misclassifications related to the definition of a single NP for foods that are nutritionally heterogeneous.

The formulas for calculation of the SAIN and LIM are continuous and linear. They imply definition of reference values and avoid the need for a weighting system between the variables used. Calculation of scores is therefore easy, on the basis of the nutrient composition of foods. It may be possible to consider taking into account the weight of each nutrient in the onset of diseases, but this would require the availability of precise data.

The (SAIN, LIM) system presents dual information that separately sums up, on the one hand the qualifying components of the food and, on the other hand its disqualifying components. This avoids compensation within a single score, which would hide some of the product's "qualities" and/or "faults".

The dietary reference intakes used in calculation of the SAIN and that of the LIM can be defined on the basis of the context of application of the profiling tool. Hence, the proposal developed in this report

fits into a national context, with the use of French ANCs, but in a European context, PRIs could be used.

Likewise, the optional nutrient scheme can be adapted to the objective set and enhance the performance of the profiling tool. The development of optional nutrient schemes could help evolve this profiling tool into a category-based scheme. It may be possible to use different optional nutrients depending on the previously defined characteristics of the food.

7 CONCLUSIONS AND RECOMMENDATIONS

The regulation on claims proposes a list of parameters that can be studied when determining NPs:

- the determination of NPs for foods in general and/or for food categories;
- the choice and balance of foods to be taken into account;
- the choice of quantities/reference basis;
- the NP calculation approach;
- feasibility and testing of the proposed scheme.

Afssa's reflection process has provided some responses to the questions put by DG-Sanco.

Category-based scheme or across-the-board scheme: definition of NPs for all foods or by previously determined food category?

Afssa proposes an across-the-board scheme, with derogation categories, the definition of which takes into account their contribution to a balanced diet and to intakes of one or more nutrients that are essential or relevant in terms of public health. In addition, this scheme makes it possible to take into consideration the dietary habits and traditions of the populations concerned.

Choice of nutrients

The choice of the number and nature of the nutrients is based on scientific and operational arguments:

- Afssa's studies show that the use of a high number of nutrients in the calculation of NPs does not lead to more relevant differentiation between foods; the choice of the nature of the nutrients took into account the correlations existing between nutrients within a same food;
- on an operational level, Afssa considers that the choice of a limited number of nutrients, widely listed in nutrient composition tables, is likely to favour the availability of reliable data and the feasibility of control measures.

Afssa proposes taking into account saturated fatty acids, added sugar and sodium in the general across-the-board scheme (with the exception of derogations).
However, Afssa considers that it is important not to restrict the scheme to taking into account exclusively disqualifying nutrients. Achieving a balanced diet requires not only limiting the intake of nutrients with a detrimental effect on health (disqualifying nutrients), but also ensuring a sufficient intake of the nutrients needed (qualifying) to cover nutritional requirements.

The choice of qualifying nutrients is based on their specific nutritional value or their value as markers of food groups contributing to meeting of nutritional recommendations aimed at ensuring a balanced diet.
Furthermore, correlations between nutrients within the same food represented a choice criterion.
Afssa proposes taking into account fibre, protein, vitamin C, iron and calcium in the general across-the-board scheme (with the exception of derogations).
Afssa considers that the contents of nutrients considered in calculation of the NP must be those before any addition of vitamin or mineral.
It may be possible to adapt this scheme, in the case of certain derogation categories, to the nutritional characteristics of the foods. This approach can be proposed for classification of fats, with the use of optional nutrients, or the classification of drinks, with calculation adapted to the way these foods are consumed.

NP calculation method

Afssa proposes a profiling system based on calculation of two separate scores, one for qualifying nutrients and one for disqualifying nutrients, without the possibility of compensation between the scores. In addition, this continuous scoring system limits threshold effects and makes it possible to monitor any changes in the nutrient composition of products.

The regulation stipulates that "nutrition claims shall be allowed where a single nutrient exceeds the nutrient profile provided that a statement about the specific nutrient appears in close proximity to, on the same side and with the same prominence as the claim".
This rule applies in the scheme proposed by Afssa, with calculation of a new NP in which this disqualifying nutrient is not taken into account.

Testing of the scheme

Afssa proposes a dual approach for validation of the profiling tool: a practical feasibility test and scientific validation. Pending a consensus with respect to the validation method, Afssa recommends application of several existing, complementary methods.

Reference base

Afssa considers that scientific data are required in order to be able to definitively rule on the choice between a weight-based, energy-based or mixed system.

Pending these new data and insofar as the public health objective highlighted on an international scale is to give priority to promoting foods with a high ND and a low ED ((WHO, 2003)), Afssa considers that the per 100kcal basis ought to be reserved for qualifying nutrients. In addition, Afssa has demonstrated the feasibility of simultaneous use of weight-based and energy-based systems within a two-dimensional nutrient profiling scheme (example of the model proposed by Afssa presented in chapter 6).

All these responses have been incorporated into implementation of the (SAIN, LIM) nutrient profiling scheme proposed by Afssa in this report.

8 GLOSSARY

Nutrient profile: overall expression of the nutritional quality of a food, obtained by application of a nutrient profiling scheme

Nutrient profiling: classification of foods on the basis of their nutrient composition

Categorisation: grouping together of foods on the basis of predefined criteria, which may be regulatory, nutritional or related to usage

Classification: grouping together of foods resulting from application of a nutrient profiling scheme

Sensitivity (of a nutrient profiling scheme): capacity to identify foods for which consumption is correlated with meeting nutritional recommendations

Specificity (of a nutrient profiling scheme): capacity to misclassify (in error) foods associated with meeting nutritional recommendations

Performance (of a nutrient profiling scheme): overall assessment, based on the scheme's specificity and sensitivity

Derogation categories: in an across-the-board nutrient profiling scheme, category of foods for which calculation of the nutrient profile is adapted

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10 ANNEXES

Annex 1 : Terms of the request

2005 - SA - 0027

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A.F.S.S.A. REÇU LE 25 AOUT 2004 11h 11461 DIRECTION GÉNÉRALE

Martin Hirsch
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Paris, le 23 août 2004

Référence du courrier : S4-2004
Dossier suivi par Hélène Moraut et Eric Bonneff
Tel : 01.44.93.19.56 et 01.44.93.19.34

A.F.S.S.A. Reçu le 27 AOUT 2004 1071 D.E.R.N.S.

OBJET : Saisine

Monsieur le Directeur,

Il est aujourd'hui parfaitement établi que les déséquilibres alimentaires participent de façon essentielle au développement et à l'expression clinique des maladies qui sont aujourd'hui les plus répandues en France (maladies cardiovasculaires, obésité, diabète, etc.). Or les réglementations en vigueur, notamment en matière d'étiquetage nutritionnel et d'allégations nutritionnelles et santé, ne permettent pas aux consommateurs de disposer d'informations pertinentes et facilement compréhensibles pour les aider à choisir les aliments les plus appropriés à un régime alimentaire équilibré.

Le concept de profil nutritionnel des aliments apparaît de plus en plus régulièrement dans les débats sur la nutrition. Ce concept nous paraît tout à fait intéressant pour servir de base à l'élaboration d'une politique globale en matière de nutrition. C'est pourquoi nous saisissons l'AFSSA pour qu'elle réalise une étude comparative exhaustive des différents modèles de classification nutritionnelle existant à ce jour et qu'elle nous fournisse des lignes directrices pour l'élaboration d'un tel profil.

En vous remerciant par avance de l'attention que vous porterez à cette demande, je vous prie d'agréer, Monsieur de Directeur, mes sincères salutations.

Sylvie Pradelle,

P/O

Présidente de la commission
agriculture et alimentation et
Vice-Présidente de l'UFC-Que Choisir.

UNION FÉDÉRALE DES CONSOMMATEURS-QUE CHOISIR • Association loi 1901 • SIRET 784 672 495 00040 • APE 913 E
Membre de Consumers International (C.I.) et du Bureau Européen des Unions de Consommateurs (B.E.U.C.)

Annex 2 : Nutritional composition data of the 613 foods tested

Nutritional data of the 613 foods tested are presented in different tables for the purpose of readability and to facilitate the search of a particular food. This food grouping is not the result of a food categorization system, as defined in this report.

HERBS, SPICES AND SEASONINGS													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Butter spread, low fat	401,00	7,00	0,00	0,00	23,00	0,20	0,01	190,00	0,00	27,00	0,8	42,9	3,0
Cream, fluid, sterilized	294,90	2,30	0,00	0,00	50,00	0,20	0,20	30,00	0,00	19,30	1,0	29,6	0,5
Cream, light, thick or fluid	165,00	3,00	0,00	1,00	94,00	0,10	0,20	45,00	0,00	9,50	2,5	14,9	0,7
Wheat germ	323,20	25,00	14,50	0,00	55,00	7,60	0,70	9,00	0,00	1,80	11,0	2,8	0,1
Garlic	130,50	7,00	1,50	30,00	38,00	1,40	0,00	17,00	0,00	0,10	*9,1*	0,3	0,2
Chive or spring onion, raw	25,00	3,00	2,70	60,00	86,00	1,50	0,00	3,00	0,00	0,12	*73,2*	0,2	0,1
Curry powder	287,10	11,10	4,34	5,00	560,00	66,00	0,00	52,00	0,00	3,20	*43,8*	5,4	0,8
Parsley, raw	27,70	4,40	2,70	200,00	200,00	5,50	0,00	44,00	0,00	0,06	*191,8*	0,6	0,1
Pepper, black, ground	221,70	10,00	25,00	0,00	240,00	16,00	0,00	16,00	0,00	0,90	*24,4*	1,5	0,3
Vinegar	3,20	0,20	0,00	0,00	15,00	0,50	0,00	20,00	0,00	0,00	*37,3*	0,2	0,1
Soy sauce	57,60	6,90	0,81	0,00	18,00	2,40	0,00	5717,00	7,50	0,00	*12,2*	65,4	7,5
Coconut, kernel, dry	594,00	6,20	6,60	1,00	28,00	3,40	0,00	32,00	0,00	49,90	*2,3*	75,9	0,5
Sesame seed	598,00	18,20	7,90	0,00	975,00	14,55	0,00	11,00	0,00	6,96	*9,5*	10,7	0,2
Lemon juice, raw, unsweetened	16,90	0,40	0,10	52,00	7,00	0,10	0,00	1,00	0,00	0,00	*59,0*	0,1	0,1
Sauce bechamel	98,01	3,40	0,18	0,97	102,86	0,19	0,08	432,35	0,00	3,62	4,2	10,1	6,9
Sauce, Mornay	140,01	5,73	0,13	0,84	169,30	0,53	0,38	437,31	0,00	5,55	5,7	13,0	6,9
Tomato sauce, without meat	58,07	1,24	1,47	13,44	23,83	0,86	0,00	540,00	0,99	0,50	*10,2*	7,1	2,1
Tomato sauce, with meat	114,40	4,60	1,70	0,00	23,00	1,70	0,00	400,00	0,00	2,80	*5,3*	8,5	6,3
Ketchup	115,60	2,00	1,20	15,00	19,00	0,90	0,00	1120,00	17,80	0,06	*5,3*	23,8	17,9
Mustard	134,00	6,00	2,95	3,00	93,00	1,90	0,00	2245,00	0,00	1,00	*7,4*	25,2	2,3
Sauce, barbecue	70,79	0,18	0,18	1,29	8,29	0,15	0,00	405,64	16,44	0,03	*1,2*	15,3	6,5
Sauce, bearnaise	382,63	5,68	0,37	5,53	38,25	1,12	1,25	435,09	0,00	23,62	2,7	40,4	6,9
Sauce, hollandaise	587,74	4,13	0,10	0,89	41,96	1,40	1,87	403,82	0,00	37,78	2,1	61,5	6,4

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FATS (Lipids ≥ 97 % TEI)																		
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	Vitamin E (mg)	Mono-insaturated fatty acids (mg)	alpha-linolenic acid (mg)	sain5opt	sain5opDLip97	sain5opD2Lip97	LIM 3	LM 2
Butter	747,30	0,70	0,00	0,00	15,00	0,20	1,30	12,00	0,00	52,30	10,00	10,90	0,31	0,8	1,5	2,4	79,4	0,2

FATS (Lipids ≥ 97 % TEI)																		
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	Vitamin E (mg)	Mono-insaturated fatty acids (mg)	alpha-linolenic acid (mg)	sain5opt	sain5opDLip97	sain5opD2Lip97	LIM 3	LM 2
Butter, salted	746,90	0,60	0,00	0,00	15,00	0,20	0,76	870,00	0,00	52,30	2,00	23,40	0,60	0,5	1,5	2,4	88,4	13,8
Oil, peanut	899,10	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	19,80	2,00	23,40	0,60	0,8	1,5	*2,4*	79,4	0,1
Oil, colza	899,10	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	6,20	0,50	4,20	0,12	0,5	1,5	*2,4*	88,4	0,1
Oil, walnut	899,10	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	9,30	0,80	8,70	0,22	*0,0*	3,2	*6,0*	30,0	0,1
Oil, olive	899,10	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	14,50	17,20	55,50	0,10	*0,0*	12,4	*15,4*	9,4	0,1
Oil, sunflower seed	899,10	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	11,60	15,00	60,00	10,00	*0,0*	14,8	*16,8*	14,1	0,1
Vegetable oil, blended, balanced	899,10	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	11,50	10,80	17,00	12,00	*0,0*	3,6	*5,8*	22,0	0,1
Margarine, soft, sunflower seed	746,90	0,80	0,00	0,00	27,00	0,00	0,00	118,00	0,00	18,50	12,00	72,00	0,85	*0,0*	10,4	*11,5*	17,6	1,9
Margarine, reduced fat, sunflower seed	378,30	0,70	0,00	0,00	12,00	0,00	0,00	100,00	0,00	13,30	56,00	21,50	0,10	*0,0*	14,8	*16,6*	17,4	1,6
Mayonnaise	761,59	1,96	0,15	2,00	18,81	0,71	0,48	449,99	0,00	12,01	80,00	36,20	1,20	*0,1*	9,7	*12,5*	29,3	7,1
Mayonnaise, reduced fat	402,32	2,20	0,17	2,47	24,00	0,79	0,53	414,58	0,00	6,58	43,00	46,50	1,00	*0,1*	2,8	*5,0*	21,2	6,6
Salad dressing, olive oil & vinegar	663,84	0,15	0,25	0,00	6,35	0,29	0,00	393,56	0,00	10,67	6,00	18,50	0,50	0,6	6,5	*8,8*	23,0	6,2
Salad dressing, oil and vinegar, low fat	333,51	0,15	0,25	0,00	9,05	0,28	0,00	386,52	0,00	5,05	21,00	1,60	0,50	1,3	6,6	*8,7*	14,4	6,1
Seasoning (average)	663,84	0,15	0,25	0,00	6,35	0,29	0,00	393,56	0,00	8,46	0,00	0,00	0,02	*0,1*	3,7	*5,9*	20,3	6,2

DRINKS – SOUPS - MILKS													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Pineapple juice, reconstituted	50,10	0,40	0,10	9,00	15,00	0,30	0,00	1,00	6,50	0,00	*5,3*	17,0	0,1
Carrot juice, canned	30,90	0,70	0,80	7,00	24,00	0,50	0,00	35,00	0,00	0,00	*11,2*	4,3	0,1
Orange juice, reconstituted, pasteurised	36,10	0,70	0,20	50,00	11,00	0,40	0,00	1,00	0,90	0,00	*28,7*	0,4	0,1
Apple juice, reconstituted, pasteurised	45,30	0,10	0,09	1,20	6,00	0,30	0,00	2,00	0,00	0,00	*2,1*	0,6	0,1
Grapefruit juice, reconstituted, pasteurised	33,70	0,50	0,10	38,00	10,00	0,20	0,00	1,00	1,60	0,00	*22,8*	0,1	0,1
Grape juice, pasteurised	62,50	0,40	0,10	1,00	17,00	0,30	0,00	2,00	0,00	0,00	*2,0*	1,1	0,1
Tomato juice, pasteurised	20,10	0,80	0,70	14,00	13,00	0,50	0,00	280,00	0,00	0,00	*22,1*	0,1	0,1
Whole milk, raw	63,60	3,20	0,00	2,00	119,00	0,10	0,03	45,00	0,00	2,20	6,7	3,0	0,7
Whole milk, UHT	62,70	3,20	0,00	0,60	119,00	0,10	0,01	45,00	0,00	2,10	6,3	3,8	0,7
Whole milk, condensed	144,30	6,39	0,00	0,99	255,00	0,21	0,09	138,00	0,00	5,70	5,9	3,7	2,2
Semi-skimmed milk, UHT	45,60	3,20	0,00	1,10	114,00	0,10	0,01	46,00	0,00	0,95	8,6	10,1	0,7
Semi-skimmed milk, pasteurised	45,60	3,20	0,00	3,00	114,00	0,04	0,01	46,00	0,00	0,95	9,1	1,9	0,7

DRINKS – SOUPS - MILKS													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Semi-skimmed milk, dried, reconstituted	44,06	2,98	0,00	0,40	105,00	0,03	0,00	51,00	0,00	0,97	*7,7*	1,9	0,8
Skimmed milk, UHT	33,40	3,30	0,00	1,00	112,00	0,10	0,01	45,00	0,00	0,10	*11,6*	2,0	0,2
Skimmed milk, dried, reconstituted	34,72	3,55	0,00	0,60	130,10	0,05	0,00	68,20	0,00	0,05	*12,0*	0,6	0,1
Milk, flavoured	62,50	2,20	0,00	1,00	83,00	0,10	0,01	46,00	6,50	0,77	*4,6*	0,8	2,5
Beer, alcohol-free	20,20	0,30	0,00	0,00	6,00	0,00	0,00	5,00	3,00	0,00	*1,1*	6,0	0,1
Shandy (Beer + lemonade)	37,85	0,15	0,00	0,01	5,50	0,04	0,00	4,00	4,40	0,00	*0,6*	2,1	0,1
Lemonade	38,00	0,00	0,00	0,01	5,00	0,08	0,00	3,00	8,80	0,00	*0,6*	3,0	0,1
Carbonated beverage, cola	40,00	0,00	0,00	0,00	5,00	0,00	0,00	9,00	10,00	0,00	*0,3*	5,9	0,1
Pear nectar	64,50	0,20	0,10	2,00	5,00	0,10	0,00	3,00	9,00	0,00	*1,2*	6,8	0,1
Beverage base, chocolate flavoured, sweetened (powder) diluted	39,30	0,60	0,42	0,00	5,90	0,25	0,00	14,00	7,70	0,29	*2,7*	6,0	0,9
Beverage base, malted (powder), reconstituted	92,92	0,34	0,00	0,00	3,70	0,04	0,00	4,80	11,24	0,50	*0,3*	5,7	1,2
Orange nectar	55,30	0,40	0,10	15,00	15,00	0,10	0,00	3,00	10,00	0,00	*6,2*	8,3	0,1
Lemonade, flavoured	44,00	0,00	0,00	0,00	5,00	0,07	0,00	10,00	11,00	0,00	*0,5*	6,7	0,2
Apricot nectar	57,70	0,40	0,60	3,00	7,00	0,40	0,00	2,00	9,00	0,00	*3,4*	7,4	0,1
Carbonated beverage, orange	44,00	0,00	0,00	6,00	5,00	0,07	0,00	10,00	11,00	0,00	*3,0*	6,0	0,2
Broth, reconstituted	3,68	0,40	0,00	0,00	3,60	0,02	0,00	300,00	0,00	0,08	*0,6*	7,4	0,1
Soup, lentil	66,88	3,88	4,62	1,53	18,36	1,60	0,02	250,00	0,00	0,90	*6,4*	6,8	0,2
Soup, vegetable (average)	30,30	0,57	1,32	3,30	14,98	0,28	0,00	250,00	0,00	0,01	*12,2*	3,3	2,0
Soup, chicken noodle	34,60	2,33	0,30	0,00	16,17	0,18	0,00	350,00	0,00	0,38	*8,6*	4,0	0,1
Soup, onion	41,47	1,77	0,58	1,41	19,24	0,16	0,03	224,00	0,00	1,61	*4,7*	2,7	0,9
Soup, cream of mushroom	37,76	0,89	0,59	0,25	12,47	0,20	0,05	250,00	0,00	0,78	*4,7*	4,3	3,6
Soup, cream of tomato	37,43	0,63	0,92	4,14	14,10	0,43	0,00	250,00	1,17	0,23	*4,1*	4,8	1,8
Soup, minestrone	48,94	2,23	1,01	1,74	21,49	0,43	0,03	387,00	0,00	1,42	*7,2*	3,8	1,7

STARCHY FOODS													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Chestnut	175,20	3,00	5,66	0,00	40,00	0,90	0,00	9,00	0,00	0,30	*4,4*	0,5	0,1
Broad bean	56,50	5,80	4,10	12,00	24,00	1,00	0,00	4,00	0,00	0,08	*16,6*	0,2	0,1
Haricot bean, boiled	94,10	6,70	6,33	0,00	71,00	2,80	0,00	250,00	0,00	0,10	*14,0*	2,8	0,2
Red kidney bean, boiled	92,90	8,40	10,35	1,00	66,00	2,50	0,00	3,00	0,00	0,10	*17,8*	0,2	0,1
Lentil, boiled	87,70	8,20	9,09	0,00	19,00	3,30	0,00	3,00	0,00	0,06	*17,7*	0,1	0,1
Split pea	108,00	8,30	6,00	0,00	12,00	1,50	0,00	2,00	0,00	0,05	*9,3*	0,1	0,1

STARCHY FOODS													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Chick pea	132,90	8,90	3,99	0,01	56,00	2,80	0,00	6,00	0,00	0,30	*8,8*	0,5	0,1
Dwarf kidney bean, canned	74,50	6,30	6,30	0,00	42,00	1,80	0,00	250,00	0,00	0,10	*14,5*	2,8	0,2
Bread, French baguette	265,00	8,00	2,90	0,00	23,00	1,40	0,00	500,00	0,00	0,23	*2,8*	5,6	0,5
Bread, plain, toasted at home	294,50	10,10	5,20	0,00	85,00	2,20	0,00	650,00	0,00	0,60	*4,3*	7,8	1,4
Bread, country style, from bakery	262,10	9,10	5,10	0,00	22,00	1,40	0,00	500,00	0,00	0,20	*3,7*	5,6	0,5
Bread, sandwich loaf	269,20	8,00	3,30	0,00	91,00	1,20	0,00	500,00	1,50	0,96	*3,4*	7,7	3,7
Crisp bread/rusk, plain	379,40	10,00	7,50	0,00	42,00	1,30	0,00	350,00	2,00	1,40	*3,2*	7,2	5,2
Rice, parboiled	135,80	2,60	0,70	0,00	18,00	0,20	0,00	100,00	0,00	0,00	*1,5*	1,1	0,1
Rice, white	116,20	2,30	0,70	0,00	4,00	0,20	0,00	100,00	0,00	0,00	*1,4*	1,1	0,1
Pasta, boiled	115,60	4,00	1,82	0,00	7,00	0,60	0,00	100,00	0,00	0,30	*3,3*	1,5	0,7
Pasta, egg, boiled	121,20	4,70	1,76	0,00	10,00	0,40	0,30	100,00	0,00	0,30	4,1	1,5	0,7
Couscous grains, cooked	114,40	4,20	1,60	0,00	7,00	0,40	0,00	100,00	0,00	0,10	*2,9*	1,2	0,2
Gnocchi	140,76	5,27	0,69	0,47	123,68	0,40	0,20	276,17	0,00	4,64	4,5	9,9	4,4
Bread, wholemeal, from bakery	229,00	9,00	7,50	0,00	58,00	2,00	0,00	500,00	0,00	0,35	*5,8*	5,8	0,8
Bread, rye + wheat, from bakery	231,80	6,70	5,40	0,00	26,00	2,40	0,00	500,00	0,00	0,13	*4,7*	5,5	0,3
Rice, wholegrain, boiled	115,60	2,50	1,75	0,00	9,00	0,50	0,00	100,00	0,00	0,20	*2,7*	1,4	0,5
Oat porridge, made with water	115,67	4,33	3,00	0,00	20,00	1,40	0,00	1,33	0,33	0,33	*5,5*	0,7	0,4
Potato, baked	101,30	2,30	2,10	10,00	7,00	0,60	0,00	7,00	0,00	0,00	*5,3*	0,1	0,1
Potato, boiled	78,90	1,50	1,90	9,00	6,00	0,30	0,00	100,00	0,00	0,00	*5,4*	1,1	0,1
Potato chip (French fry), salted	270,20	3,80	2,20	12,00	15,00	0,90	0,00	250,00	0,00	4,00	*2,5*	8,7	4,0
Potato ball, precooked, frozen	137,03	1,38	1,74	8,26	5,78	0,28	0,00	388,33	0,00	1,42	*2,8*	6,3	3,2
Mashed potatoes	77,89	1,48	1,88	8,87	6,39	0,31	0,00	100,00	0,00	0,00	*5,4*	1,1	0,1
Dauphine potatoes, cooked	225,66	4,29	1,35	4,97	16,51	0,66	0,41	430,89	0,00	5,58	2,7	13,0	6,8
Sweet potato	99,50	1,20	1,70	25,00	22,00	0,70	0,00	19,00	0,00	0,05	*7,9*	0,3	0,1
Potatoes, pan-fried	112,36	1,44	1,79	8,47	7,04	0,29	0,00	250,00	0,00	0,86	*3,6*	3,9	2,0

FRUITS – VEGETABLES - OLEAGINOUS													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Avocado	145,40	1,80	5,10	11,00	16,00	1,00	0,00	7,00	0,00	2,90	*5,9*	4,5	0,1
Beetroot	37,30	1,50	2,03	5,00	14,00	0,70	0,00	64,00	0,00	0,00	*11,9*	0,7	0,1
Carrot, raw	29,60	0,80	2,70	7,00	27,00	0,30	0,00	35,00	0,00	0,00	*16,1*	0,4	0,1
Endive (US chicory), raw	12,20	1,60	1,60	10,00	55,00	1,00	0,00	14,00	0,00	0,05	*52,6*	0,2	0,1

FRUITS – VEGETABLES - OLEAGINOUS													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Red cabbage, raw	23,40	1,40	2,59	57,00	52,00	0,50	0,00	10,00	0,00	0,03	*63,3*	0,2	0,1
Cucumber, raw	11,70	0,70	0,76	7,00	19,00	0,30	0,00	3,00	0,00	0,04	*25,6*	0,1	0,1
Watercress	12,70	2,20	2,47	60,00	157,00	1,30	0,00	60,00	0,00	0,06	*150,6*	0,7	0,1
Witlof, raw	9,50	1,00	1,40	7,00	20,00	0,20	0,00	4,00	0,00	0,06	*36,5*	0,1	0,1
Cos lettuce, raw	12,70	1,20	1,38	8,00	37,00	0,30	0,00	15,00	0,00	0,04	*33,3*	0,2	0,1
Dandelion leaves, raw	38,10	2,70	1,60	35,00	165,00	3,10	0,00	76,00	0,00	0,10	*44,9*	1,0	0,2
Radish	15,50	0,60	1,48	23,00	20,00	0,80	0,00	12,00	0,00	0,05	*46,9*	0,2	0,1
Tomato, raw	19,00	0,80	0,87	18,00	9,00	0,40	0,00	5,00	0,00	0,03	*26,6*	0,1	0,1
Celeriac, raw	16,50	1,50	1,80	8,00	43,00	0,70	0,00	100,00	0,00	0,03	*32,9*	1,1	0,1
Pepper, sweet, green	16,30	0,80	1,50	127,00	6,00	0,30	0,00	6,00	0,00	0,05	*154,3*	0,1	0,1
Radish, black	57,90	2,80	2,10	100,00	105,00	1,40	0,00	9,00	0,00	0,05	*43,7*	0,2	0,1
Corn salad	19,60	2,00	1,60	38,00	38,00	2,20	0,00	4,00	0,00	0,05	*67,2*	0,1	0,1
Green salad, without seasoning	13,74	1,48	1,59	17,41	49,81	0,80	0,00	16,70	0,00	0,04	*53,0*	0,2	0,1
Salad, vegetable, without dressing	25,50	1,10	2,02	19,00	28,00	0,45	0,00	28,00	0,00	0,02	*26,5*	0,3	0,1
Apricot, dried	178,60	4,00	8,10	8,00	55,00	5,20	0,00	14,00	0,00	0,05	*10,5*	0,2	0,1
Date, dried	290,50	2,50	8,70	2,00	62,00	3,00	0,00	3,00	0,00	0,25	*4,9*	0,4	0,1
Fig, dried	250,80	3,20	10,33	0,00	160,00	2,50	0,00	14,00	0,00	0,24	*6,7*	0,5	0,2
Prune	173,70	2,50	6,10	1,50	50,00	2,90	0,00	12,00	0,00	0,04	*6,7*	0,2	0,1
Raisin	278,10	2,60	4,55	4,00	40,00	2,40	0,00	23,00	0,00	0,15	*3,6*	0,5	0,3
Apricot, raw	44,10	0,80	1,57	7,00	16,00	0,40	0,00	2,00	0,00	0,01	*8,5*	0,1	0,1
Pineapple, raw	48,60	0,40	1,21	18,00	15,00	0,30	0,00	2,00	0,00	0,00	*10,7*	0,1	0,1
Banana, raw	91,10	1,10	1,84	12,00	8,00	0,40	0,00	1,00	0,00	0,10	*5,3*	0,2	0,1
Black currant, raw	42,10	1,30	5,61	200,00	60,00	1,30	0,00	3,00	0,00	0,00	*106,1*	0,1	0,1
Cherry, raw	67,30	1,30	1,70	6,00	17,00	0,40	0,00	3,00	0,00	0,02	*5,7*	0,1	0,1
Lemon, raw	14,60	0,70	2,30	52,00	25,00	0,50	0,00	4,00	0,00	0,03	*88,1*	0,1	0,1
Fig, raw	67,40	0,90	1,74	5,00	60,00	0,80	0,00	3,00	0,00	0,04	*7,7*	0,1	0,1
Strawberry, raw	34,40	0,70	1,98	60,00	20,00	0,40	0,00	2,00	0,00	0,02	*40,1*	0,1	0,1
Raspberry, raw	38,20	1,20	3,06	25,00	22,00	0,70	0,00	3,00	0,00	0,02	*23,5*	0,1	0,1
Passion fruit, raw	54,40	2,60	1,50	28,00	12,00	0,80	0,00	10,00	0,00	0,20	*15,9*	0,4	0,2
Pomegranate, raw	60,60	1,00	2,24	20,00	13,00	1,00	0,00	4,00	0,00	0,03	*12,6*	0,1	0,1
Red currant, raw	25,30	1,10	3,50	40,00	36,00	1,20	0,00	3,00	0,00	0,00	*51,9*	0,1	0,1
Kiwi fruit, raw	49,40	1,10	2,77	80,00	27,00	0,40	0,00	4,00	0,00	0,04	*37,1*	0,1	0,1

FRUITS – VEGETABLES - OLEAGINOUS													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Lychee, raw	63,80	0,90	0,80	8,00	5,00	0,40	0,00	1,00	0,00	0,00	*4,9*	0,1	0,1
Clementine or Mandarin orange, raw	44,60	0,70	1,91	41,00	33,00	0,40	0,00	3,00	0,00	0,02	*23,7*	0,1	0,1
Mango, raw	57,80	0,60	0,90	44,00	20,00	1,20	0,00	2,00	0,00	0,05	*19,5*	0,1	0,1
Melon, raw	36,60	0,70	0,66	25,00	14,00	0,20	0,00	18,00	0,00	0,05	*16,2*	0,3	0,1
Mirabelle plum, raw	51,70	0,70	1,50	7,20	12,00	0,50	0,00	0,01	0,00	0,01	*7,3*	0,1	0,1
Blueberry, raw	49,40	0,60	2,50	20,00	9,00	0,50	0,00	2,00	0,00	0,02	*13,8*	0,1	0,1
Nectarine, raw	45,30	0,90	1,47	20,00	7,00	0,20	0,00	4,00	0,00	0,01	*12,3*	0,1	0,1
Orange, raw	40,20	1,00	2,10	53,00	40,00	0,10	0,00	4,00	0,00	0,03	*31,5*	0,1	0,1
Watermelon, raw	29,90	0,50	0,34	11,00	7,00	0,20	0,00	2,00	0,00	0,00	*9,7*	0,1	0,1
Pear, with skin, raw	53,10	0,40	2,76	5,00	10,00	0,20	0,00	2,00	0,00	0,02	*7,1*	0,1	0,1
Apple, with skin, raw	50,70	0,30	2,40	5,00	5,00	0,20	0,00	3,00	0,00	0,06	*6,6*	0,1	0,1
Grapefruit, raw	27,30	0,70	1,27	37,00	19,00	0,20	0,00	0,00	0,00	0,01	*31,9*	0,1	0,1
Greengage plum, raw	52,10	0,80	1,50	5,00	13,00	0,40	0,00	1,00	0,00	0,01	*6,3*	0,1	0,1
Peach, flesh and skin, raw	42,90	0,50	2,30	7,00	10,00	0,40	0,00	1,00	0,00	0,01	*9,6*	0,1	0,1
Grape, white, raw	67,70	0,60	1,36	4,00	19,00	0,30	0,00	2,00	0,00	0,03	*4,3*	0,1	0,1
Grape, red, raw	65,30	0,60	1,62	4,00	4,00	0,30	0,00	2,00	0,00	0,03	*4,3*	0,1	0,1
Japanese persimmon, raw	66,70	0,70	2,50	7,00	21,00	0,40	0,00	2,00	0,00	0,03	*6,9*	0,1	0,1
Stewed fruits, low calorie, canned	70,13	0,50	2,10	10,08	72,40	0,26	0,00	2,52	8,30	0,00	*8,1*	5,6	0,1
Lychee, canned	51,85	0,51	0,45	4,51	5,83	0,23	0,00	1,19	3,96	0,00	*3,5*	2,7	0,1
Applesauce, canned	76,00	0,18	1,20	1,70	4,00	0,35	0,00	28,00	16,00	0,03	*2,6*	11,0	0,5
Fruit cocktail, canned	67,70	0,40	0,97	10,00	22,00	0,50	0,00	1,00	12,60	0,00	*5,9*	8,4	0,1
Grapefruit, canned	32,00	0,63	1,10	34,40	12,00	0,09	0,00	0,00	13,00	0,01	*24,2*	8,7	0,1
Apricot, canned in light syrup	67,70	0,40	0,97	10,00	22,00	0,50	0,00	1,00	12,60	0,00	*5,9*	8,4	0,1
Pumpkin	29,30	1,10	2,85	12,00	26,00	1,20	0,00	35,00	0,00	0,05	*24,9*	0,4	0,1
Artichoke	18,20	2,90	7,70	6,00	44,00	1,00	0,00	15,00	0,00	0,05	*58,9*	0,2	0,1
Asparagus, boiled	19,50	2,70	2,00	10,00	21,00	0,70	0,00	3,00	0,00	0,07	*29,9*	0,1	0,1
Eggplant, boiled	17,30	1,00	3,50	2,00	8,00	0,30	0,00	3,00	0,00	0,02	*23,9*	0,1	0,1
Swiss chard, boiled	17,30	1,80	1,30	18,00	80,00	2,30	0,00	35,00	0,00	0,02	*59,7*	0,4	0,1
Broccoli, boiled	20,80	3,00	3,21	60,00	76,00	1,00	0,00	9,00	0,00	0,06	*85,0*	0,2	0,1
Carrot, boiled	25,90	0,80	3,23	2,00	29,00	0,50	0,00	37,00	0,00	0,05	*17,9*	0,5	0,1
Mushroom, canned	14,80	2,30	2,50	2,00	23,00	0,80	0,00	250,00	0,00	0,05	*32,9*	2,7	0,1
Brussels sprout, boiled	26,10	2,60	4,57	60,00	27,00	0,90	0,00	5,00	0,00	0,10	*66,7*	0,2	0,1

FRUITS – VEGETABLES - OLEAGINOUS													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Cabbage, green boiled	14,30	1,20	3,30	20,00	31,00	0,20	0,00	8,00	0,00	0,04	*53,5*	0,1	0,1
Cauliflower, boiled	17,90	2,00	2,23	38,00	16,00	0,40	0,00	8,00	0,00	0,05	*57,6*	0,2	0,1
Palm heart, canned	43,40	2,80	1,50	7,00	44,00	0,40	0,00	250,00	0,00	0,00	*11,4*	2,6	0,1
Courgette (zucchini)	13,30	0,60	0,85	6,00	16,00	0,30	0,00	2,00	0,00	0,02	*21,0*	0,1	0,1
Celeriac stalk, boiled	9,80	0,80	1,30	6,00	43,00	0,30	0,00	81,00	0,00	0,05	*38,9*	0,9	0,1
Celeriac, boiled	16,10	1,00	1,80	4,00	40,00	0,70	0,00	62,00	0,00	0,03	*27,9*	0,7	0,1
Spinach, steamed	17,10	2,80	2,77	10,00	112,00	2,40	0,00	57,00	0,00	0,03	*65,6*	0,6	0,1
Fennel	16,30	1,10	2,22	8,00	37,00	0,50	0,00	15,00	0,00	0,05	*31,8*	0,2	0,1
Bean, mung sprout, canned	12,90	2,00	1,20	1,00	31,00	0,60	0,00	250,00	0,00	0,00	*26,4*	2,6	0,1
Green bean, boiled	18,50	1,30	2,00	6,60	43,00	1,60	0,00	100,00	0,00	0,04	*36,3*	1,1	0,1
Turnip, boiled	15,70	0,80	2,50	11,00	33,00	0,30	0,00	39,00	0,00	0,00	*34,8*	0,4	0,1
Onion, boiled	28,90	1,00	2,38	6,00	23,00	0,30	0,00	4,00	0,00	0,02	*14,9*	0,1	0,1
Pea, green, canned	72,60	4,40	4,50	13,00	23,00	1,50	0,00	255,00	0,00	0,20	*14,1*	3,0	0,5
Leek, boiled	20,90	1,20	3,40	7,00	19,00	0,50	0,00	7,00	0,00	0,01	*26,7*	0,1	0,1
Pepper, sweet, green or red, boiled	25,90	1,00	1,50	100,00	8,00	0,40	0,00	2,00	0,00	0,05	*79,2*	0,1	0,1
Salsify, boiled	27,00	2,20	1,60	4,00	34,00	0,40	0,00	250,00	0,00	0,05	*15,1*	2,7	0,1
Tomato, peeled, canned	16,50	0,90	0,90	6,50	16,00	0,70	0,00	101,00	0,00	0,02	*22,1*	1,1	0,1
Sweetcorn on cob, boiled	110,20	3,40	1,50	12,00	3,00	0,60	0,00	17,00	0,00	0,20	*4,9*	0,5	0,3
Vegetable mix, canned	43,83	2,98	3,73	6,21	35,11	1,32	0,00	250,00	0,00	0,09	*18,1*	2,8	0,2
Cardoon	18,20	2,90	7,70	6,00	44,00	1,00	0,00	15,00	0,00	0,05	*58,9*	0,2	0,1
Sweetcorn, canned	95,60	3,00	2,00	1,00	4,00	0,60	0,00	250,00	0,00	0,20	*3,9*	2,9	0,5
cabbage, red, boiled	18,70	1,00	2,60	33,00	37,00	0,40	0,00	3,00	0,00	0,04	*52,7*	0,1	0,1
Witlof, boiled	9,10	1,20	1,40	2,00	20,00	0,30	0,00	3,00	0,00	0,06	*30,5*	0,1	0,1
Sauerkraut, without meat	14,70	1,30	2,70	17,00	36,00	0,50	0,00	400,00	0,00	0,08	*49,3*	4,3	0,2
Ratatouille	34,31	0,83	1,76	14,88	13,46	0,37	0,00	100,00	0,00	0,30	*15,3*	1,5	0,7
Tomatoes, grilled with garlic breadcrumbs	67,68	1,16	0,92	10,10	20,49	0,79	0,08	300,00	0,03	3,21	*6,9*	8,1	4,8
Almond, unsalted	575,50	19,00	10,70	0,00	250,00	4,20	0,00	6,00	0,00	4,20	*4,6*	6,4	0,1
Peanut, unsalted	590,10	25,30	6,80	0,00	60,00	2,40	0,00	9,00	0,00	8,50	*3,1*	13,0	0,1
Hazelnut, unsalted	646,00	13,00	7,30	1,00	188,00	3,70	0,00	3,00	0,00	4,60	*3,1*	7,0	0,1
Walnut	674,20	14,50	4,91	3,00	93,00	2,50	0,00	7,00	0,00	5,20	*2,2*	8,0	0,1
Brazil nut	660,00	13,00	7,10	0,00	178,00	3,10	0,00	2,00	0,00	16,10	*2,8*	24,4	0,1

MIXED DISHES - SANDWICHES														
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Spaghetti with tomato sauce	101,22	3,31	1,73	3,36	11,21	0,67	0,00	189,48	0,25	0,35	*4,3*	2,7	1,0
Creamed potatoes, Dauphiné-style	166,78	3,87	1,01	4,72	92,68	0,30	0,11	429,35	0,00	7,71	*3,2*	16,2	6,8
Pasta au gratin	159,65	5,31	1,62	0,00	77,36	0,59	0,05	401,74	0,00	2,95	3,6	8,7	6,4
Crab mousse	186,17	11,05	0,01	0,00	38,04	0,81	0,09	580,22	0,00	9,20	3,2	20,1	9,2
Vegetable terrine or mousse	83,30	4,67	2,55	19,22	50,79	1,04	0,31	335,49	0,00	2,06	11,9	6,7	4,7
Celeriac in rémoulade sauce	302,99	1,60	1,17	6,33	33,62	0,69	0,16	211,56	0,00	4,61	1,5	9,2	3,4
Salad, tuna and vegetables, canned	146,98	9,15	2,99	8,45	19,60	1,16	0,83	234,59	0,00	1,24	8,1	4,4	2,8
Mushrooms, marinated	72,84	1,73	1,97	8,56	19,53	0,60	0,00	500,00	0,04	0,94	*6,9*	6,7	2,2
Tabouleh	124,29	2,25	1,30	20,09	12,98	0,50	0,00	390,00	0,00	1,12	*5,2*	5,8	2,5
Guacamole	108,69	1,53	3,95	12,35	15,48	0,81	0,00	250,00	0,00	2,04	*6,9*	5,7	4,0
Sauerkraut, with meat, canned	157,59	5,53	1,33	7,14	18,80	0,63	0,02	544,20	0,24	4,84	*3,5*	13,2	8,9
Pot-au-feu	92,52	8,64	1,78	5,05	21,58	1,21	0,00	418,41	0,00	1,64	*8,0*	6,9	3,7
Couscous with meat	140,11	7,80	1,17	3,08	13,61	0,76	0,04	486,39	0,03	2,78	*3,9*	9,4	6,3
Paella	126,69	10,09	0,90	5,28	22,75	1,14	0,04	290,00	0,11	1,02	*5,6*	4,7	2,4
Stew of sausages with cabbage and root vegetables	100,17	7,51	2,02	9,89	20,46	0,51	0,00	385,00	0,03	2,08	*7,0*	7,2	4,8
Stuffed tomatoes	102,56	4,68	0,95	4,67	26,46	0,93	0,09	447,23	0,13	2,38	*5,0*	8,4	5,5
Witlof and ham au gratin	89,76	8,67	0,67	6,09	149,82	0,46	0,12	385,87	0,10	2,83	*9,3*	8,4	6,2
Stuffed vegetable (excluding tomato)	80,60	2,97	0,84	4,96	22,91	0,51	0,08	495,84	0,03	2,21	*4,7*	8,6	5,1
Moussaka	133,94	8,51	1,88	2,21	78,58	1,21	0,02	500,00	0,00	3,49	*6,1*	10,6	7,9
Cassoulet, canned	168,13	6,47	2,87	2,03	36,33	1,49	0,03	404,00	0,04	4,08	*4,7*	10,5	6,4
Shepherd's pie	154,45	5,01	0,97	4,39	26,98	0,47	0,11	407,30	0,01	5,97	*2,9*	13,4	6,5
Ravioli with meat and tomato sauce, canned	145,67	9,39	1,11	3,36	12,69	1,40	0,00	502,69	0,25	2,75	*4,7*	9,6	6,5
Cannelloni, meat	148,55	8,80	1,32	0,14	8,70	1,18	0,00	486,76	0,00	2,22	*4,0*	8,5	5,0
Lasagne	130,30	6,10	1,64	0,00	89,50	1,08	0,03	430,00	0,00	2,40	5,4	8,2	5,5
Chili con carne	120,18	7,73	3,87	2,69	30,96	1,65	0,00	464,52	0,00	2,23	*7,7*	8,3	5,1
Meat, poultry or fish fritter, home made	220,38	15,74	0,59	0,00	19,66	1,04	0,26	115,96	0,00	1,78	3,8	3,9	1,8
Quenelle, in sauce, canned	180,16	8,39	0,41	0,00	23,04	0,84	0,58	461,49	0,00	6,58	3,9	14,8	7,3
Shrimp fritter	203,18	12,70	0,59	0,00	58,86	1,84	0,26	728,76	0,00	1,58	4,8	10,1	3,6
Puff pastry with cheese	426,91	9,47	0,89	0,18	267,28	1,19	0,55	694,30	0,00	18,87	3,2	35,9	11,0
Puff pastry with meat	421,75	9,58	0,88	1,82	63,67	1,45	0,52	848,00	0,00	17,54	2,2	35,5	13,4
Croissant with ham, from bakery	254,77	12,38	1,23	4,10	117,93	0,96	0,20	683,91	3,37	3,90	3,8	15,4	12,2
Summer roll	58,77	5,84	0,60	1,13	40,43	0,95	0,00	250,00	0,00	0,21	*8,3*	3,0	0,5

MIXED DISHES - SANDWICHES														
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Egg roll or nem	211,40	11,31	1,02	0,99	13,54	0,79	0,11	494,20	0,52	3,51	3,0	10,9	8,4
Crepe, buckwheat, stuffed	217,92	13,77	1,63	1,71	224,40	1,10	0,74	444,44	0,05	5,34	7,0	12,8	7,1
Cheese in puff pastry	429,70	9,53	0,90	0,18	268,85	1,20	0,56	445,06	0,00	18,99	3,2	33,5	7,1
Fish in puff pastry	355,03	8,07	1,00	0,38	66,16	1,01	1,61	500,00	0,00	15,20	3,6	28,3	7,9
Cod fritter	241,67	14,04	1,17	1,52	27,24	1,16	0,13	400,00	0,02	2,19	3,4	7,6	5,0
Crepe, stuffed	167,43	10,45	0,41	3,33	132,37	0,69	0,28	575,00	0,11	4,04	5,4	12,3	9,2
Cheese chou-pastry puff	266,87	10,98	0,56	0,00	230,51	0,95	0,72	276,05	0,00	10,30	5,0	18,5	4,4
Chicken nuggets	303,83	19,83	0,46	0,00	14,47	1,09	0,14	430,31	0,28	3,74	3,0	10,4	7,1
Vol-au-vent (average)	225,14	8,92	0,59	0,53	72,81	0,79	0,23	370,39	0,00	8,54	3,1	16,9	5,9
Grilled cheese and ham sandwich	245,87	11,81	1,47	3,07	174,58	0,90	0,12	707,00	0,76	3,61	4,3	13,5	9,0
Hot Dog with mustard	283,26	10,15	1,98	0,16	20,14	1,26	0,00	705,20	0,00	3,70	2,5	13,1	8,4
Quiche Lorraine	309,67	8,73	0,57	0,20	157,69	1,00	0,41	410,46	0,06	11,86	3,2	22,3	6,6
Hamburger	269,78	12,71	1,86	0,22	54,39	1,56	0,00	500,00	0,82	4,68	3,4	12,9	8,7
Cheeseburger	281,74	15,83	1,55	0,00	173,50	1,59	0,05	400,00	0,71	6,66	4,5	14,8	7,1
Vegetable quiche	225,18	5,89	1,38	3,60	96,50	1,08	0,38	506,17	0,75	8,53	3,7	18,8	8,8
Flamenkueche (Alsacian “pizza” with bacon and cream)	242,39	6,61	1,34	0,55	43,28	0,79	0,10	493,00	0,05	7,25	2,4	16,2	7,9
Leek pie	180,36	4,02	1,99	3,15	32,45	0,69	0,32	407,07	0,00	6,78	3,3	14,6	6,5
Pizza (average)	221,02	9,48	1,63	4,63	153,10	1,13	0,19	500,00	0,29	3,53	4,6	10,8	8,2
Sandwich, tuna and vegetables	171,57	8,57	1,65	9,17	46,09	1,05	1,04	988,39	0,49	1,29	6,7	12,7	3,4
Sandwich on French bread, vegetables & mayonnaise	154,00	4,79	2,22	4,90	22,30	0,92	0,00	363,55	0,00	0,14	4,0	4,1	0,3
Sandwich on French bread, turkey, vegetables & mayonnaise	191,11	13,18	1,86	1,78	21,20	1,20	0,00	378,33	0,00	0,39	4,3	4,6	0,9
Sandwich on French bread, ham, vegetables & mayonnaise	196,51	12,68	1,60	4,95	15,80	1,22	0,14	852,50	0,18	0,76	4,4	10,3	1,9
Sandwich on French bread, egg, vegetables & mayonnaise	178,06	8,25	1,67	2,12	33,42	1,34	0,59	352,21	0,00	1,23	5,1	5,6	2,8
Sandwich on French bread, pork, vegetables & mayonnaise	221,26	12,71	1,86	1,79	18,84	1,17	0,00	380,10	0,00	1,78	3,6	6,7	4,0
Sandwich on French bread, chicken, vegetables & mayonnaise	196,32	12,30	1,86	1,78	19,73	1,20	0,06	383,33	0,00	0,63	4,1	5,0	1,4
Sandwich on French bread, tuna, vegetables & mayonnaise	167,98	12,82	1,67	2,12	18,07	1,27	1,15	450,58	0,00	0,32	7,3	5,2	0,7
Sandwich on French bread, cheese	294,16	15,79	1,60	0,00	369,28	1,00	0,14	588,80	0,00	7,12	5,6	17,0	9,3
Sandwich on French bread, ham	267,57	10,39	1,74	3,30	17,40	1,16	0,22	721,20	0,12	5,79	3,0	16,5	11,6
Sandwich on French bread, ham & cheese	242,60	14,12	1,68	2,89	202,26	1,20	0,13	701,47	0,11	3,23	5,2	12,4	7,5
Sandwich Kebab	204,38	10,13	1,61	3,91	17,67	1,31	0,00	639,83	0,02	2,09	3,7	9,9	4,8
Sandwich on French bread, sausage	249,35	10,00	1,77	9,00	25,75	1,26	0,00	944,00	1,78	3,99	3,5	17,2	10,8
Sandwich on wholemeal loaf bread (average)	172,23	13,92	4,38	2,13	40,88	1,56	0,00	406,62	0,00	0,47	6,7	5,0	1,1

MIXED DISHES - SANDWICHES													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Sandwich on loaf bread (average)	194,34	13,37	2,07	2,13	59,03	1,12	0,00	351,62	0,83	0,80	4,8	5,5	2,6
Sandwich on French bread, pâté	293,26	10,84	1,60	2,70	19,40	3,34	0,27	677,00	0,00	5,08	3,9	14,9	10,7
Sandwich on French bread, salami	371,59	13,78	1,31	0,00	19,70	1,84	0,39	1282,50	0,00	9,01	2,8	27,2	20,3
Sandwich on French bread, dry sausage	337,72	16,24	1,60	0,00	17,60	1,36	0,00	1302,50	0,00	5,93	2,6	22,8	13,5
Sandwich on French bread, smoked salmon	230,95	13,99	1,82	0,05	59,50	1,02	8,55	870,00	0,83	1,65	18,6	12,3	4,6
Grilled cheese, ham & egg sandwich	234,32	12,12	1,04	2,17	139,61	1,18	0,62	707,00	0,54	4,35	5,1	14,4	10,4

CHEESES													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Camembert cheese, 40% fidm	265,50	23,40	0,00	0,00	570,00	0,50	0,26	830,00	0,00	12,00	8,2	27,0	13,2
Camembert cheese, 45% fidm	282,80	21,20	0,00	0,00	400,00	0,20	0,30	802,00	0,00	13,80	6,0	29,4	12,7
Camembert and similar cheese, 50% fidm	314,20	20,50	0,00	0,00	388,00	0,10	0,32	806,00	0,00	16,20	5,2	33,1	12,8
Coulommiers cheese	307,90	20,50	0,00	0,00	244,00	0,80	0,30	684,00	0,00	15,80	4,6	31,2	10,8
Brie cheese	329,90	20,60	0,00	0,00	117,00	0,80	0,20	717,00	0,00	17,30	3,3	33,8	11,4
Carré de l'Est cheese	313,50	21,00	0,00	0,00	228,00	0,20	0,30	1110,00	0,00	16,00	4,2	36,0	17,6
Chaource cheese	287,20	17,80	0,00	0,00	388,00	0,10	0,30	806,00	0,00	15,10	5,4	31,4	12,8
Neufchâtel cheese	301,20	15,00	0,00	0,00	75,00	0,30	0,40	399,00	0,00	16,90	2,8	29,8	6,3
Maroilles cheese	342,60	20,40	0,00	0,00	800,00	0,40	0,20	1050,00	0,00	18,40	7,4	39,0	16,7
Munster cheese	332,90	19,10	0,00	0,00	430,00	0,40	0,20	930,00	0,00	18,10	5,1	37,3	14,7
Pont l'Évêque cheese	300,40	21,10	0,00	0,00	470,00	0,40	0,20	670,00	0,00	15,30	6,1	30,3	10,6
Reblochon cheese	318,20	19,70	0,00	0,00	625,00	0,30	0,20	840,00	0,00	16,90	6,7	34,5	13,3
Rouy cheese	332,50	23,50	0,00	0,00	500,00	0,40	0,20	484,00	0,00	16,90	5,9	30,7	7,7
Saint-Marcellin cheese	328,10	18,80	0,00	0,00	173,00	0,00	0,20	600,00	0,00	16,80	3,2	31,8	9,5
Vacherin cheese	320,60	17,60	0,00	0,00	700,00	0,40	0,20	450,00	0,00	17,70	7,0	31,6	7,1
Cottage – feta cheese	264,00	14,21	0,00	0,00	493,00	0,65	0,20	1116,00	0,00	14,95	6,5	34,4	17,7
Beaufort cheese	400,70	26,60	0,00	0,00	1040,00	0,20	0,30	448,00	0,00	19,70	8,2	34,6	7,1
Comté cheese	398,50	29,20	0,00	0,00	880,00	0,80	0,26	367,00	0,00	18,80	7,7	32,4	5,8
Parmesan cheese	391,20	35,70	0,00	0,00	1275,00	0,70	0,46	913,00	0,00	17,40	10,8	36,0	14,5
Processed cheese, 45% fidm	282,70	16,80	0,00	0,00	492,00	0,80	0,14	1139,00	0,40	13,50	6,3	32,8	18,5
Roquefort cheese	360,10	18,70	0,00	0,00	600,00	0,50	0,20	1600,00	0,00	19,90	5,7	47,1	25,4
Babybel - Bonbel type cheese	313,60	22,60	0,00	0,00	659,00	0,30	0,20	748,00	0,00	15,70	7,3	31,7	11,9

CHEESES														
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Cantal cheese	366,50	23,00	0,00	0,00	970,00	0,40	0,20	940,00	0,00	19,30	8,2	39,2	14,9
Cheddar cheese	405,50	26,00	0,00	0,00	740,00	0,40	0,26	700,00	0,00	21,30	6,4	39,7	11,1
Édam cheese	332,80	24,70	0,00	0,00	890,00	0,30	0,18	485,00	0,00	16,40	8,6	30,0	7,7
Morbier cheese	347,30	23,60	0,00	0,00	760,00	0,30	0,20	990,00	0,00	17,80	7,3	37,4	15,7
Pyrénées cheese	355,10	22,40	0,00	0,00	635,00	0,30	0,20	824,00	0,00	18,70	6,3	37,0	13,1
Raclette cheese	357,10	25,60	0,00	0,00	550,00	0,20	0,20	760,00	0,00	17,50	5,9	34,5	12,1
Saint-Nectaire cheese	341,00	22,70	0,00	0,00	590,00	0,30	0,20	590,00	0,00	17,60	6,3	32,9	9,4
Saint-Paulin cheese	297,50	23,30	0,00	0,00	780,00	0,30	0,20	610,00	0,00	14,40	8,7	28,3	9,7
Tomme cheese	321,20	21,80	0,00	0,00	403,00	0,30	0,20	808,00	0,00	16,40	5,3	33,4	12,8
Goat cheese, fresh	206,70	11,10	0,00	0,01	150,00	0,20	0,50	330,00	0,00	11,30	4,4	20,6	5,2
Goat cheese, semi-dry	334,60	18,30	0,00	0,00	102,00	1,00	0,26	570,00	0,00	18,60	3,1	34,2	9,0
Crottin goat cheese	367,10	19,90	0,00	0,00	117,00	0,60	0,30	464,00	0,00	20,60	3,0	36,1	7,4
Selles-sur-Cher goat cheese	324,80	16,90	0,00	0,00	99,00	1,00	0,20	633,00	0,00	18,30	3,0	34,4	10,0
Uncured cheese, 40% fidm, salted	191,70	15,00	0,00	0,00	85,00	0,30	0,00	610,00	0,00	8,40	*3,6*	19,2	9,7
Processed cheese	347,30	12,50	0,00	0,00	243,00	1,40	0,14	1067,00	0,00	19,10	3,5	40,2	16,9
Bleu d'Auvergne cheese	341,80	20,20	0,00	0,00	722,00	0,60	0,23	1150,00	0,00	18,80	7,1	40,6	18,2
Cheese spread, 70% fidm, with herbs	405,00	7,00	0,00	0,00	73,00	0,40	0,27	597,00	0,00	26,00	1,4	45,7	9,5
Camembert-type cheese, 75% fidm	360,80	16,40	0,00	0,00	388,00	0,10	0,32	806,00	0,00	20,70	4,2	39,9	12,8
Cheese, low-fat (20-25% fidm)	220,70	27,50	0,00	0,00	651,00	0,30	0,20	917,00	0,00	7,80	11,0	21,5	14,5
Gruyère cheese	376,80	29,40	0,00	0,00	1185,00	0,80	0,30	226,00	0,00	17,30	10,0	28,6	3,6
Processed cheese for children	327,50	7,70	0,00	0,00	102,00	1,40	0,20	650,00	0,00	18,90	2,3	35,5	10,3
Mimolette cheese	346,20	24,90	0,00	0,00	854,00	0,40	0,24	620,00	0,00	17,70	8,2	33,4	9,8
Mozzarella cheese	281,00	19,42	0,00	0,00	517,00	0,18	0,20	373,00	0,00	13,15	6,6	23,9	5,9
Processed cheese for children	150,20	16,30	0,00	0,00	554,00	0,80	0,10	1090,00	0,40	4,90	12,7	19,2	11,5
Processed cheese, with walnuts	366,20	12,50	0,20	0,00	243,00	1,40	0,23	1067,00	0,00	15,80	3,4	35,2	16,9
Ricotta cheese	281,00	19,42	0,00	0,00	517,00	0,18	0,20	373,00	0,00	13,15	6,6	23,9	5,9
Cheese spread, plain	246,00	9,00	0,00	1,00	85,00	0,30	0,24	610,00	0,00	13,50	2,6	26,9	9,7
Cheese spread, low-fat	110,40	10,50	0,00	1,00	117,00	0,40	0,08	610,00	0,00	3,58	6,3	11,9	8,1
Cheese spread, with herbs	358,80	9,80	0,00	0,00	94,00	0,30	0,20	540,00	0,00	21,80	1,8	38,7	8,6
Cheese fondu	324,43	17,92	1,48	0,10	520,50	0,99	0,14	490,38	0,03	9,26	6,3	19,2	7,8

YOGHURTS - QUARKS - MILK-BASED DESSERTS													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Yoghurt, wholemilk, Bifidus, with fruits	105,98	3,40	0,21	2,21	123,96	0,17	0,03	52,03	11,20	1,90	*4,4*	10,9	5,1
Quark, 0% fidm with fruits	46,50	4,30	0,00	0,00	161,00	0,10	0,00	45,00	3,10	0,05	*10,9*	2,6	0,8
Quark, 20% fidm with fruits	109,70	3,90	0,00	0,80	154,00	0,10	0,30	61,00	10,00	2,80	5,6	11,6	7,3
Quark, 0% fidm plain	45,70	7,50	0,00	0,00	126,00	0,40	0,00	33,00	0,00	0,05	*12,6*	0,4	0,1
Quark, 20% fidm, plain	71,00	8,30	0,00	0,00	117,00	0,40	0,00	33,00	0,00	1,70	*8,2*	2,9	0,5
Quark, 40% fidm, plain	113,60	7,00	0,00	0,00	109,00	0,30	0,00	29,00	0,00	5,10	*4,5*	8,0	0,5
Petit-Suisse-type cheese, 40% fidm	141,70	9,40	0,00	0,80	111,00	0,20	0,20	31,00	0,00	6,40	4,7	10,0	0,5
Yoghurt, plain	46,30	4,30	0,00	0,00	173,00	0,10	0,04	58,00	0,00	0,70	11,9	1,7	0,9
Yoghurt, wholemilk, plain	68,50	4,10	0,00	1,00	151,00	0,10	0,04	64,00	0,00	2,35	7,5	4,2	1,0
Yoghurt, nonfat, plain	39,40	4,50	0,00	1,00	150,00	0,09	0,01	47,00	0,00	0,10	12,9	0,6	0,2
Yoghurt, nonfat, sweetened	78,13	3,91	0,00	0,00	157,52	0,10	0,04	52,78	9,00	0,64	6,4	7,5	2,3
Yoghurt, flavoured	90,20	4,00	0,00	1,00	150,00	0,20	0,04	58,00	9,80	1,10	5,8	8,8	3,4
Yoghurt, wholemilk, flavoured	97,60	3,20	0,00	1,00	130,00	0,10	0,04	50,00	9,30	2,00	4,5	9,8	5,3
Yoghurt, nonfat, flavoured	47,40	4,30	0,00	4,00	161,00	0,10	0,04	45,00	3,00	0,10	12,5	2,6	0,9
Yoghurt, wholemilk, with fruits	100,21	3,44	0,21	2,46	125,64	0,14	0,03	52,81	9,76	1,93	*4,7*	10,0	5,2
Drinking yoghurt, flavoured	81,00	2,90	0,00	0,00	107,00	0,10	0,04	45,00	9,80	1,10	4,4	8,7	3,2
Drinking yoghurt, Bifidus	59,10	3,30	0,00	1,00	150,00	0,13	0,03	46,00	0,00	2,20	8,2	3,8	0,7
Quark, plain, with cream	129,79	6,74	0,00	0,00	98,94	0,35	0,05	31,45	2,68	5,58	3,9	10,6	3,2
Milk-shake	109,10	3,20	0,00	1,00	132,00	0,20	0,01	76,00	13,10	1,60	4,1	12,0	4,8
Buttermilk, cultured	81,00	2,90	0,00	0,00	107,00	0,10	0,04	45,00	9,80	1,10	4,4	8,7	3,2
Quark, bifidus, flavoured	168,00	6,60	0,00	1,00	75,00	0,30	0,20	22,00	13,70	5,10	3,1	17,1	11,9
Petit-suisse-type cheese, fruit flavour	126,30	6,60	0,00	0,80	115,00	0,40	0,20	35,00	10,60	3,00	4,9	12,0	7,4
Petit-Suisse-type cheese with fruits	165,12	7,90	0,12	2,24	93,68	0,20	0,17	25,99	11,00	5,35	3,6	15,7	11,4
Yoghurt, bifidus, flavoured	90,20	4,00	0,00	1,00	150,00	0,20	0,04	58,00	9,80	1,10	5,8	8,8	3,4
Yoghurt, with cereals	110,37	3,49	0,35	0,95	127,00	0,40	0,04	67,50	10,09	1,94	*4,5*	10,4	5,5
Yoghurt, with fruits	87,07	3,55	0,20	1,62	141,42	0,14	0,03	47,11	11,20	0,57	*5,6*	8,8	2,0
Soy yoghurt*	45,10	3,00	0,00	0,00	68,00	0,70	0,00	19,00	4,00	0,27	*7,9*	3,3	0,9
Custard dessert, chocolate	129,30	4,20	0,00	1,00	150,00	0,50	0,35	65,00	8,90	1,90	5,4	9,5	5,3
Custard, English cream	123,60	5,50	0,00	0,50	130,00	0,40	0,25	78,00	6,38	3,10	5,1	9,8	7,6
Custard with caramel sauce	126,85	4,31	0,07	0,72	83,72	0,39	0,27	51,01	16,34	1,13	4,0	13,1	3,4
Custard tart or flan	126,36	5,19	0,22	0,40	89,63	0,40	0,30	54,03	10,97	1,97	4,4	10,9	5,3
Rice or semolina pudding	153,75	3,36	0,27	0,74	79,09	0,19	0,02	35,59	13,51	1,14	*2,2*	11,1	3,2

YOGHURTS - QUARKS - MILK-BASED DESSERTS													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Custard, floating island	159,13	5,13	0,00	0,45	57,31	0,43	0,30	63,84	26,53	1,01	3,0	19,9	3,3
Chocolate or coffee custard, topped with wiped cream	218,51	3,18	1,81	0,35	87,13	0,77	0,03	33,18	19,60	7,47	2,6	24,7	17,5

*For convenience, soy-based products are grouped with dairy products which they can substitute

PASTRY – BISCUITS													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Chips, salted (potatoes)	515,60	5,50	4,18	10,00	37,00	2,00	0,00	600,00	0,00	7,50	*2,1*	17,7	9,5
Taramasalata	593,38	5,00	0,16	0,00	14,48	0,34	0,69	1119,31	0,10	7,31	0,9	23,0	16,7
Gherkin, pickle	12,10	0,70	0,80	5,00	14,00	1,00	0,00	700,00	0,00	0,00	*30,4*	7,4	0,1
Olive, ripe, in brine	294,00	2,00	2,60	0,00	61,00	1,50	0,00	3288,00	0,00	4,20	*2,2*	41,1	9,5
Olive, green, in brine	117,70	1,30	2,30	0,00	36,00	1,20	0,00	1609,00	0,00	1,80	*4,2*	19,7	4,1
Nut and raisin mix, snack	405,06	6,86	4,61	8,71	63,95	2,23	0,00	44,70	17,86	7,40	*3,1*	23,6	17,5
Peanut, roasted, salted	597,30	26,80	7,60	0,00	62,00	2,50	0,00	430,00	0,00	8,50	*3,3*	17,4	6,8
Pistachio nut, roasted, salted	599,40	18,00	10,10	7,00	135,00	7,00	0,00	650,00	0,00	6,70	*4,9*	17,0	10,3
Sunflower seed, kernel	597,00	22,30	8,76	0,01	100,00	6,40	0,00	430,00	0,00	5,30	*4,4*	12,6	6,8
Cashew nut, roasted, salted	597,40	18,60	5,50	0,00	38,00	5,20	0,00	346,00	0,00	9,70	*3,2*	18,4	5,5
Lumpfish eggs	116,80	13,00	0,00	0,00	35,00	0,80	2,00	2070,00	0,00	1,00	12,0	23,4	2,3
Cocktail biscuit, sweetcorn-based, extruded	477,70	9,00	6,80	0,00	10,00	2,80	0,00	884,00	0,00	5,80	*2,7*	18,1	13,2
Cocktail biscuit, salted	496,50	11,80	2,57	0,00	236,00	1,10	0,15	821,00	6,90	15,60	2,7	36,9	19,9
Canapés (toast with various topping)	361,96	11,32	1,49	0,01	125,16	1,12	2,71	742,59	0,48	10,83	5,5	24,6	12,3
Gingerbread	272,85	5,20	1,75	1,22	40,63	1,21	0,00	207,43	0,00	0,38	*2,2*	2,8	0,9
Biscuit (cookie)	430,90	8,20	1,80	0,01	32,00	1,10	0,10	312,00	20,50	6,00	1,6	26,1	18,6
Biscuit (cookie), chocolate	485,20	6,90	2,70	0,00	66,00	2,10	0,00	360,00	34,30	7,60	*1,9*	38,2	23,0
Biscuit (cookie), shortbread	480,00	7,00	1,80	0,00	60,00	1,80	0,50	410,00	25,00	11,20	2,0	38,0	31,5
Biscuit (cookie), sponge fingers or Lady fingers	306,56	7,19	1,07	0,00	20,79	0,96	0,46	164,92	34,50	0,92	2,3	26,1	4,7
Madeleine biscuit	423,34	5,67	0,83	0,00	18,18	0,81	0,51	109,60	27,39	8,83	1,5	32,8	21,8
Sponge cake with orange filling, sugar iced	364,67	4,64	0,92	1,80	16,34	0,69	0,41	87,92	25,74	7,06	1,4	28,8	17,4
Biscuit (cookie), with fruit filling	364,67	4,64	0,92	1,80	16,34	0,69	0,41	87,92	25,74	7,06	1,4	28,8	17,4
Biscuit (cookie), other type	400,34	7,08	2,35	0,81	33,60	1,36	0,08	254,20	16,40	4,83	1,8	20,9	15,0
Biscuit (cookie), flaky pastry	464,24	6,30	1,87	0,00	78,18	1,21	0,31	234,75	31,58	14,68	1,8	45,8	35,3
Biscuit (cookie), wafer, with fruit filling	437,78	9,08	2,26	0,13	55,11	1,96	0,74	69,14	15,21	3,96	2,7	16,9	10,1

PASTRY – BISCUITS													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Biscuit (cookie), boat-shaped, jam-filled	364,67	4,64	0,92	1,80	16,34	0,69	0,41	87,92	25,74	7,06	1,4	28,8	17,4
Biscuit (cookie), with fruit filing, topped with chocolate	364,67	4,64	0,92	1,80	16,34	0,69	0,41	87,92	25,74	7,06	1,4	28,8	17,4
Madeleine biscuit, jam-filled	364,67	4,64	0,92	1,80	16,34	0,69	0,41	87,92	25,74	7,06	1,4	28,8	17,4
Pound cake	407,56	5,81	0,70	0,00	21,76	0,82	0,75	45,10	24,99	13,91	1,8	38,2	25,7
Crepe, sweetened, filled or plain	182,18	6,26	0,69	0,54	70,26	0,67	0,36	123,52	3,93	3,22	3,6	8,8	5,9
Chestnut cream, canned	255,00	2,00	3,00	0,00	13,00	1,60	0,00	4,00	26,90	0,10	2,3	18,1	0,3
Wiped cream	306,16	2,05	0,00	0,00	44,75	0,19	0,18	26,79	10,71	17,23	0,9	33,5	11,1
Macaroon	290,03	4,82	1,49	4,00	48,08	0,98	0,49	100,59	16,70	7,82	2,5	24,0	18,3
Brownie, chocolate-nut	405,00	4,80	2,10	0,00	29,00	2,25	0,50	312,00	36,00	4,24	2,3	33,7	14,6
Sponge cake	266,97	7,50	0,77	0,00	31,40	1,12	0,95	84,41	27,41	3,40	3,5	24,3	9,1
Pastry cream puff, eclair, religieuse	209,01	4,98	1,34	0,53	59,05	1,10	0,47	121,31	21,29	3,63	3,6	21,0	10,2
Fruit pie or tart	219,40	3,22	1,70	8,73	53,59	0,81	0,26	115,10	9,43	5,52	3,0	15,9	11,3
Cheesecake	201,64	6,99	0,21	0,00	76,54	0,58	0,35	233,88	10,00	6,72	3,1	19,3	13,7
Doughnut	374,40	6,60	1,40	0,00	35,00	1,60	0,80	230,00	14,30	6,00	2,6	21,1	17,3
Fruit cake	352,30	5,96	1,83	0,96	27,98	1,35	0,56	60,41	15,01	8,62	2,4	23,7	16,0
Mille-feuille pastry	310,16	4,76	0,62	0,43	84,06	0,96	0,49	179,58	15,89	9,40	2,4	26,7	18,7
Sherbet	134,78	0,30	0,89	18,67	10,35	0,27	0,00	2,13	28,66	0,01	3,6	19,1	0,1
Ice cream	174,41	3,68	0,60	1,45	91,14	0,61	0,22	40,45	15,73	4,10	3,1	17,1	10,0
Ice cream on stick, chocolate covered	245,85	4,38	2,06	1,19	96,94	1,11	0,19	40,41	18,95	7,50	3,1	24,4	17,7
multi layer pound cake, chocolate filling	459,70	5,60	2,90	0,00	145,00	1,30	0,10	158,00	59,04	9,40	2,1	55,3	23,9
Rum baba	215,58	2,78	0,81	0,33	14,39	0,57	0,23	122,66	18,70	3,93	1,7	19,7	10,9
Fruit charlotte	218,73	1,95	0,94	17,73	22,12	0,30	0,09	31,72	28,52	5,06	2,5	27,0	12,0
Crumble	446,68	6,03	1,29	0,00	21,63	1,04	0,64	85,53	23,03	12,85	1,7	35,7	24,4
Sponge cake with cream	222,94	5,25	0,39	0,27	52,15	0,76	0,50	208,22	19,06	4,49	2,8	21,7	13,5
Corne de gazelle oriental pastry	449,79	10,31	4,78	0,21	99,47	2,02	0,10	89,93	10,42	5,93	2,9	16,9	11,8
Almond pie	378,87	7,07	1,69	0,00	75,55	1,39	0,52	157,29	27,55	8,15	2,5	32,4	21,0
Fruit batter pudding	181,20	5,65	1,12	0,60	64,94	0,83	0,27	45,94	10,68	1,39	3,6	9,7	3,9
Custard, crème brûlée	151,18	4,72	0,20	0,37	81,59	0,37	0,28	49,13	19,05	1,79	3,4	15,9	4,8
Chocolate mousse	309,02	7,58	2,94	0,00	38,15	1,81	0,55	70,46	33,32	7,95	3,4	35,0	19,2
Fruit mousse	156,34	6,25	0,32	15,72	31,72	0,98	0,92	65,52	0,99	5,72	6,9	10,0	2,0
Baked Alaska	245,30	5,81	0,74	0,47	39,23	0,85	0,44	53,23	27,71	2,48	2,6	22,8	6,5
French toast	210,70	5,39	0,72	0,41	59,28	0,71	0,35	200,09	14,93	3,10	2,9	16,8	10,2

PASTRY – BISCUITS														
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LIM 2
Peach Melba or Belle Hélène pear dessert	144,69	1,58	0,59	3,33	40,56	0,37	0,18	13,65	27,45	0,60	2,3	19,4	1,6
Puff pastry with ice cream and chocolate sauce	308,00	5,59	1,73	0,28	58,94	1,21	0,59	132,68	17,00	11,53	2,8	30,2	19,1
Tiramisu	265,10	5,82	1,05	0,00	43,41	1,07	0,58	73,29	15,18	10,03	2,9	26,1	16,3
Jam, reduced sugar	130,00	0,50	1,28	9,00	9,00	0,20	0,00	1,20	19,15	0,00	*2,6*	12,8	0,1
Chocolate paste with hazelnut	530,20	6,80	1,20	0,00	120,00	3,60	0,00	30,00	51,50	10,30	*2,2*	50,3	23,9
Almond paste	482,49	8,93	5,03	0,00	118,03	2,01	0,00	2,82	53,00	1,97	*2,6*	38,3	4,5
Fruit syrup	252,40	0,10	0,00	9,00	7,00	0,20	0,00	0,00	50,00	0,00	*0,8*	33,3	0,1
Milk, whole, condensed, sweetened	327,90	8,40	0,00	3,00	280,00	0,20	0,10	128,00	48,88	5,70	3,1	42,6	15,0
Meringue	399,70	5,40	0,00	0,00	5,00	0,20	0,00	100,00	91,60	0,40	*0,5*	62,7	2,5
Chocolate candy bar	459,70	5,60	2,90	0,00	145,00	1,30	0,10	158,00	59,04	9,40	2,1	55,3	23,9
Sweets (candy), average	384,30	0,40	0,00	0,00	4,00	0,40	0,00	41,00	95,00	0,00	*0,2*	63,8	0,7
Chocolate, milk	544,00	7,50	3,10	0,00	200,00	1,50	0,00	90,00	46,63	18,40	*2,1*	59,9	43,2
Chocolate (average)	519,20	4,50	7,70	0,00	50,00	2,90	0,00	15,00	53,30	17,80	*2,6*	62,7	40,7
Jam or marmelade (average)	274,00	0,50	1,11	0,00	12,00	0,50	0,00	16,00	55,15	0,00	*0,8*	36,9	0,3
Honey	305,60	0,40	0,20	2,00	5,00	0,50	0,00	7,00	0,00	0,00	*0,5*	0,1	0,1
Fruit paste	217,20	1,00	1,26	0,00	4,00	0,30	0,00	1,00	48,16	0,00	*0,9*	32,1	0,1
Sugar, white	400,00	0,00	0,00	0,00	1,00	0,06	0,00	0,00	100,00	0,00	*0,0*	66,7	0,1
Sugar, brown	377,00	0,00	0,00	0,00	85,00	1,91	0,00	39,00	96,21	0,00	*1,3*	64,6	0,6
Frozen chocolate bar dessert	283,63	3,49	0,73	0,24	93,07	0,41	0,03	38,88	35,86	6,82	1,6	34,7	16,1
Chocolate, milk, with nuts and raisins	569,50	8,90	6,20	0,50	212,00	2,30	0,00	76,00	33,90	15,60	*2,8*	47,0	35,1
Chocolate, white	543,30	8,00	0,00	0,00	270,00	0,20	0,10	110,00	48,10	18,20	1,7	60,8	43,1
Croissant, ordinary or butter	404,80	7,50	2,80	0,00	42,00	1,20	0,13	492,00	7,50	3,90	2,0	16,1	15,3
Milkbread roll	361,20	10,00	3,10	0,01	52,00	1,30	0,60	600,00	1,40	5,70	3,1	15,9	10,9
Raisin bun	340,25	6,47	2,17	1,17	32,52	1,61	0,62	216,46	8,20	7,72	2,8	19,5	11,6
Bun with chocolate filling	416,90	7,30	3,50	0,00	43,00	1,40	0,12	458,00	12,10	9,60	2,1	27,5	19,4
Brioche	352,20	8,14	1,28	0,04	30,01	1,12	0,75	334,27	3,75	11,78	2,6	23,9	9,1
Puff pastry, sugar coated	318,46	6,74	0,56	0,20	35,25	0,98	0,79	247,11	21,00	9,08	2,5	30,4	24,6
Wafer	179,10	6,32	0,70	0,55	70,37	0,67	0,31	163,59	3,49	1,80	3,6	6,8	6,1
Croissant, butter	404,80	7,50	2,80	0,00	42,00	1,20	0,13	492,00	7,50	10,90	2,0	26,7	15,3
Croissant with almonds	528,64	7,41	3,12	0,00	105,43	1,77	0,35	266,96	21,74	15,04	2,1	40,1	26,0

MEAT – EGG – FISH – CRUSTACEAN - MOLLUSK

Nutrient Profiles Report

	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LMI 2
Egg, whole, raw	145,70	12,50	0,00	0,00	55,00	1,80	1,70	133,00	0,00	3,20	10,1	6,3	2,1
Egg, hard boiled	145,70	12,50	0,00	0,00	53,00	1,80	1,70	133,00	0,00	3,20	10,1	6,3	2,1
Egg, poached	146,10	12,60	0,00	0,00	55,00	1,80	1,70	210,00	0,00	3,20	10,1	7,1	3,3
Omelette, plain	172,50	14,60	0,00	0,00	63,00	2,00	1,60	245,00	0,00	4,10	9,0	8,8	3,9
Egg, fried, salted	185,30	13,40	0,00	0,00	58,00	1,90	1,90	277,00	0,00	6,00	8,7	12,0	4,4
Egg, scrambled	218,60	10,20	0,00	0,00	61,00	2,00	1,70	224,00	0,00	9,50	6,6	16,8	3,6
Great Atlantic scallop	87,10	15,60	0,00	0,00	35,00	1,20	0,00	156,00	0,00	0,30	*8,6*	2,1	0,7
Scampi, fried	171,54	15,66	0,00	1,80	61,20	1,17	0,01	162,00	0,00	1,52	4,9	4,0	2,6
Squid, fried	198,66	10,38	0,59	2,00	19,26	0,72	0,26	155,96	0,00	1,56	3,2	4,0	2,5
Crab, canned	97,60	19,70	0,00	0,01	97,00	2,00	0,01	720,00	0,00	0,30	11,7	8,1	0,7
Shrimp or prawn, boiled	100,70	21,80	0,00	0,01	115,00	3,30	0,01	224,00	0,00	0,40	14,5	3,0	0,9
Snail	81,00	16,00	0,00	15,00	170,00	3,50	0,00	63,00	0,00	0,30	*21,0*	1,1	0,7
Oyster	67,90	8,90	0,00	5,00	92,00	6,30	5,00	280,00	0,00	0,40	52,7	3,6	0,9
Mussel, boiled	116,60	20,20	0,00	0,01	101,00	7,90	0,01	386,00	0,00	0,70	18,1	5,1	1,6
Spiny lobster	90,70	17,40	0,00	2,00	68,00	1,30	0,01	180,00	0,00	0,40	10,3	2,5	0,9
Cuttlefish	89,40	16,00	0,00	5,00	16,00	0,50	0,01	163,00	0,00	0,35	7,9	2,3	0,8
Crab, boiled	98,40	20,10	0,00	0,00	30,00	1,50	0,00	370,00	0,00	0,40	*9,4*	4,5	0,9
Crustacean or mollusk, average	102,23	19,33	0,00	1,67	77,33	3,90	0,01	3,00	0,00	0,48	13,9	0,8	0,1
Anchovy fillets, canned in oil	160,00	21,70	0,00	0,00	210,00	2,80	14,00	4000,00	0,00	2,50	44,9	46,1	5,7
Herring, pickled or rollmops	238,00	16,00	0,00	0,00	53,00	1,20	12,00	870,00	0,00	2,38	23,5	12,8	5,4
Herring, fried	233,00	23,00	0,00	0,00	35,00	1,00	15,00	100,00	0,00	2,62	29,8	5,0	1,6
Herring, grilled	203,00	17,90	0,00	0,50	41,00	1,10	20,00	78,00	0,00	4,80	43,5	8,1	1,2
Mackerel, oven cooked	183,80	16,70	0,00	0,40	17,00	1,30	7,50	90,00	0,00	4,00	20,5	7,0	1,4
Mackerel, fried	255,33	15,03	0,00	0,36	15,30	1,17	6,75	81,00	0,00	4,76	13,3	8,1	1,3
Dogfish, cooked	135,00	18,00	0,00	0,01	20,00	0,90	0,01	100,00	0,00	1,70	5,5	3,6	1,6
Sardine in oil, canned	215,30	23,00	0,00	0,01	400,00	2,50	6,00	480,00	0,00	2,80	20,4	9,3	6,4
Sardine in tomato sauce, canned	202,79	21,06	0,39	4,21	364,10	2,43	5,40	532,00	0,00	2,54	20,1	9,5	5,8
Salmon, raw	169,70	19,70	0,00	0,00	19,00	0,70	18,00	49,00	0,00	1,90	46,9	3,4	0,8
Salmon, smoked	184,20	21,30	0,00	0,10	21,00	0,80	19,00	1200,00	0,00	2,50	45,8	16,5	5,7
Salmon, steamed	179,50	20,80	0,00	1,00	20,00	0,70	12,50	52,00	0,00	2,00	32,4	3,6	0,8
Tuna, oven cooked	176,30	29,90	0,00	0,01	35,00	1,30	4,65	50,00	0,00	1,60	17,4	3,0	0,8
Sardine, raw	162,60	20,40	0,00	0,01	85,00	1,40	11,00	110,00	0,00	2,60	33,5	5,1	1,7
Swordfish	155,00	25,39	0,00	1,10	6,00	1,04	4,00	115,00	0,00	1,41	16,7	3,3	1,8

MEAT – EGG – FISH – CRUSTACEAN - MOLLUSK													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LMI 2
Mackerel, in tomato sauce, canned	210,21	14,56	0,39	4,54	18,55	1,29	6,38	176,50	0,00	4,00	15,8	7,9	2,8
Mackerel, in white wine sauce, canned	208,00	16,00	0,00	0,01	20,00	2,20	4,65	250,00	0,00	4,20	13,2	9,0	4,0
Eel, oven cooked	229,80	23,70	0,00	0,00	25,00	0,60	5,00	65,00	0,00	3,60	12,5	6,1	1,0
Brook trout, oven cooked	125,40	22,80	0,00	0,01	12,00	1,20	0,01	70,00	0,00	0,80	7,4	2,0	1,1
Salmon carpaccio	192,13	17,62	0,22	6,74	22,93	0,80	15,96	400,00	0,00	2,33	37,6	7,8	5,3
Skate, fried	155,61	14,40	0,00	0,00	34,20	0,45	0,00	108,00	0,00	1,39	3,8	3,2	1,7
Fish soup, canned	60,21	7,06	0,59	2,05	25,06	0,49	1,76	446,03	0,00	0,62	18,3	5,7	1,4
Plaice, fried	174,51	17,10	0,00	0,00	31,50	0,54	0,01	90,00	0,00	1,61	3,9	3,4	1,4
Plaice, steamed	94,00	19,00	0,00	0,00	35,00	0,60	0,01	100,00	0,00	0,50	8,1	1,8	1,1
Alaskan pollock	78,40	16,90	0,00	0,01	20,00	0,30	0,01	113,00	0,00	0,40	7,9	1,8	0,9
Halibut	111,20	19,70	0,00	0,01	24,00	0,60	5,00	67,00	0,00	0,80	24,8	1,9	1,1
Herring, smoked	210,00	22,20	0,00	0,00	67,00	1,20	8,30	550,00	0,00	2,79	20,7	10,0	6,3
Atlantic pollock	89,00	20,00	0,00	0,00	20,00	0,60	0,01	92,00	0,00	0,20	8,5	1,3	0,5
Lemon-sole, breaded, fried	103,01	13,50	0,40	0,01	21,01	0,38	0,01	140,00	0,24	0,46	5,4	2,3	1,3
Lemon-sole, steamed	91,00	20,50	0,00	0,01	20,00	0,50	0,01	120,00	0,00	0,15	8,3	1,5	0,3
Anglerfish	77,90	17,90	0,00	0,00	42,00	0,30	0,50	100,00	0,00	0,15	11,5	1,3	0,3
Whiting, fried	172,80	18,90	0,00	0,00	36,00	0,90	0,01	81,00	0,00	1,34	4,7	2,9	1,3
Whiting, steamed	92,10	21,00	0,00	0,00	40,00	1,00	0,01	90,00	0,00	0,20	9,8	1,3	0,5
Cod, salted, poached	138,10	32,50	0,00	0,00	20,00	1,80	0,01	400,00	0,00	0,20	9,7	4,5	0,5
Fish nuggets, fried	270,89	12,42	1,00	0,01	21,46	0,57	0,01	400,00	0,40	2,97	2,2	9,0	6,7
Fish (average), fried	103,01	13,50	0,40	0,01	21,01	0,38	0,01	140,00	0,24	0,46	5,4	2,3	1,3
Skate, oven cooked	73,00	16,00	0,00	0,00	38,00	0,50	0,00	120,00	0,00	0,25	9,0	1,6	0,6
Tuna, canned in brine	116,80	25,60	0,00	0,01	9,00	1,60	3,30	415,00	0,00	0,60	20,4	5,3	1,4
Turbot	95,10	16,80	0,00	0,01	28,00	0,40	0,01	100,00	0,00	0,80	6,8	2,3	1,6
Hake	78,40	16,90	0,00	0,01	20,00	0,30	0,01	113,00	0,00	0,40	7,9	1,8	0,9
Surimi	83,80	12,60	0,00	0,01	13,00	0,30	0,01	700,00	0,00	0,20	5,6	7,7	0,5
Fish in sauce, frozen	110,70	20,74	0,04	0,55	20,11	0,46	0,07	239,08	0,00	1,48	7,2	4,8	3,4
Dab	69,80	15,20	0,00	0,01	24,00	0,70	0,01	80,00	0,00	0,15	9,1	1,1	0,3
Sole, cooked in oven	69,80	15,20	0,00	0,01	24,00	0,70	0,01	80,00	0,00	0,15	9,1	1,1	0,3
Rockfish	89,20	18,70	0,00	0,01	9,00	0,40	0,00	60,00	0,00	0,45	7,4	1,3	1,0
Tuna, canned in oil	179,38	23,55	0,00	0,01	8,28	1,47	3,04	381,80	0,00	1,60	12,2	6,5	3,6
Sea bass	111,10	19,00	0,00	0,01	134,00	2,30	0,01	71,00	0,00	0,63	11,3	1,7	1,1

MEAT – EGG – FISH – CRUSTACEAN - MOLLUSK													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LMI 2
Monkfish, grilled	93,40	22,00	0,00	0,01	12,00	0,50	0,01	88,00	0,00	0,10	8,4	1,1	0,2
Pike, oven cooked	94,10	21,50	0,00	0,00	46,00	0,90	0,01	56,00	0,00	0,20	9,7	0,9	0,5
Carp, oven cooked	135,60	20,40	0,00	0,00	40,00	1,30	0,01	55,00	0,00	1,20	6,8	2,4	0,9
Perch, oven cooked	95,40	21,60	0,00	0,00	60,00	1,10	0,01	73,00	0,00	0,25	10,3	1,2	0,6
Atlantic cod	97,40	22,10	0,00	0,00	18,00	0,40	0,01	210,00	0,00	0,25	8,1	2,6	0,6
Fish kebab	94,73	8,40	1,11	14,51	19,63	0,55	1,84	467,98	0,00	0,83	15,1	6,2	1,9
Kidney, lamb, braised	92,60	16,40	0,00	14,00	8,00	5,00	0,00	100,00s		0,80	17,0	2,3	1,6
Tripes	105,80	16,10	0,00	3,00	11,00	0,80	0,00	72,00	0,00	2,60	6,6	4,7	1,1
Brain, pork, braised	160,90	12,10	0,00	14,00	9,00	1,80	0,01	90,00	0,00	4,50	5,8	7,8	1,4
Brain, calf, boiled	160,50	12,00	0,00	15,00	14,00	2,50	0,00	153,00	0,00	4,50	6,7	8,4	2,4
Heart, beef, cooked	162,90	27,90	0,00	2,00	6,00	7,30	1,00	100,00	0,00	2,50	15,2	4,8	1,6
Liver, lamb, cooked	162,40	24,60	0,00	14,00	10,00	14,00	1,30	84,00	0,00	2,30	23,4	4,4	1,3
Liver, beef, cooked	151,90	23,60	0,00	20,00	7,00	7,70	1,20	102,00	0,00	1,80	18,5	3,8	1,6
Liver, calf, cooked	159,20	22,30	0,00	23,00	10,00	6,00	0,30	92,00	0,00	2,50	13,9	4,8	1,5
Liver, chicken, cooked	169,20	25,10	0,00	15,00	14,00	10,40	0,21	95,00	0,00	2,50	16,7	4,8	1,5
Tongue, beef, boiled	257,90	24,20	0,00	0,01	16,00	2,90	0,01	60,00	0,00	7,70	4,8	12,3	1,0
Tongue, calf, boiled	135,10	17,80	0,00	5,00	8,00	2,60	0,00	80,00	0,00	2,80	7,9	5,1	1,3
Sweetbread (thymus), calf, braised	165,10	31,60	0,00	58,00	3,00	2,00	0,00	66,00	0,00	1,50	14,3	3,0	1,0
Kidney, veal, braised	164,60	25,40	0,00	10,00	15,00	9,00	0,00	100,00	0,00	2,60	14,8	5,0	1,6
Rillettes	435,50	14,50	0,00	0,00	8,00	1,00	0,00	454,00	0,00	15,96	1,4	29,0	7,2
Pâté , country style	327,80	14,30	0,00	6,00	15,00	5,70	0,60	710,00	0,00	11,00	5,3	24,2	11,3
Pâté, pork liver	374,00	10,00	0,00	1,00	38,00	3,50	0,60	660,00	0,00	14,00	3,2	28,2	10,5
Pâté , poultry liver	201,00	13,45	0,00	10,00	10,00	9,19	0,10	386,00	0,00	4,00	10,6	10,1	6,1
Foie gras	448,00	10,00	0,00	7,00	10,00	6,40	0,20	740,00	0,00	12,00	3,5	26,0	11,7
Galantine	246,80	16,20	0,00	0,00	14,00	2,30	0,50	660,00	0,00	7,60	4,4	18,5	10,5
Pâté in crust	412,82	11,12	0,66	3,60	49,00	4,08	0,57	616,00	0,00	15,12	3,4	29,4	9,8
Head-cheese (brawn)	205,40	19,40	0,00	0,00	21,00	1,10	0,50	929,00	0,00	4,90	5,0	17,2	11,1
Andouillette chitterling sausage	234,40	18,00	0,00	0,00	20,00	1,60	0,01	630,00	0,00	6,60	3,7	16,7	10,0
Black pudding (blood sausage)	323,60	11,00	0,00	0,00	40,00	18,00	0,01	700,00	0,00	11,40	10,2	24,7	11,1
White sausage (white pudding)	240,00	10,00	0,00	0,00	51,36	1,90	0,00	702,73	0,00	7,80	3,0	19,2	11,1
Fat, pork, raw	670,00	10,00	0,00	0,00	5,00	1,00	0,00	38,00	0,00	30,00	0,7	45,9	0,6
Pork rashers, smocked	291,00	16,00	0,00	0,00	8,00	1,00	0,00	1400,00	0,50	9,25	2,3	29,1	21,5

MEAT – EGG – FISH – CRUSTACEAN - MOLLUSK														
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LMI 2
Bacon, smocked, cooked	200,20	16,00	0,00	0,00	10,00	1,00	0,01	1555,00	0,30	5,55	3,4	25,0	12,9
Ham, raw	191,90	26,30	0,00	13,00	9,00	1,40	0,60	2700,00	0,30	3,20	8,0	33,6	7,6
Sausage meat	324,40	13,00	0,00	1,00	15,00	1,20	0,01	600,00	0,00	11,40	2,0	23,6	9,5
Morteau sausage	319,80	14,00	0,00	0,01	15,00	0,90	0,01	725,00	0,00	10,60	1,9	23,7	11,5
Toulouse sausage	346,40	14,00	0,00	0,01	16,00	0,90	0,20	747,00	0,00	11,70	2,0	25,6	11,8
Chipolata sausage	344,40	13,50	0,00	1,00	16,00	0,90	0,01	747,00	0,00	11,50	1,8	25,3	11,8
Merguez sausage	300,40	16,00	0,00	0,01	12,00	1,00	0,01	900,00	0,00	10,80	2,3	25,9	14,3
Dry sausage	426,60	26,30	0,00	0,00	11,00	1,30	0,01	2100,00	0,00	12,90	2,5	41,7	29,3
Rosette dry sausage	401,00	24,00	0,00	0,00	10,00	1,00	0,00	2000,00	0,00	12,30	2,3	39,8	28,0
Chorizo dry sausage	454,00	20,00	0,00	0,00	12,00	1,20	0,01	2300,00	3,50	16,00	1,8	50,9	39,9
Salami	458,80	18,50	0,00	0,00	17,00	2,20	0,70	1800,00	0,00	16,20	2,7	43,6	28,5
Garlic sausage	314,80	15,00	0,00	0,00	11,00	1,50	0,01	1100,00	0,00	10,40	2,3	27,4	17,4
French saveloy	304,40	12,00	0,00	0,00	28,00	1,50	0,50	1100,00	0,00	10,30	2,9	27,2	17,4
Strasbourg sausage	301,20	11,00	0,00	0,01	20,00	1,00	0,20	900,00	0,00	10,30	2,1	25,1	14,3
Cocktail Sausage	308,00	13,00	0,00	0,01	37,00	1,00	0,01	1000,00	0,00	10,30	2,1	26,2	15,9
Mortadella	322,60	14,00	0,00	0,00	14,00	2,30	0,01	1000,00	0,00	10,80	2,6	26,9	15,9
Pork rashers	297,00	18,00	0,00	0,00	5,00	0,60	0,60	500,00	0,00	9,20	3,0	19,2	7,9
Beef, rib steak, broiled	203,40	24,30	0,00	0,00	8,00	2,60	0,01	50,00	0,00	5,00	5,8	8,1	0,8
Beef, braised	232,00	31,00	0,00	0,00	15,00	4,00	0,01	60,00	0,00	5,00	7,0	8,2	1,0
Beef, sirloin steak, broiled	166,40	28,10	0,00	0,00	6,00	3,00	0,00	60,00	0,00	2,60	8,2	4,6	1,0
Beef, rump, steak, broiled	148,00	28,00	0,00	0,00	6,00	3,00	0,00	60,00	0,00	1,70	9,2	3,2	1,0
Roast beef, cooked	148,90	28,00	0,00	0,00	5,00	3,50	0,01	65,00	0,00	1,70	9,6	3,3	1,0
Beef, for bourguignon, braised	231,00	29,40	0,00	0,00	17,00	3,50	0,01	52,00	0,00	5,30	6,5	8,6	0,8
Beef, stewing steak, cooked	240,00	28,50	0,00	0,00	17,00	3,40	0,01	52,00	0,00	5,90	6,1	9,5	0,8
Beef, ground, 5% fat, cooked	159,60	25,50	0,00	0,00	8,00	2,90	0,01	74,00	0,00	2,70	8,0	4,9	1,2
Beef, ground, 5% fat, cooked	212,00	24,20	0,00	0,00	9,00	2,70	0,01	78,00	0,00	5,40	5,7	9,0	1,2
Beef, ground, 15% fat, cooked	251,20	22,30	0,00	0,00	11,00	2,80	0,01	75,00	0,00	7,50	4,6	12,2	1,2
Beef, ground, 20% fat, cooked	309,00	21,00	0,00	0,00	9,00	2,20	0,01	82,00	0,00	10,50	3,3	16,8	1,3
Veal, chop	192,50	20,00	0,00	0,00	12,00	2,00	0,01	90,00	0,00	4,60	5,0	7,9	1,4
Veal, cutlet, cooked	151,00	31,00	0,00	0,00	12,00	2,00	0,01	80,00	0,00	1,10	8,6	2,5	1,3
Veal, fillet, roasted	160,40	28,40	0,00	0,00	17,00	1,30	0,01	93,00	0,00	2,20	7,0	4,3	1,5
Veal, breast	136,50	19,50	0,00	0,00	11,00	2,70	0,01	95,00	0,00	2,70	7,8	5,1	1,5

MEAT – EGG – FISH – CRUSTACEAN - MOLLUSK														
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LMI 2
Veal round, roasted	230,50	29,50	0,00	0,00	12,00	1,20	0,01	84,00	0,00	4,60	4,9	7,9	1,3
Veal, chuck	134,50	19,00	0,00	0,00	12,00	1,00	0,01	90,00	0,00	2,70	5,8	5,0	1,4
Horse meat	127,00	21,40	0,00	0,00	6,00	3,90	0,00	53,00	0,00	1,70	*10,2*	3,1	0,8
Lamb, cutlet, grilled	234,40	22,60	0,00	0,00	9,00	2,40	0,00	90,00	0,00	7,80	*4,7*	12,8	1,4
Lamb, leg, roasted	226,00	25,00	0,00	0,00	9,00	2,20	0,00	60,00	0,00	6,40	*5,0*	10,3	1,0
Lamb, shoulder, roasted	192,00	21,00	0,00	0,00	10,00	1,80	0,00	68,00	0,00	6,00	*5,0*	9,8	1,1
Veal stew in white sauce	133,96	14,25	0,77	1,16	18,68	0,79	0,06	260,00	0,00	3,18	5,2	7,6	4,1
Beef stew, Burgundy-style	145,70	14,48	0,63	0,84	18,20	1,71	0,01	400,00	0,04	3,43	*5,7*	9,5	6,4
Beef with carrots	99,09	8,32	0,64	2,33	17,25	1,22	0,00	500,00	0,12	1,54	*5,9*	7,7	3,6
Pork chop, grilled	247,00	28,00	0,00	0,01	11,00	1,10	0,01	72,00	0,00	5,80	4,3	9,5	1,1
Pork, tenderloin, lean, roasted	158,40	28,80	0,00	0,01	9,00	1,50	0,01	65,00	0,00	1,70	7,3	3,3	1,0
Pork, tenderloin, roasted	246,20	27,80	0,00	0,01	9,00	1,20	0,01	69,00	0,00	5,60	4,4	9,2	1,1
Pork, spare-ribs, roasted	389,10	29,10	0,00	0,00	9,00	1,90	0,01	90,00	0,00	11,40	3,1	18,2	1,4
Pork blade, braised	243,00	27,00	0,00	0,01	12,00	1,10	0,01	60,00	0,00	5,50	4,3	9,0	1,0
Ham, cooked	112,80	18,40	0,00	11,00	7,00	1,00	0,30	1100,00	0,40	1,40	9,4	14,0	3,6
Kebab, lamb	159,03	14,34	0,56	12,00	11,58	1,36	0,00	647,37	0,08	4,44	*6,0*	13,6	10,2
Kebab, beef	123,31	15,66	0,56	11,97	10,26	1,72	0,00	400,00	0,08	2,30	*8,5*	7,8	5,3
Kebab, mixed meat	152,24	15,82	0,56	12,00	12,79	1,36	0,00	400,00	0,08	3,59	*6,5*	9,7	6,4
Beef carpaccio	108,96	18,90	0,93	2,01	13,41	2,19	0,00	400,00	0,00	1,14	*9,8*	6,0	2,6
Burgundy fondue (with beef)	321,33	21,54	0,00	0,00	4,62	2,31	0,00	46,15	0,00	4,47	*3,2*	7,3	0,7
Lamb navarin	190,58	15,98	0,63	1,59	13,41	1,47	0,00	456,04	0,00	4,86	*4,4*	12,2	7,2
Veal paupiette	227,60	25,18	0,04	1,66	13,44	1,74	0,01	663,14	0,00	3,51	4,9	12,3	8,0
Hare, stewed	192,00	30,00	0,00	0,00	20,00	10,50	0,20	400,00	0,00	3,30	14,2	9,2	6,3
Rabbit, stewed	168,91	13,01	0,93	0,72	21,59	0,72	0,12	450,11	0,00	2,27	4,1	8,2	5,1
Chicken, roasted	161,40	26,40	0,00	0,00	12,00	1,30	0,20	80,00	0,00	1,70	7,0	3,4	1,3
Hen, meat only, stewed	228,70	30,40	0,00	0,00	13,00	1,40	0,20	78,00	0,00	3,30	5,5	5,8	1,2
Quail	161,00	20,00	0,00	0,00	15,00	4,00	0,00	55,00	0,00	2,70	*8,0*	4,7	0,9
Duck, roasted	190,00	25,00	0,00	0,00	13,00	2,70	0,00	85,00	0,00	2,70	*6,5*	5,0	1,3
Turkey, roasted	143,70	29,40	0,00	0,00	17,00	1,30	0,01	63,00	0,00	0,90	8,0	2,0	1,0
Turkey, breast, sauteed	148,40	29,90	0,00	0,00	11,00	1,40	0,00	156,00	0,00	1,00	*7,9*	3,2	2,3
Pheasant, roasted	214,60	32,50	0,00	0,00	50,00	8,50	0,00	100,00	0,00	3,10	*11,5*	5,8	1,6
Pigeon, roasted	175,00	37,00	0,00	0,00	15,00	20,00	0,20	100,00	0,00	0,70	25,4	2,1	1,6

MEAT – EGG – FISH – CRUSTACEAN - MOLLUSK													
	Energy (Kcal)	Proteins (g)	Fibres (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Vitamin D (µg)	Sodium (mg)	Added sugars (g)	Saturated fatty acids (g)	SAIN 5_{opt}	LIM 3	LMI 2
Rabbit	133,20	20,70	0,00	0,00	22,00	0,90	0,20	67,00	0,00	2,20	6,8	4,0	1,1
Kebab, poultry	129,35	14,94	0,56	11,97	12,98	0,95	0,09	400,00	0,08	2,30	7,0	7,8	5,3
Duck confit	331,19	19,51	0,02	0,00	10,70	2,12	0,00	660,60	0,00	7,67	2,9	18,6	10,5
Coq au vin	138,47	12,60	0,55	1,12	16,29	1,15	0,11	400,00	0,03	3,04	5,0	8,9	6,4
Chicken curry	145,78	20,65	0,46	15,03	20,61	1,56	0,15	300,00	0,03	1,56	8,7	5,6	3,6

Annexe 3 : Application of CAP/HAC method to food categorisation

Group 1

Apricot, canned in light syrup
Apricot, raw
Garlic
Pineapple, raw
Artichoke
Asparagus, boiled
Eggplant, boiled
Avocado
Banana, raw
Swiss chard, boiled
Beetroot
Beer, alcohol-free
Yoghurt, wholemilk, Bifidus
Yoghurt, wholemilk, Bifidus, with fruits
Beef stew with carrots
Beverage base, chocolate flavoured, sweetened (powder), reconstituted
Beverage base, malted (powder), reconstituted
Vol-au-vent (average)
White sausage (white pudding)
Fish kebab
Broccoli, boiled
Cannelloni with meat
Cardoon
Carrot, raw
Carrot, boiled
Blackcurrant, raw
Cassoulet, canned
Celeriac stalk, boiled
Celeriac, raw
Celeriac, boiled
Cherry, raw
Mushroom, marinated
Mushroom, canned
Chestnut
Endive (US chicory), raw
Chili con carne
Brussels sprout, boiled
Cabbage, red, raw
Cabbage, red, boiled
Cabbage, green
Sauerkraut, with meat, canned
Sauerkraut, without meat
Cauliflower, boiled
Chive or spring onion, raw
Lemon, raw
Clementine or mandarine orange
Palm heart, canned
Stewed fruits, low calorie, canned
Applesauce, canned
Cucumber, raw
Gherkin pickle
Courgette (zucchini), boiled
Couscous, grains, cooked
Couscous, with meat
Custard/English cream
Custard/crème brûlée
Custard with caramel sauce
Cream, light, fluid
Custard dessert, chocolate
Cream, light, thick
Crepe, stuffed, savoury
Crepe, sweetened, stuffed or not stuffed
Watercress
Salad, vegetable, without dressing
Bouillon (stock) cube
Soy yoghurt
Witlof, raw
Witlof, boiled
Spinach, boiled
Fennel
Broad bean
Fig, raw
Leek pie
Custard tart or flan
Oat porridge, made with water
Quark, flavoured
Quark, 0% fidm, with fruits
Quark, 20% fidm, with fruits
Quark, 0% fidm, plain
Quark, 20% fidm, plain
Quark, 40% fidm, plain
Strawberry, raw
Raspberry, raw
Fromage frais, reduced fat
Passion fruit
Cheesecake
Wafer
Bean, mung sprout, canned
Ice cream
Gnocchis
Creamed potatoes, Dauphiné-style
Pasta au gratin
Witlof and ham au gratin
Pomegranate, raw
Red currant, raw
Guacamole
Shepherd's pie
Haricot bean, boiled
Dwarf kidney, canned
Red kidney bean, boiled
Green bean, boiled
Mixed vegetables, canned
Pineapple juice, reconstituted
Carrot juice, pasteurised
Lemon juice, raw, unsweetened
Apricot juice
Orange juice, reconstituted
Grapefruit juice, reconstituted
Grape juice, pasteurised
Tomato juice, pasteurised
Japanese persimmon, raw
Ketchup
Kiwi fruit, raw
Milk, flavoured, UHT
Milk, semi-skimmed, dried, reconstituted
Milk, semi-skimmed, pasteurised
Milk, semi-skimmed, UHT
Milk, skimmed, dry, reconstituted
Milk, skimmed, UHT
Milk, whole, condensed
Milk, whole, raw
Milk, whole, UHT
Buttermilk
Buttermilk, plain
Cos lettuce, raw
Lasagne
Stuffed vegetable (excluding tomato)
Lentil, boiled
Lemonade
Lychee, canned
Lychee, raw
Fruit cocktail, canned in syrup
Vegetable mix, canned
Corn salad
Sweetcorn, canned
Sweetcorn on cob, boiled
Mango, raw
Melon, raw
Milk-shake
Minestrone soup
Mirabelle plum, raw
Moussaka
Fruit mousse
Mustard
Blueberry, raw
Turnip, boiled
Pear nectar
Orange nectar
Nectarine, with skin, raw
Onion, boiled
Olive, ripe, in brine
Olive, green, in brine
Orange, raw
Paella
Grapefruit, raw
Grapefruit, canned
Sandwich, tuna and vegetables
Pumpkin
Shandy (Beer + lemonade)
Watermelon, raw
Sweet potatoe
Pasta, egg, boiled
Pasta, boiled
Potato, baked
Potatoes, boiled
Dauphine potatoes, cooked
Potatoes chip (French fry), salted
Mashed potatoes
Potatoes, pan-fried
Peach, with skin, raw
Parsley, raw
Green pea, canned
Petit-Suisse cheese, 40% fidm, flavoured
Petit-Suisse cheese, with fruits
Petit-Suisse cheese, 40% fidm, plain
Dandelion leaves, raw
Pear, with skin, raw
Leek, boiled
Split pea
Chick pea
Pepper, sweet, boiled
Pepper, green, raw
Apple juice, reconstituted
Potato ball, precooked, frozen
Apple, with skin, raw
Porridge
Pot-au-feu
Stew of sausages with cabbage and root vegetables
Pumpkin
Greengage plum, raw
Quenelle, in sauce, canned
Radish
Radish, black
Grape, white, raw
Grape, red, raw
Ratatouille
Ravioli with meat and tomato sauce, canned
Rice, white, boiled
Rice, white, parboiled
Rice, wholegrain, boiled
Summer roll
Salad, tuna and vegetables, canned
Green salad, without seasoning
Salsify, boiled
Sandwich on French bread, vegetables & mayonnaise
Sandwich on French bread, egg, vegetables & mayonnaise
Sauce barbecue
Sauce béchamel
Soy sauce
Sauce Mornay
Tomato sauce with meat
Tomato sauce without meat
Salt, fine
Couscous grains, cooked
Carbonated beverage, cola
Carbonated beverage, orange
Soup, onion
Soup, vegetable, average
Soup, lentil
Soup, fish, canned
Soup, chicken noodle
Spaghetti with tomato sauce
Surimi
Tabouleh
Vegetable quiche
Vegetable terrine or mousse
Tomatoes, grilled with garlic breadcrumbs
Tomato, raw
Tomato, stuffed
Tomato, peeled, canned
Tripes
Soup, cream of mushroom
Soup, cream of tomato
Vinegar
Vol-au-vent, average
Drinking yoghurt, flavoured
Yoghurt, flavoured
Yoghurt, nonfat, flavoured
Yoghurt, wholemilk, flavoured
Yoghurt with cereals
Yoghurt, wholemilk, with fruits
Yoghurt, with fruits
Yoghurt, plain
Yoghurt, wholemilk, plain
Yoghurt, nonfat, plain
Yoghurt, sweetened

Group 2

Lamb, cutlet, grilled
Lamb, shoulder, roasted
Lamb, leg, roasted
Andouillette chitterling sausage
Bacon, smocked, cooked
Veal stew in white sauce
Beef for bourguignon, braised
Beef for pot-au-feu, braised
Beef, rump, steak, broiled
Beef stew, Burgundy-style
Beef, braised
Beef, rib steak, broiled
Beef, sirloin steak, broiled
Roast beef, cooked
Black pudding (blood sausage)
Lamb kebab
Beef kebab

Shrimp kebab
Poultry kebab
Mixed meat kebab
Quail
Duck, roasted
Beef carpaccio
French saveloy
Sausage meat
Horse meat
Chipolata sausage
Chorizo dry sausage
Duck confit
Coq au vin
Great Atlantic scallop
Turkey, breast, sautéed
Turkey, roasted
Pheasant, roasted
Foie gras
Burgundy fondue (with beef)
Head-cheese (brawn)
Galantine
Ham, raw
Ham, cooked

Scampi, fried
Rabbit, stewed
Rabbit
Pork rashers
Hare, stewed
Merguez sausage
Mortadella
Fish mousse
Lamb navarin
Chicken nugget
Pâté, country-style
Pâté, pork liver
Pâté , poultry liver
Pâté in crust
Veal paupiette
Pigeon, roasted
Pork, breast, smocked
Pork chop, grilled
Pork blade, braised
Pork, tenderloin, lean, roasted
Pork, tenderloin, roasted
Pork, spare-ribs, roasted
Hen, meat only, stewed

Chicken curry
Chicken, roasted
Rillettes
Rosette dry sausage
Salami
Sandwich on French bread, pâté
Cocktail sausage
Morteau sausage
Strasbourg sausage
Toulouse sausage
Garlic sausage
Dry sausage
Beef, ground, 5% fat, cooked
Beef, ground, 10% fat, cooked
Beef, ground, 15% fat, cooked
Beef, ground, 20% fat, cooked
Veal, chop
Veal, chuck
Veal, cutlet, cooked

Veal, fillet, roasted
Veal, breast
Veal round, roasted

Brain, pork, braised
Brain, calf, boiled
Heart, beef, cooked
Tongue, beef, boiled
Tongue, calf, boiled
Sweetbread (thymus), calf, braised
Kidney, veal, braised

Celeriac in rémoulade sauce

Margarine, reduced fat, sunflower seed
Mayonnaise, reduced fat
Sauce béarnaise
Salad dressing, oil and vinegar, reduced fat

Butter spread, reduced fat
Brie cheese

Camembert cheese, 40 % fidm
Camembert cheese, 45 % fidm
Camembert and similar cheese, 50 % fidm
Carré de l'Est cheese
Wiped cream
Chaource cheese
Cottage cheese
Coulommiers cheese
Cream, thick
Cream, fluid, sterilized
Crottin goat cheese
Feta cheese
Cheese spread
Uncured cheese, 40% fidm, salted
Goat cheese, semi dry
Goat cheese, fresh
Uncured cheese, plain
Neufchâtel cheese
Saint-Marcellin cheese

Selles-sur-Cher goat cheese

Egg, fried, salted
Egg, scrambled
Egg, hard boiled
Egg, whole, raw
Egg, poached
Omelette, plain

Sea bass
Monkfish, grilled
Pike, oven cooked
Carp, oven cooked
Plaice, steamed
Plaice, fried
Alaskan pollock
Crab, canned
Crab, boiled
Shrimp or prawn, boiled
Snail
Atlantic cod
Crustacean or mollusk, average
Spiny lobster

Atlantic pollock
Dab
Lemon-sole, steamed
Lemon-sole, breaded, fried
Anglerfish
Whiting, steamed
Whiting, fried
Hake
Cod, salted, poached
Mussel, boiled
Perch, oven cooked
Fish in sauce, frozen
Fish nuggets, fried
Skate, oven cooked
Stake, fried
Rockfish
Dogfish, cooked
Cuttlefish
Sole, cooked in oven
Brook trout, oven cooked
Turbot

Group 3

Apricot, dry
Cod fritter
Cocktail biscuit, sweetcorn-based, extruded
rum baba
Bread, French baguette
Chocolate candy ba
Frozen chocolate bar dessert
Shrimp fritter
Meat, poultry or fish fritter
Doughnut
Crisp bread/rusk, plain
Biscuit (cookie), sponge fingers or Lady fingers
Cocktail biscuit, salted
Biscuit with raisins
Biscuit, chocolate
Biscuit, jam filling
Biscuit
Biscuit, other type
Biscuit, flaky pastry
Sweets (candy), average

Brioche
Brownie, chocolate-nut
Fruit ake
Squid, fried
Fruit charlotte
Cheeseburger
Chips, salted (potatoes)
Chocolate, average
Chocolate, milk
Chocolate, milk, with nuts and raisins
Chocolate, white
Puff pastry, cream
Puff pastry, sugar coated
Fruit batter pudding
Jam, reduced suga
Jam or marmelade (average)
Chestnut cream, canned
Croissant
Croissant, butter
Croissant, ham filling

Croissant with almonds
Grilled cheese, ham & egg sandwich Grilled cheese & ham sandwich
Croquette poisson frit
Crumble
Date deied
Puff pastry, chocolate cream (éclair)
Cheese in puff pastry
Fish in puff pastry
Fig, dried
Flamenkueche (Alsacian “pizza” with bacon and cream)
Cheese fondu
Puff pastry with meatPuff pastry with cheese
Mixed grains and raisins, snack
Crepe, buckwheat, stuffed
Shortbread

Sponge cake with cream
Rice or semolina pudding
Sponge cake
Biscuit (cookie), wafer, with fruit filling
Sponge cake, topped with chocolate
Biscuit (cookie), boat-shaped, jam-filled
Ice cream on stick, chocolate covered
Cheese chou-pastry puff
Hamburger
Hot Dog with mustard
Custard, floating island
Chocolate or coffee custard, topped with wiped cream
Milk, whole, condensed, sweetened
Macaroon
Madeleine biscuit
Madeleine biscuit, jam-filled

Meringue
Honey
Mille-feuille pastry
Chocolate mousse
Nem/egg roll
Baked alaska
Bun with chocolate filling
Milkbread roll
Raisin bun
Bread, wholemeal, from bakery
Bread, country style, from bakery
Bread, sandwich loaf
Bread, rye + wheat, from bakery
Gingerbread
Bread, plain, toasted at home
French toast
Chocolate paste with hazelnut

Almond paste
Fruit paste
Pastry, chocolate (average)
Pastry, oriental
Peach Melba or Belle Hélène pear dessert
Pizza, tomato, ham, cheese
Pepper, black, ground
Puff pastry with ice cream and chocolate sauce
Prune
Pound cake
Quiche Lorraine
Raisin
Puff pastry, chocolate cream (Religieuse)
Sandwich on French bread, turkey, vegetables & mayonnaise

Sandwich on French bread, ham, vegetables & mayonnaise
Sandwich on French bread, pork, vegetables & mayonnaise
Sandwich on French bread, tuna, vegetables & mayonnaise
Sandwich on French bread, chicken, vegetables & mayonnaise
Sandwich on French bread, cheeseSandwich on French bread, ham
Sandwich on French bread, cheese and ham
Sandwich Kebab
Sandwich, merguez sausage
Sandwich on wholemeal loaf bread (average)

Sandwich on loaf bread (average)
Sandwich, salami
Sandwich, dry sausage
Fruit syrup
Sherbet
Sugar, white
Sugar, brown
Fruit pir or tart
Tiramisu
Canapés (toast with various topping)
Almond pie

Group 4

Beaufort cheese
Bleu d'Auvergne cheese
Cantal cheese
Cheddar cheese
Comté cheese
Édam cheese
Cheese, low-fat (20-25% fidm)
Processed cheese, 45% fidm
Processed cheese
Gruyère cheese
Oyster
Maroilles cheese
Mimolette cheese
Morbier cheese
Mozzarella cheese
Munster cheese
Parmesan chesse
Pont l'Évêque cheese
Pyrénées cheese
Raclette cheese
Reblochon cheese
Ricotta
Sweetbread (thymus), calf, braised
Roquefort cheese
Saint-Nectaire cheese
Saint-Paulin cheese
Tomme cheese
Vacherin cheese

Group 5

Almond
Seasoning (average)
Butter
Butter, salted
Oil, peanut
Oil, colza
Oil, walnut
Oil, sunflower seed
Oil, olive
Oil, vegetable, blended, balanced
Fat, pock, raw
Margarine, soft, sunflower seed
Mayonnaise
Walnut
Coconut
Sauce hollandaise
Salad dressing, olive oil & vinegar
Taramasalsata

Group 6

Anchovy fillets, canned in oil
Eel, oven cooked
Salmon carpaccio
Swordfish
Halibut
Herring, fried
Herring, smoked
Herring, grilled
Herring, pickled or rollmops
Mackerel, oven cooked
Mackerel, in white wine sauce, canned
Mackerel, in tomato sauce, canned
Mackerel, fried
Lumpfish eggs
Sandwich on French bread, salmon
Sardine in oil, canned
Sardine, raw
Sardine in tomato sauce, canned
Salmon, steamed
Salmon raw
Salmon, smoked
Tuna in oil, canned
Tuna, canned in brine
Tuna, oven cooked

Group 7

Breakfast cereals, puffed wheat
Breakfast cereals, chocolate filing
Breakfast cereals, sweetened (aveage)
Muesli
Breakfast cereals, corn flakes, plain, enriched
Breakfast cereals, puffed rice, enriched

Group 8

Almond, unsalted
Peanut, roasted, salted
Peanut, unsalted
Curry powder
Wheat germ, raw
Hazelnut
Cashew nut, salted
Brazil nut
Pistachio nut, roasted, salted
Sesame seed
Sunflower seed, kernel

Group 9

Liver, lamb, cooked
Liver, beef, cooked
Liver, calf, cooked
Liver, chicken, cooked

Annex 4a : SAIN formula tested

SAIN generic formula

SAIN n = (([Nut_1] / $Reco_1$ + [Nut_2] / $Reco_2$ + ... + [Nut_n] / $Reco_n$)/n) * 100) * (100 / [Energy])

n = number of qualifying nutrients
[Energy] = Energy density of the food in kcal/100 g
[Nut_i] : amount of nutrient i in 100 g of food
$Reco_i$: recommended daily intake for the nutrient i
[Nut_i] and $Reco_i$ are expressed in the same unit

SAIN 23 = (([Proteins]g / 65 + [DHA]g / 0,11 + [vit A]µg / 700 + [vit D]µg / 5 + [Zn]mg / 11 + [ALA]g / 1,8 + [LA]g / 9 + [vit B1]mg / 1,2 + [vit B2]mg / 1,6 + [vit B3]mg / 13 + [vit B6]mg / 1,7+ [vit B9]µg / 315 + [vit B12]µg / 2.4 + [vit E]mg / 12 + [K]mg / 3100 + [mg]mg / 390 + [I]µg / 150 + [Se]µg / 55 + [Cu]mg / 1,8 + [fibres]g / 25+ [vit C]mg / 110 + [Fe]mg / 12,5 + [Ca]mg / 900) / 23 * 100) * (100 / Energy)

SAIN 16 = (([Proteins]g / 65 + [DHA]g / 0,11 + [vit D]µg / 5 + [Zn]mg / 11 + [ALA]g / 1,8 + [vit B1]mg / 1,2 + [vit B2]mg / 1,6 + [vit B6]mg / 1,7 + [vit B9]µg / 315 + [E]mg / 12 + [K]mg / 3100 + [Mg]mg / 390 + [fibres]g / 25+ [vit C]mg / 110 + [Fe]mg / 12,5 + [Ca]mg / 900) / 16 * 100) * (100 / Energy)

SAIN 6 = (([Proteins]g / 65 + [fibres]g / 25+ [vit C]mg / 110 + [Fe]mg / 12,5 + [Ca]mg / 900 + [vit D]µg / 5) / 6 * 100) * (100 / Energy)

SAIN 5 generic = (([Proteins]g / 65 + [fibres]g / 25+ [vit C]mg / 110 + [Fe]mg / 12,5 + [Ca]mg / 900) / 5 * 100) * (100 / Energy)

SAIN 5 optional formula

Principle : one or more nutrient(s) in SAIN 5 generic formula is (are) replaced by one or more nutrient(s) from a defined list of optional nutrients. The nutrients substituted are those for which the ratio [nut]/Reco are lower than the ratio [nut]/Reco of the optional nutrients.

SAIN 5_{opt} = (SAIN 5 generic
- (min ([Proteins]g / 65 ; [fibres]g / 25 ; [vit C]mg / 110 ; [Fe]mg / 12,5 ; [Ca]mg / 900))
+ (max ([nut_i]/$Reco_i$ of the optional nutrient))
/ 5 * 100) * (100 / Energy)

Sain 5_{opt11} : optional nutrients are vitamins B6, B1, B2, B9, E, D, zinc, ALA, potassium, magnesium, iodine.
Sain 5_{opt3} : optional nutrients are ALA and vitamins E and D.
Sain 5_{opt2} : optional nutrients are vitamins E and D.
Sain 5_{opt} : optional nutrient is vitamin D

SAIN 5 optional Lip97 formula tested

Principle : different SAIN formula are used according to the lipid content of the food.

SAIN $5_{optDLip97}$: for foods containing more than 97% of their energy in the form of lipids, optional nutrients are vitamins D and E and ALA.
For the other foods, the SAIN 5_{opt} formula is used.

SAIN $5_{optD2Lip97}$: for foods containing more than 97% of their energy in the form of lipids, optional nutrients are vitamins D and E, ALA and MUFA. Two substitutions can be operated, if 2 ratio [nut_i]/$Reco_i$ in the generic formula are lower than the 2 highest ratio [nut_i]/$Reco_i$ of the optional nutrients.
For the other foods, the SAIN 5_{opt} formula is used.

Other SAIN formula tested

SAIN 5 for foods rich in carbohydrates or lipids

Principe : for foods containing more than 35% of their energy in the form of lipids, nutrients used in the SAIN fomula are proteins, fibres, calcium, iron, vitamins C and E, MUFA, DHA and ALA. For foods containing more than 55% of their energy in the form of carbohydrates, the fibre content of the food is multiplied twofold in SAIN 5 calculation.
For the other foods, the SAIN 5_{opt} formula is used.

Annex 4b : LIM formula tested

LIM generic formula

LIM m = (([Dis$_1$] / Max$_1$ + [Dis$_2$] / Max$_2$ + ... + [Dis$_n$] / Max$_m$)/m) * 100

m = number of disqualifying nutrients
Dis$_i$, = amount of nutrient i in 100 g of food
Max$_i$ = maximum recommended daily intake for the nutrient i
Dis$_i$ and Max$_i$ are expressed in the same unit

LIM formula tested

LIM 3 = (([Na]mg / 3153 + [AGS]g / 22+ [AS]g / 50) / 3) * 100)

Na = sodium content in mg/100 g (3153 mg Na corresponds to 8 g of salt)
SFA = SFA content in g/100 g (22 g of SFA corresponds to 10% of an average daily intake of 2000 kcal);
AS = added sugars content in g/100 g (50 g of AS corresponds to 10% of an average daily energy intake of 2000 kcal).

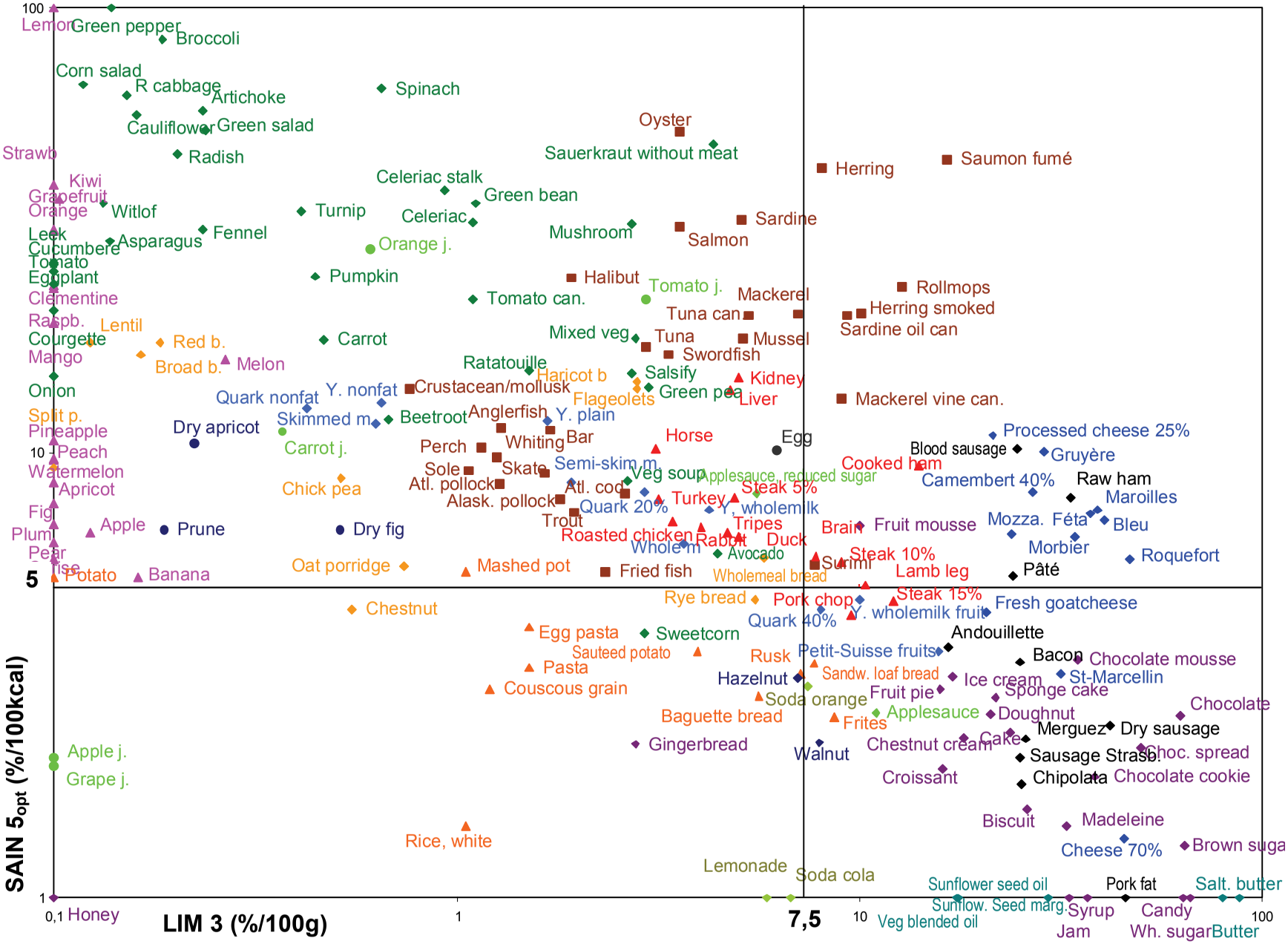
LIM 2
Principle : the highest ratio [Dis$_i$]/Max$_i$ is removed from the LIM calculation

LIM 2 = (**(**[Na]mg / 3153 + [AGS]g / 22+ [GSA]g / 50**)** – max **( )** / 2) * 100)

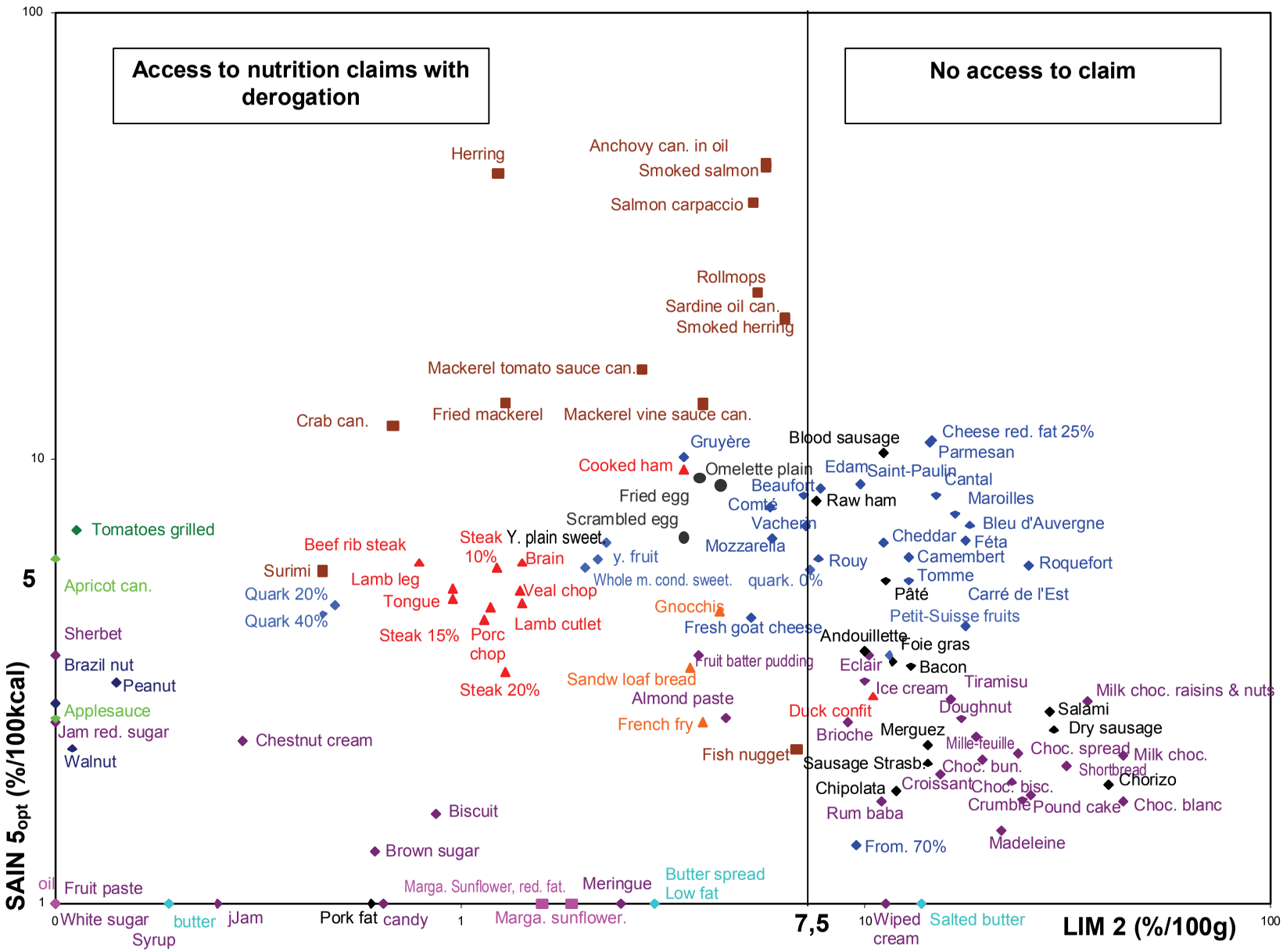
Lim 3$_{liq}$
Principle : LIM 3 score is multiplied by 2,5 for foods defined as liquids

Lim 3$_{gst}$
Principle : total sugars are used instead of added sugars in the LIM 3 formula.
Principle : total sugars are used instead of added sugars in the LIM 3 formula.

Annex 5a : Classification results of the (SAIN 5opt, LIM 3) system

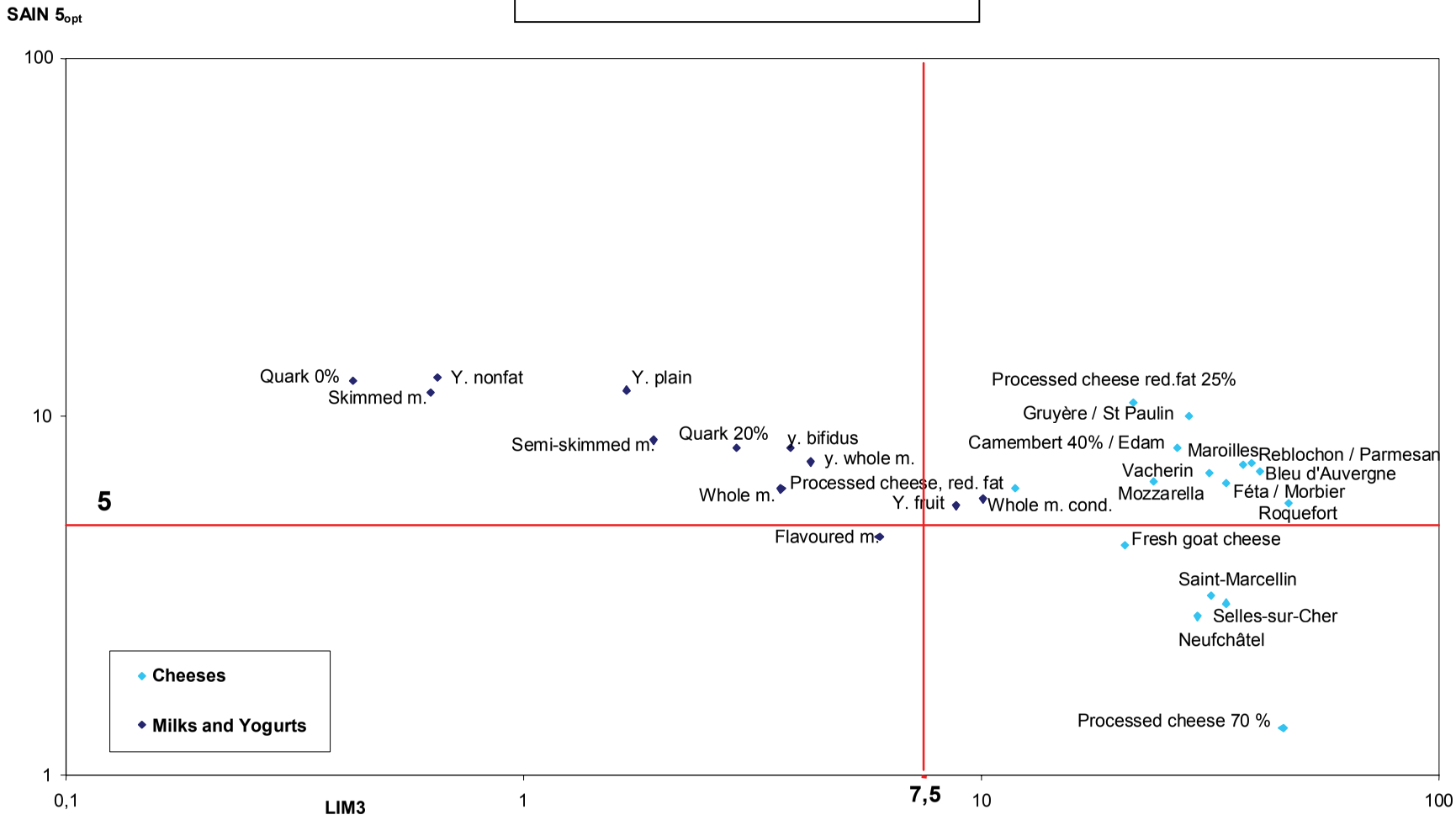


Annex 5b : Results of the application of the derogation within the (SAIN 5opt, LIM 3)system

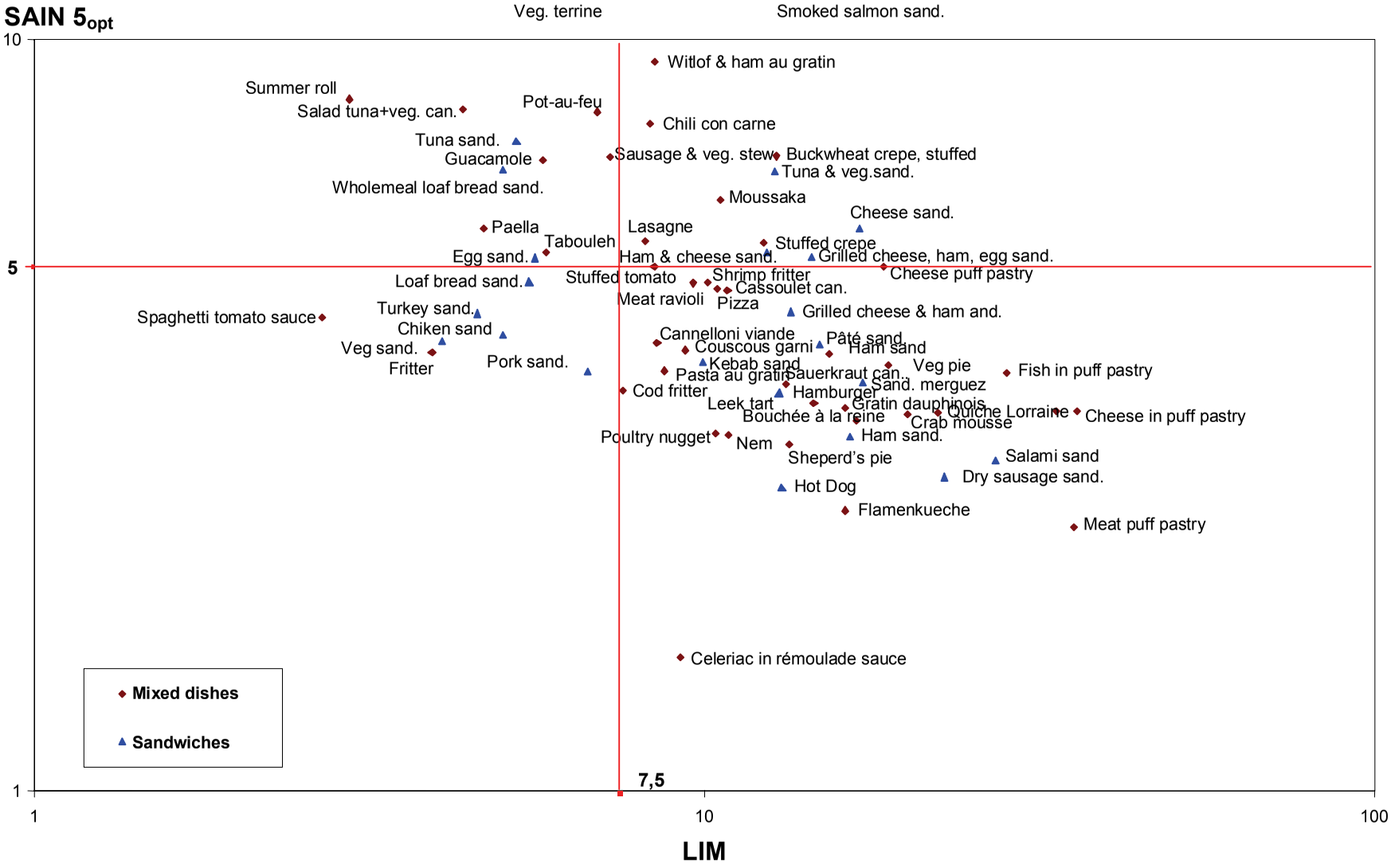


Annex 5c : Classification results of the (SAIN 5opt, LIM 3) system applied to food groups

Graphic 1 : Cheeses milks and yogurts



Graphic 2 : Mixed dishes and sandwiches



Graphic 3 : Fruits and vegetables

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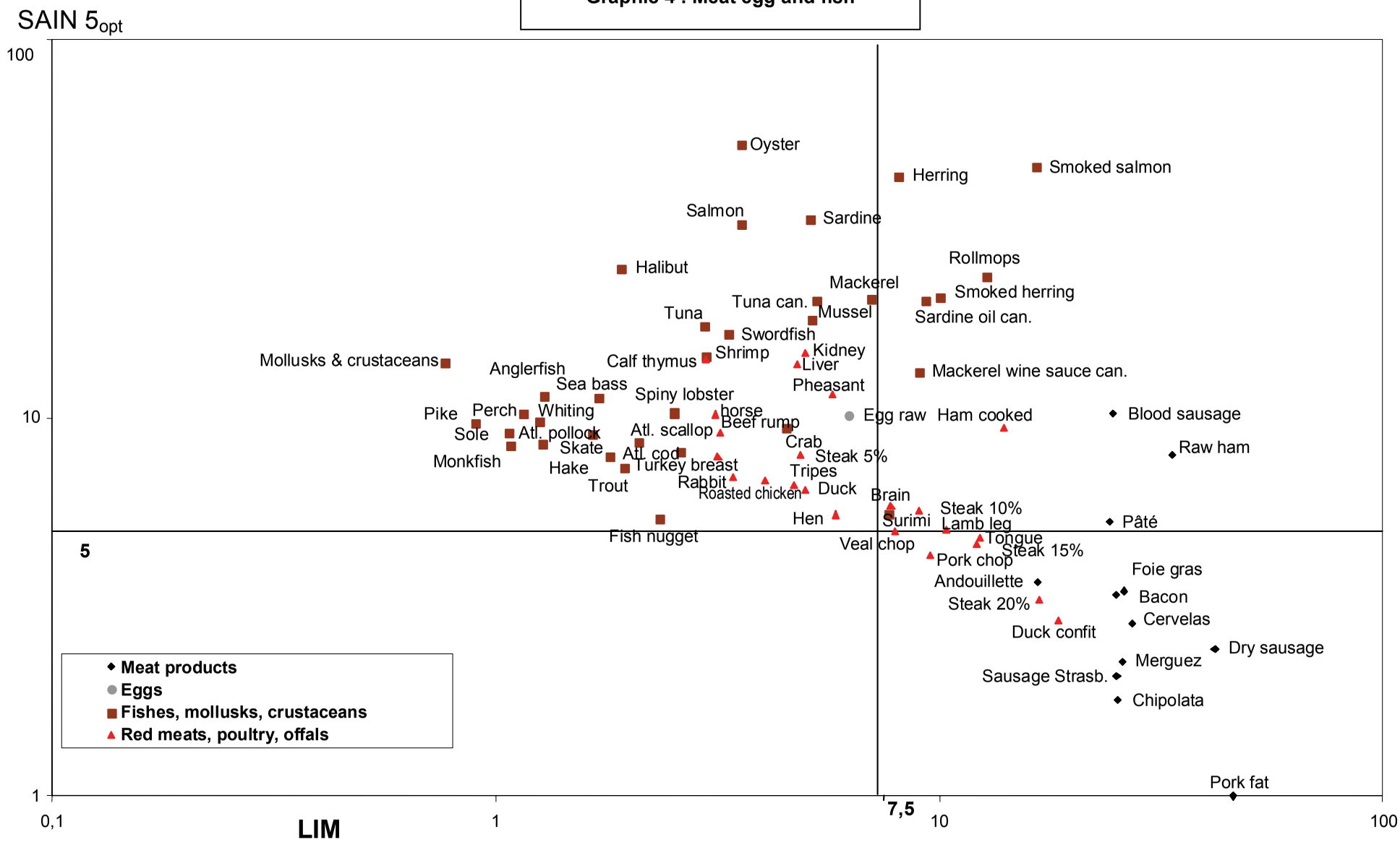
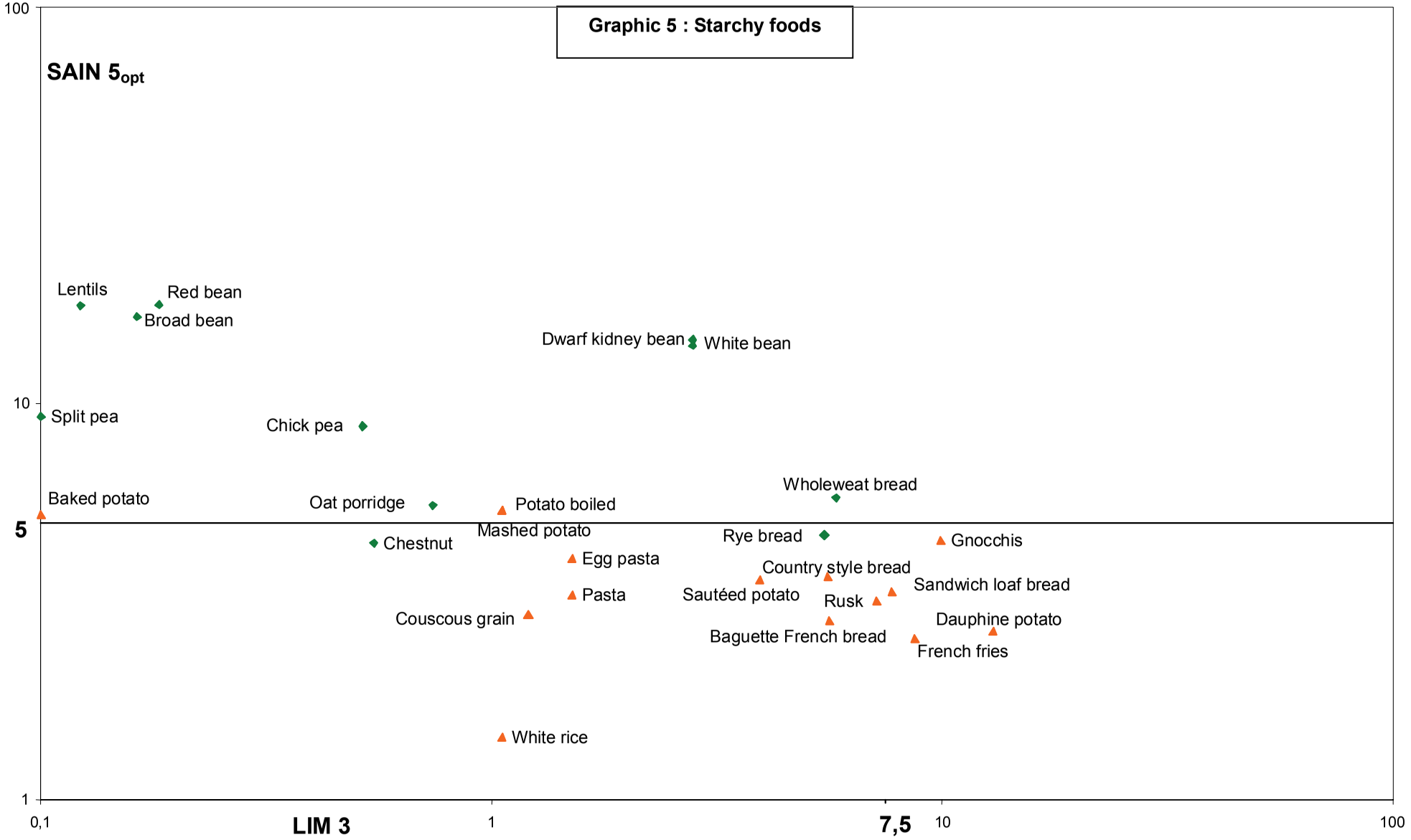
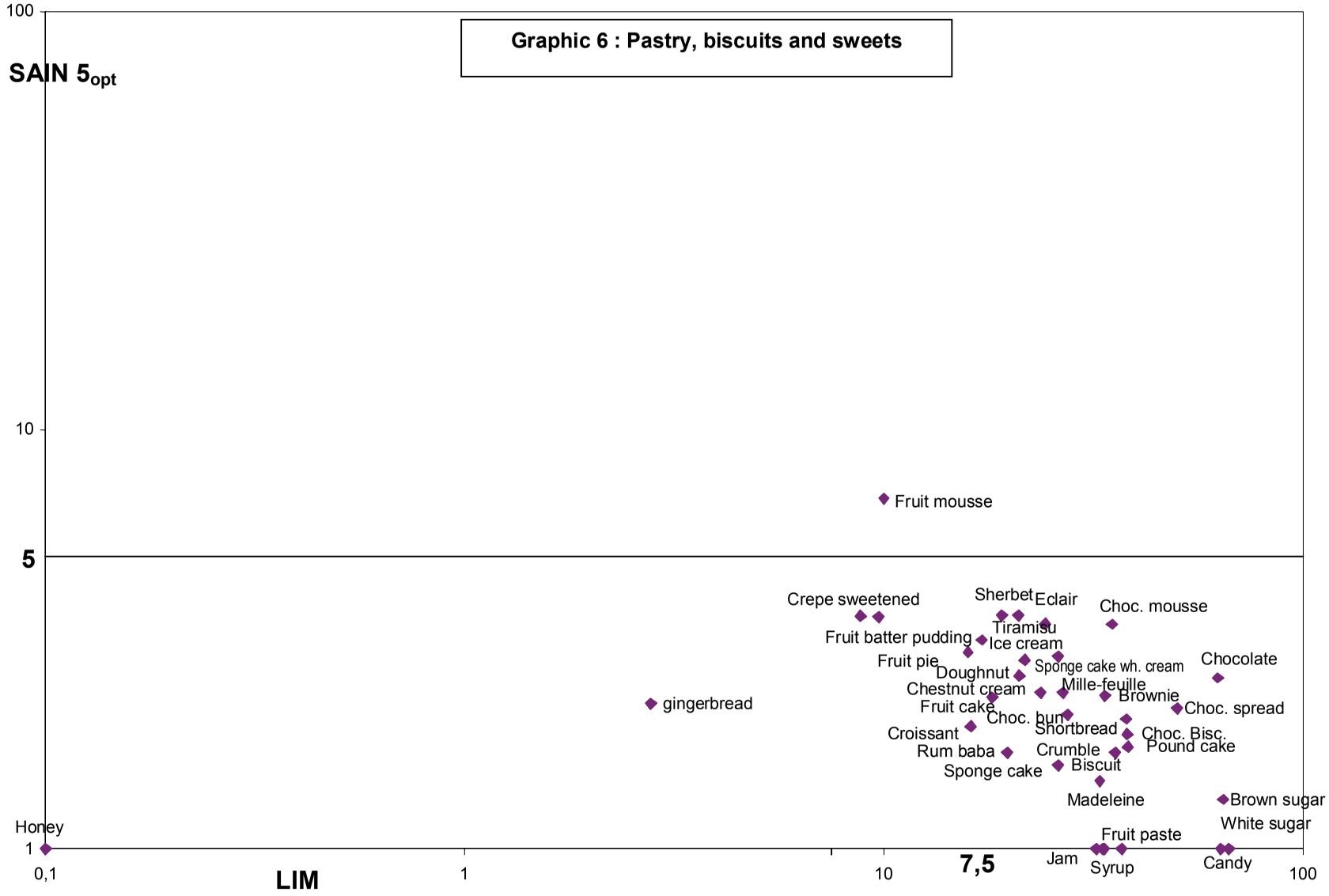
Graphic 4 : Meat egg and fish

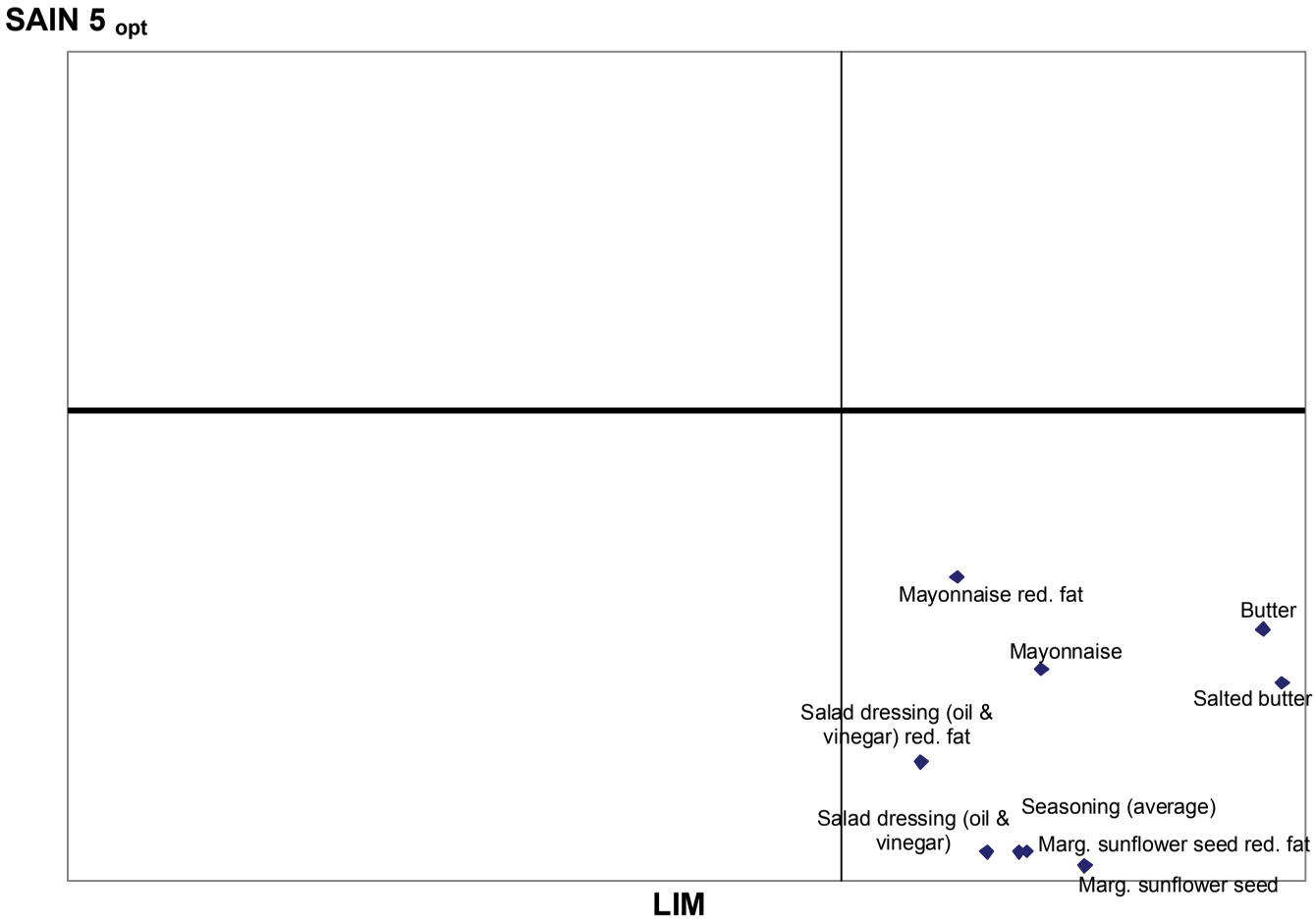



Graphic 5 : Starchy foods
SAIN 5opt
100
10
5
1
Lentils
Red bean
Broad bean
Dwarf kidney bean
White bean
Split pea
Chick pea
Baked potato
Oat porridge
Potato boiled
Wholeweat bread
Mashed potato
Chestnut
Rye bread
Gnocchis
Egg pasta
Country style bread
Sandwich loaf bread
Pasta
Sautéed potato
Rusk
Couscous grain
Dauphine potato
Baguette French bread
French fries
White rice
0,1
LIM 3
1
7,5
10
100
Bread, rice, pasta and starchy tubers
Legumes and unrefined starchy products


Graphic 6 : Pastry, biscuits and sweets
SAIN 5opt
100
10
5
1
0,1
LIM
1
10
7,5
100
Fruit mousse
Crepe sweetened
Sherbet
Eclair
Choc. mousse
Tiramisu
Fruit batter pudding
Ice cream
Fruit pie
Sponge cake wh. cream
Chocolate
Doughnut
Chestnut cream
Mille-feuille
Brownie
gingerbread
Fruit cake
Choc. spread
Choc. bun
Shortbread
Choc. Bisc.
Croissant
Pound cake
Rum baba
Crumble
Sponge cake
Biscuit
Madeleine
Brown sugar
White sugar
Honey
Fruit paste
Jam
Syrup
Candy

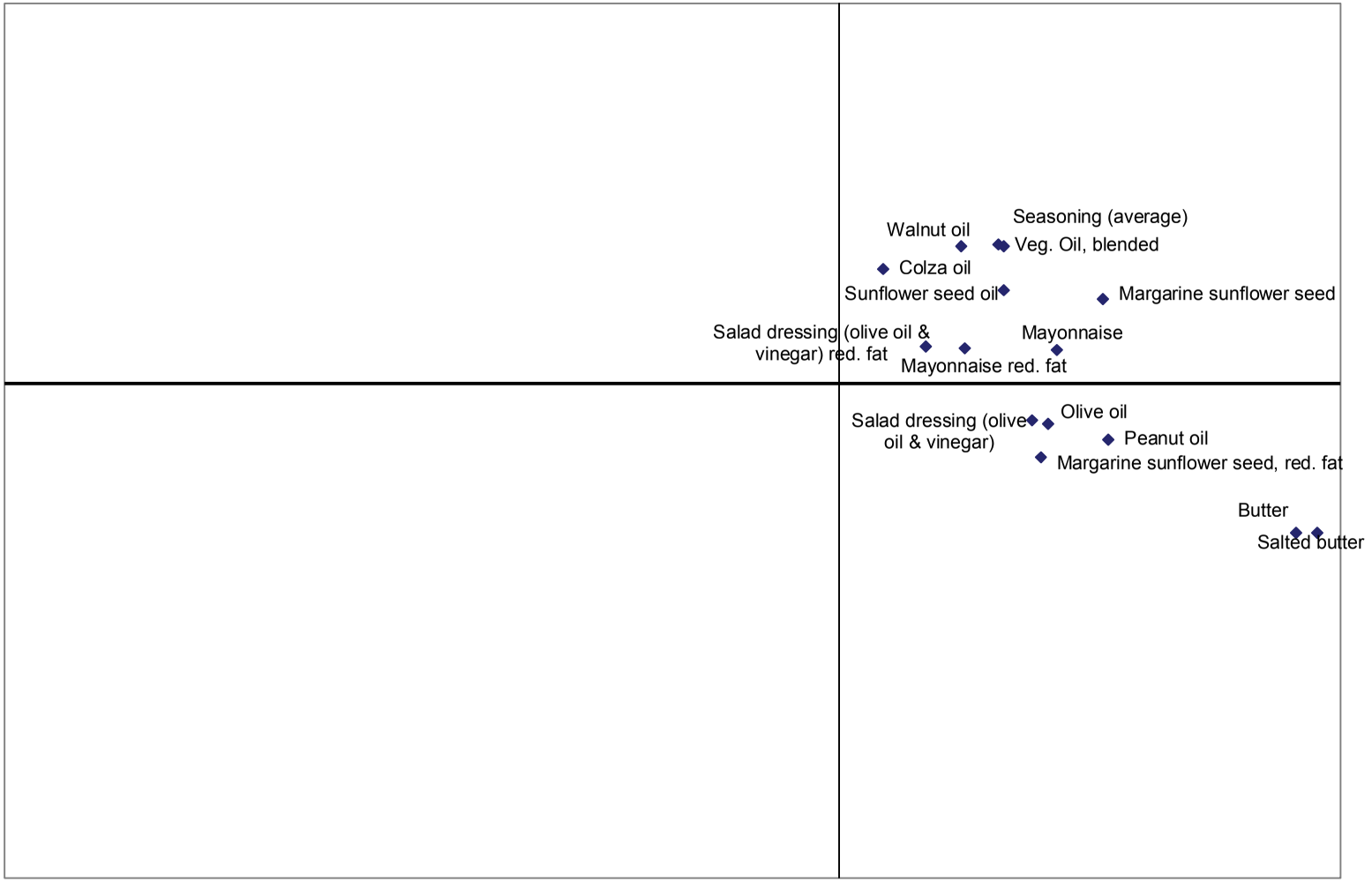
Annex 6 : Classification results of 3 different formula of (SAIN, LIM) applied to fats (Lipids ≥ 97 % TEI)

Graphic 1 : SAIN 5_{opt}, LIM 3



Graphic 2 : SAIN $5_{optD-Lip97}$, LIM 3

SAIN 5 optD Lip97



LIM 3

Graphic 3 : SAIN 5$_{optD2\text{-}Lip97}$, LIM 3