Eurocode 2 Review

and modified

Core Classification

A report to the Danish Veterinary and Food Administration
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Chapter 1 : INTRODUCTION

This report documents a review of the Eurocode 2 food coding system and identifies possible modifications to be incorporated into a revised 'core classification'. The introduction notes some source documents on Eurocode and its evaluation used in the review, briefly describes the overall Eurocode system, and summarises alternative approaches to food coding and description.

Objectives of the initial project

The objective of this initial project for the Danish National Food Agency was to identify modifications to Eurocode 2 that will establish a well-defined and well-documented core classification. The aim was to identify a minimum of changes which would allow the classification within each main group to follow more explicit policies and thus increase the consistency. Thus the work has concentrated at the higher level within each main group, although it has also reviewed the more specific level of the current classification. The aim here was to ensure that the existing specific terms fit into the core classification, rather than to produce a full revised classification to the food item level.

The initial project has aimed to establish a framework in the core classification and its basic documentation that will improve the useability of the coding system, both in the short-term and as its use continues and increases. Development and maintenance of the documentation and other support tools is crucial to consistent and efficient coding, building a collection of accepted assignments to reduce the complexity of coding decisions. The documentation should be actively developed and maintained through the addition and refinement of scope notes, alphabetical term listings, and synonyms and taxonomic names. The core classification has been produced in a form suitable for computer use and maintenance.

Coverage of the report

This chapter provides an introduction to the overall Eurocode system of which the Eurocode 2 food coding classification is the main part. It also briefly reviews other systems for coding and describing foods. Chapter 2 describes key features of Eurocode 2, the hierarchical coding structure, the handling of mixed foods and recipes, the descriptor system, and the documentation. Chapter 3 reviews each of the Eurocode 2 main groups and proposes the core classification for them. The full core classification is brought together in Appendix A.

The conclusion of the report, Chapter 4, suggests how Eurocode policy could be further defined as the basis for continuing development of the system. Enhancements to the Eurocode 2 classification and the proposed core classification are discussed. It reviews the documentation and software support requirements that users require to ensure accurate and efficient coding, and proposes a sequence of development steps for the enhancement of the Eurocode system.

Eurocode sources

This report uses two main sources (Poortvliet *et al.*, 1991; Poortvliet & Kohlmeier, 1993) as descriptions of the Eurocode system. In this report, the first of these will be referred as the Rationale Document and the second as the Draft Manual. The former was later published (Poortvliet *et al.*, 1992). The latter is the *Manual for using the Eurocode 2 Food Coding*

System which was prepared as a draft in March 1993, documenting version 92/2 of the coding system.

Eurocode 2 version 92/2 was evaluated in a study carried out at the International Agency for Research on Cancer, IARC (van Kappel, 1993); the conclusions are noted in Chapter 2. Work at that time included *LanGual translation of Eurocode 2 including descriptors* (Møller, 1993A). Further comments, including those compiled by the CODATA Task Group on Systematic Nomenclature for Foods in Nutrient Data Banks, were submitted to IARC (Møller 1993B).

Overview of the Eurocode system

The overall Eurocode system is summarised in the Rationale Document (p. 4). This describes three components, Eurocode 1 for the identification of specific food products, Eurocode 2 as the hierarchical coding and classification system, and the Descriptor system for coding supplementary information about the foods as consumed. Eurocode 2 and the Descriptor system are discussed in more detail in Chapter 2. The Rationale Document includes a format for classification codes applied to recipes which appears in modified form in the Draft Manual, the latter document also containing guidelines for recipe coding. Recipe coding and the management of recipe files represents a distinct subsystem within the overall Eurocode system, as noted in Chapters 2 and 4.

The Rationale Document defines Eurocode 1 as a list of specific food products, at the brand-name level, providing a product reference serial number. It is thus said to have no classification value. On the other hand, if the Eurocode 1 items are considered as the most specific level of the Eurocode 2 hierarchy, the association adds functionality to both parts of the overall system. Even without formal hierarchical linkage, the Eurocode 1 terms can be treated as 'narrow terms' in the Eurocode 2 thesaurus. In fact this approach is taken in the Eurocode 2 listing of Cheeses and Sausages. Even if the names listed represent the next level above individual brands, this listing provides an adequate demonstration of the principle and is treated as such within the current project.

Other food coding and description systems

Food codes: Food codes should be considered as distinctly different to food classification codes or food group codes; food codes are associated with specific food items. The food codes used will often be those assigned to food items reported in a national food table or other food composition database. In this case, food coding represents the matching of food consumption data directly with food composition records so that nutrient intakes can be calculated.

Food group codes: Foods listed in food composition tables are usually grouped according to the type of food. The top-level main food groups are generally defined along similar lines in different national food tables, and indeed the main groups used in Eurocode 2 were based on the main groupings used in tables. Main food groups may be divided into one or two further hierarchical levels; these can be used to group similar foods together in the printed table, with foods within the most specific level then being listed in alphabetical order. Thus the structure is similar to the three-level hierarchy of Eurocode 2.

However the food table and Eurocode grouping systems serve somewhat different purposes, the first being intended to help users of the table to find and compare similar foods whereas Eurocode is intended to record consumption data at a suitable level of food detail. As a result the classifications and the rules for assigning foods to a place in those classifications may differ significantly. Nonetheless it may be useful to assign Eurocode 2 codes to food items in food table databases as an alternative grouping system for retrieval purposes and to assist in matching records in food consumption and food composition data collections. Unlike direct food coding, however, the use of classification often results in several food items in a food composition database having the same classification code and thus will retrieve several composition records for the consumed food. Thus there must either be a final selection of the appropriate food composition record or a single composite composition record must be generated to be used for each individual classification code. A further, more radical alternative is to make it a design goal of Eurocode coding that it can provide a sufficiently specific representation of reported food items to match these with unique items in food composition tables.

While taking due account of the differences in purpose and thus content noted above, comparison of the classifications in Eurocode 2 and food table grouping systems can be useful in considering difficult areas. The grouping system used in the U.K. food tables to organise the foods in *The Composition of Foods* publications (e.g. Holland *et al.*, 1991B) has a system of main groups comparable with those of Eurocode 2 and also has two further levels. Thus the grouping system and food assignments within it provided a useful comparison with the content of Eurocode 2 for the review of the latter system reported in Chapter 3.

Langual: Langual was developed by the Food and Drug Administration in the U.S.A. (McCann *et al.*, 1988) and is currently maintained under the European COST Action 99, Eurofoods activity. It is a system for describing foods based on a set of 14 independent aspects (called facets or factors), each of which has a list of controlled vocabulary terms that are organised hierarchically.

The faceted approach simplifies the construction of the vocabulary and allows detailed food descriptions to be built from the assignment of multiple terms, rather than requiring the composite terms to be included in the vocabulary. It also provides considerable flexibility since not using irrelevant or unimportant facets of description does not affect the performance with respect to the other facets.

INFOODS food description system: The INFOODS food description system (Truswell *et al.*, 1991) also takes a faceted approach but defines many more facets. In general the facets are used to organise the food description information rather than codify it into a standardised vocabulary. The contents defined for each facet are usually free language although the guidelines may include recommended structuring, for example of food preparation procedures into lists. There may be substructure within a facet, for example giving the language of a text entry or associating a trade name with details of the manufacturer.

Food names: A food group categorises a set of foods as being similar and food description describes a single food in detail. In between, a food is assigned a name to distingish it from all others in a given context such as a food table. Thus the food name represents the level at which it is possible to match a food item with a record in a food composition database. It also can result in food names including elements of faceted food description (Burlingame,

1996; Unwin, 1992). A convergance of the terminology at appropriate hierarchical levels in food classification systems and description facets with the terminology used within food names will help in correlating food consumption and food composition databases.

Summary: Thus there is a range of techniques available for recording information on foods, whether in consumption studies or food composition tables. The options vary in the way the information is organised, in the terms available to identify and describe the foods, and the level of specificity to which this can be done. In practice most implementations combine appropriate aspects of the various techniques but this can be hampered because the main food coding and description systems have been developed separately (in particular with respect to defining the 'language', i.e. the categories identified and the terms used to represent them) in different environments and with apparently different objectives. However there is a basic range of requirements, including defining the food recorded, effecting retrieval of relevant food records, matching consumption and composition records, aggregating data, and disaggregating recipe data back to ingredient data. Between the various systems, most of the necessary techniques are available but are likely to be incompatible (and often insufficiently tested). There is also some user resistance to the systems; they may be perceived as being both complex and incomplete. This may in part arise from shortcomings in the documentation and other support tools available, and possibly also from relatively minor or isolated problems with a system which have a disproportionate influence on the perceived effectiveness of that system.

Chapter 2 : REVIEW OF THE EUROCODE 2 SYSTEM

This chapter reviews the objectives, the overall structure and content, and the current documentation of the Eurocode 2 food coding system.

Introduction

The available approaches to handling information that classifies, identifies and describes foods as recorded in food consumption and food composition data collections were briefly reviewed in Chapter 1. It was noted that approaches need to be combined in practical implementations and their compatibility needs to be increased. This will be helpful in the development of increasingly functional systems with a wide range of applications. In this Chapter, the Eurocode 2 system is discussed in more detail with a view to identifying modifications and enhancements that might develop it in that direction. Suggested changes should take account of the conclusions of the earlier evaluation and the objectives of the system. The individual Eurocode 2 main groups are reviewed and a revised 'core' classification covering the higher level of the hierarchy is presented in Chapter 3. As a basis for this review, the various features of Eurocode 2 are described here.

The Eurocode 2 evaluation

As noted in Chapter 1, Eurocode 2 version 92/2 was evaluated at IARC (van Kappel, 1993). The evaluation involved about 50 participants from different European countries coding a range of food items general to Europe, local foods and a recipe. The results were good for the coding of the European foods down to the sub-group level. The coding of local, commercially available mixed foods gave problems, as did recipe coding and the assignment of descriptors.

Participants found the classification to be incomplete, particularly in the Meats group, and to fail in recording the type of fat used to prepare foods. It was considered not specific enough, particularly as a basis for nutrient calculation, and to need improvement by the addition of extra generic names and mixed foods, in the principles of recipe coding, in the principle and completeness of the descriptor system, and in the manual. Concern was also expressed about the organisation required to maintain the classification system, for example in allocating new food and recipe codes.

Objectives of Eurocode 2

Any review of a system must take account of its stated objectives. And so must the uses to which it is put. This may be one reason for some dissatisfaction with the system, for example as expressed in the earlier evaluation. However if Eurocode is to be generally useful in recording consumption survey information, it probably needs to meet adequately the requirements noted at the end of Chapter 1. These are for defining the food, retrieving relevant foods, matching with food composition records, data aggregation and the back-calculation of recipe information to determine the intake of ingredients and their nutrient contributions.

The aim of the Eurocode 2 food coding system stated in the Rationale Document (p. 4) is "for use with food consumption surveys for nutritional epidemiology in Europe, and for related work". This is seen as excluding its use for recording consumption to produce results for

individuals. This is perhaps reflected in the inclusion for all the main groups of a sub-group "for dietetic use", use of which would lose much information for an individual whose diet consisted of a significant number of such items.

Further definition and analysis of the objectives should perhaps be undertaken since assumptions about these clearly influence decisions on the classification of food items within Eurocode 2. For example, it is stated that a coding system should "adequately reflect distinctions among foods that are nutritionally important in the European diet. At the same time, it must not become excessively complex to closely match foods that do not make a significant contribution to the average European diet, regardless of the nutrient levels in such foods". This raises three of the key issues.

Firstly, a coding system designed to record and thus assess food consumption should not be based on preconceptions of "foods that are nutritionally important in the European diet" unless these have been measured independently (and will continue to be so in order to define necessary modifications to Eurocode 2[1]). Since Eurocode may be used as the means to measure foods important in the European diet, it should be designed to give equal weight to all foods which may be recorded.

Secondly, much nutritional epidemiology may relate to population groups in Europe that do not consume an "average European diet". Equal weight should be given to foods that are important in ethnic diets. An example noted in a preliminary review prior to this work was the Edible fungi sub-group (8.6) which has detailed items for species grown in Europe but no provision for oriental species.

Thirdly, there is the question of what makes a coding system "complex". There are two separate aspects, complexity for the user in identifying and recording the foods reported and complexity in the storage of that information. Hitherto these have been inseparable because recording involves the manual assignment of the storage codes. This report refers to existing codes but for modifications, in particular the core classification, it only uses named categories. The association of categories selected by the coder with storage codes should be considered an implementation issue, preferably satisfied by adequate computer support systems. The topics of codes and coding support systems are discussed further later in this chapter and in Chapter 4, respectively.

The formulation of more detailed objectives should also include the requirements for subsequent processing of the recorded consumption data. Probably the three requirements of those stated earlier that need most careful specification are the aggregation of data at higher levels of the hierarchy (e.g. main groups) or by descriptor facets, calculation against food composition data, and calculation of the contributions of basic foods to consumption including back-calculation from recipe codes. These and any other objectives need to be fully specified to ensure that the Eurocode 2 classification, the recipe coding system and the descriptor systems record information at the necessary level to produce the desired results from the consumption data.

[1] It may be considered that this is done, for example, in the selection of foods for inclusion in national food tables. However the place of Eurocode in the overall system needs to be explicit.

Classification hierarchy

The structure of the Eurocode 2 code allows up to 4 numeric fields representing the classification hierarchy. However there are also possibilities for non-numeric characters in each field qualifying the code and thus the overall representation of each field must be alphanumeric. The first three fields are available to represent the Eurocode 2 standard food classification hierarchy. The first identifies the main group, the second a sub-group and the third a food item. The latter may in reality be a second-level sub-group (and indeed was called this in the Rationale Document), but it is considered clearer to refer consistently to this as the food item level; this approach is also taken in the Draft Manual. The first, main group, field may have an alphabetic suffix either of 'X' representing a generic mixed food or a two-letter country identifier associated with a national recipe code in the final field.

The fourth field is only used for national recipe codes. Using the final field, a national recipe code can also appear as the third field if the Eurocode category is only defined down to the sub-group level. The coding of mixed foods and recipe items is discussed further in following sections.

An important question for the classification, and thus the code used to store it, is whether two levels within each main group provides an adequately deep hierarchy. The initial proposal for this work suggested that the core classification to be defined might need extra levels which would then be shoe-horned into the three-level system. In practice the more frequent problem is to define grouping categories which are discrete, with all consumed items clearly within or outside the definition, an example being cultured and fermented milk products. The absence of suitable candidate categories to be defined as sub-groups can result in long lists of food items. This need not be a problem if the items names are unambiguous and the list is complete for the reported consumption items. However it is likely to be a problem if items in a category are heterogeneous, ill-defined and incompletely listed as is, for example, likely to be the case with any classification of miscellaneous foods.

There are two factors which may dictate that intermediate hierarchical structure is necessary, namely that consumption needs to be recorded at that level and that data need to be aggregated at that level. The latter is less critical if it is assumed that there will be methods for defining how data are aggregated that are independent of code hierarchy. This will be required for aggregations involving descriptors, for example in calculating the consumption of 'Fried fish', and should allow for aggregation on selected sets of classification categories, for example to calculate the consumption of 'All milk, including soya milk'.

Thus the need to record data at the level at which they are reported is probably a more important factor in deciding the categories to be included in the hierarchical structure than the need to aggregate data using the prefined classification. The main problem with recording data at an appropriate level arises in the 'Meat and meat products' main group; this is discussed further in the review of that group in Chapter 3. Another factor to be considered is consistency where the classification separates similar foods into different parts of the classification, such as different main groups which may have different subdivision rules and the foods may appear at different levels. The handling of soya products provides the most clear-cut example in that these are not coded further, in contrast to foods such as milk and flour for which they provide analogous products.

There are some cases where extra levels in the hierarchical structure might be useful to allow the coding of more precise information. For example, in the major mixed food categories in the Miscellaneous foods group, the second level records the main group for the major constituent of foods for soups, sauces, etc. There could be circumstances where the ability to code the main constituent more specifically might be required. Apart from a few instances such as in the Meats group, any requirement for extra levels mainly applies to the more specific levels of the classification and thus, as noted above, does not significantly affect the proposed core classification. A major factor in applying the present limitation to the hierarchy was probably the (non-)acceptability of the longer codes required to represent the additional levels. This problem reduces if coding support systems present named categories, hierarchically organised, rather than requiring user interactions with the classification codes, as discussed in the next section.

Codes and the logical ordering of categories

Eurocode 2 is a food coding system and the codes are often seen as its central feature. Although alternative mechanisms for finding codes, such as an alphabetical food list, are provided to aid coders, it seems natural that the authoritative listing of the system should be based on a listing of categories in code order. However the use of codes and of lists ordered on them has distinct disadvantages.

There may be some situations where manual coding (as opposed to the direct input to computer) remains the requirement but almost certainly this will be followed by computer input and automated calculation of results. Thus some continuing manual use of codes must be expected. However this may be error-prone during coding or input, for example the simple omission of a period (decimal point) character may result in a valid but incorrect code.

Although the Rationale Document (p. 6) notes that the code lists are not necessarily ordered so that related categories are adjacent in the list, this is not clearly stated in the Draft Manual. The problem is that the majority of sub-groups and many items are listed in an order that appears logical to the user, making it easy to miss any entries which are listed in an unexpected position. It is not possible to maintain the classification codes in an order based on a logical order for the categories since new sub-groups and items must be added as the need arises, without changing existing codes. Thus the use of code-ordered documentation should be avoided as far as possible; categories should be listed in an order which based on a consistent logic where possible. This requires an ordering mechanism separate from the Eurocode 2 code (which in any case because of its content cannot be used directly to sort lists). By default this may be the physical order in which the codes are listed, but ideally the distribution file used to disseminate Eurocode and coding support software should implement explicit ordering mechanisms, possibly allowing alternative logical orders to be defined.

Codes should be considered a storage mechanism rather than a coder aid. Coding support systems should locate categories through the use of terms close to those reported during surveys, including comprehensive synonym lists. The core classification presented in this report uses listings of category names which do not include the underlying storage codes. The core classification database file incorporates mechanisms for listing categories in logical and Eurocode order, as noted in Appendix B.

Mixed foods and recipes

A single food is defined as a food that does not consist of more than one ingredient, excluding salt, and a mixed food is defined as one which is a mixture of single foods. A mixed food may be associated with a recipe file which records its ingredients.

Mixed foods are indicated by an alphabetic suffix to their main group numeric code, an 'X' unless there is an associated national recipe file in which case it is a two-letter country identifier. When the country identifier is present, the final field identifies the recipe file rather than a Eurocode category. Thus 6X.2.14 codes a meat pie and 6GB.2.14.3 identifies it as being based on British recipe number 3 within that category.

Some Eurocode categories always represent mixed foods; these have the 'X' listed as part of their Eurocode and are referred to as generic mixed foods. In other cases the 'X' is added when appropriate, for example in coding a Cod dish as 4X.4.2. There is no overlap between codes for single foods and for generic mixed foods except in the Grains group. In Wheat products, flours and breads overlap, for example the code for Semolina is 6.1.1 and that for 'Wheat loaves/rolls, unspecified' is 6X.1.1. Also other grains have pairs of codes such as 6.4 for 'Barley, grain/miller products' and 6X.4 for 'Barley breads and dishes'.

A sequence of 5 rules is applied when classifying mixed foods. The first rule is that if there is a generic mixed food code for an item, this should be used. This could depend on interpretation of the food name, for example whether 'Apple crumble' should be considered an apple pie. If so, it would be coded as 6X.2.12 rather than as an apple dish, 9X.2.1, even though it is composed of about 60% apple and 15% cereal. The next rule, if the mixed food is not a generic mixed food, is to classify it "according to its specific cultural identity, irrespective of the main ingredient". The example given is that Chilli con carne is considered a bean dish in the Netherlands and should be coded as such even if meat is the main ingredient. If there is no clear cultural identity, the next rule is to code on the basis of the main ingredient. If there are roughly equal amounts of ingredients the next rule specifies that if one of them is meat of fish, this should provide the basis of coding. Finally if meat or fish is not involved, the food is classified according to its main carbohydrate constituent, with grains being given precedence over pulses, and pulses over potatoes.

The cultural identity rule was presumably introduced to avoid problems coding foods with two roughly equal main ingredients which can vary significantly in relation to each other. The extent to which this can be applied to a range of dishes needs to be assessed, together with whether it should operate at a national level or would be best defined centrally so that dishes are coded consistently across Europe. The degree to which the rules should be directed to making coding consistent between countries needs to be defined within the Eurocode objectives.

The current coding rules for mixed foods mostly address the question of choosing between different main groups. However on occasions there may be choices to be made between sub-groups or items within a main group. Alternatively, in some cases it may be considered appropriate to add sub-groups for mixtures as has been done for vegetable and fruit salads. Documenting additional policies for difficult areas such as these would not only help in improving the classification with consistent enhancements but also aid coders in selecting categories consistently.

Analysis of the examples in the Draft Manual illustrates some of the difficulties which may be encountered coding mixed foods. It may be noted that in the example (p. 12) of Irish stew, the rule used was that of main ingredient rather than cultural identity. The recipe (Chan *et al.*, 1996) also raises the question of how the main ingredient is assessed. It contains equal weights of lamb and potato but also includes substantial amounts of onion and carrot. Thus at the main group level the main ingredient is vegetables rather than meat.

Custard and Trifle are also used as examples. Milk is the main ingredient of Custard. The type of milk (and hence fat content) might or might not be known, giving four alternative codings, 1GB.1.*n*, 1GB.1.2.*n*, 1GB.1.3.*n* and 1GB.1.4.*n* (where *n* is the recipe number, which would best be kept constant for the same basic recipe across the various milk codes). Custard, not sponge cake as stated in the Draft Manual (p. 93), is the main ingredient of Trifle (Holland *et al.*, 1989), and thus its codes would be the same as the ingredient Custard except that the recipe number would differ. This illustrates the potential problem with recipe variants; they can generate many separate recipes which must be handled as a group if the correct option is to be consistently located and selected by coders. Also this is a situation where improved performance can be expected from a faceted system. For example, once it is recorded that a recipe contains milk, it should not be necessary to predefine recipe variants for each alternative milk but to record this separately in association with a single recipe record.

It is important to note these complications since they may cause coders difficulties and possibly lead to inconsistent coding of mixed foods and foods coded as recipes. The importance of this will depend on the relationship to recipe information; they will be less important if consumption is calculated on the basis of recipe ingredients than if it based on the overall code for the mixed food.

Mixed food codes are enhanced into recipe file references by replacing the 'X' with a country identifier and appending an extra field with the recipe number or other identifier. The recipe file system is proposed as working on a national basis. However there are possibilities for using recipes internationally, for example those published in national food tables, and this should be encouraged where the variation between national recipes is likely to be less than the variations between the dish as prepared within a country. In many cases the recipe details will be determined by cultural context (such as ethnic community) or place of consumption (home, restaurant, take-away) as much as by country of consumption. Food items which are traded internationally (possible examples include Spanish sangria, Draft Manual p. 96, and increasingly frozen and chilled convenience meals) should either be coded as a mixed food rather than a recipe, or be given an international recipe designation. National factors will influence recipe detail, in some cases systematically, but other factors (and differently bounded geographical areas) may be equally significant.

Although the national level may appear to have organisational advantages, it is equally likely that each survey group will maintain its own recipe file. If coded consumption data are interchanged, it may frequently be necessary to include recipe records. A two-level system of internationally used recipe codes (to include recipe details published in national food tables) and specific organisational codes may be as practical an option as nationally based recipe management.

Recipe ingredients are identified through their Eurocode 2 code. There are potential problems

with this in that all food items covered are supposed to be edible and ready for consumption. Key recipe ingredients may be omitted. For example, milk-based beverages made up from a powdered product can be coded as a milk-based mixed food but not as a recipe identifying the ingredients which might be nutritionally significant. A policy needs to be developed on the inclusion in the Eurocode 2 classification of ingredient-only food items and to ensure that ingredients added in a state different from their consumed state can be adequately described in a recipe file. The example of a recipe file in the Draft Manual (p. 9) needs further clarification on the as-consumed aspect of recipe ingredient entries.

The descriptor system

The Eurocode 2 classification allows the identity of consumed foods to be recorded using a hierarchy of categories which reflects their biological origin (for meats, vegetables, etc.) or product type (for dairy products, beverages, etc.). The categories are intended to represent foods in the prepared state, ready for consumption. In addition to information on the basic product as recorded by Eurocode 2, other factors may be relevant to consumption studies, for example in calculating nutrient intakes or identifying risk factors of food processing. Thus a method of recording additional information about the foods consumed is necessary.

The Eurocode descriptor system (referred to henceforth as the Descriptor system) provides this by defining descriptors that may be added to the record of a consumed food, or that of a recipe ingredient. The descriptors are divided into 5 groups which describe independent aspects (referred to here as facets) of processing which may have been applied to a food prior to consumption. These are Thermal treatment, Non-thermal treatment, Preservation/packing, Component added and Component removed. Currently there are 80 descriptors defined over the 5 facets. The descriptor codes consist of a letter representing the facet followed by a number identifying the descriptor within that facet, for example T1 represents the descriptor *Baked* within the Thermal treatment facet.

The full title of the first facet is 'Thermal treatment at consumption', presumably to indicate that it deals mainly with cooking method immediately prior to consumption rather than in the original processing or preservation of the food product. However two descriptors, *Dried* (T5) and *Canned* (T22) (the former not necessarily thermal) are normally processing and preservation treatments prior to retailing. A descriptor is included for *Uncooked (raw)* for two uses, to specify this when a food may be assumed to be consumed cooked and to indicate that information such as the recorded weight is measured prior to cooking. The guidelines on the former use are rather arbitrary; if there is no descriptor, carrots are assumed raw and cauliflower is assumed cooked. The latter use of the descriptor is a distinctly different aspect, describing the food when measured in a different state from its state at consumption and forms part of the discussion of the Component removed facet.

The Non-thermal treatment facet covers food preparation procedures that do not directly involve heat although this may also be required, for example *Coated, batter* followed by frying. Other descriptors relate to the mechanical treatment of food; there is scope for these to be extended and more clearly defined. *Chipped, diced* and *sliced* may be useful additions since they may affect factors such as fat uptake. At present French fries can be coded as deep-fried potatoes but not for their relationship to a whole potato. If the term *Minced* is to be reserved for meat, the appropriate term for other minced foods should be documented. Procedures such as sieving, straining and dissolution in water may also be relevant in some

situations, for example in recipes. The descriptor *Marinaded* is probably more appropriate in this facet than being a preservation/packing method.

As noted above, the terms *Dried* and *Canned* may fit better in the Preservation method/packing medium facet. Multiple terms may be required from this facet, for example *Canned* and *Packed in syrup*. The documentation for the generic term *Packed* implies that packing involves the retail use of a non-temporary container, but it is unclear whether the same constraint applies to the terms for packing in specific media. In effect, a clarification between process (e.g. canning), container (e.g. bottle) and medium (e.g. syrup) needs to be made. Further candidate terms include *Chilled* and *Packed in a modified atmosphere.*

The Component added and Component removed facets allow modified forms of Eurocode food items to be recorded. Some general guidelines on their use are needed and the formulation of these may suggest changes to the current list of descriptors or to the way the descriptor system is implemented. For example, it is not practical to record a text statement of the vitamins (and/or minerals) added each time a commonly consumed fortified food is encountered.

The Component removed facet currently includes both components such as caffeine and parts of the food such as *Skin/peel* and *Non-edible part.* Although the meaning of the latter is defined, its use is not. The overall Eurocode policy of coding foods as they are consumed should normally render it unnecessary, with descriptors being used when the food recorded is not as consumed. At present a food can be recorded as *Uncooked (raw)* using the Thermal treatment descriptor which may mean it is consumed raw or recorded in its state prior to cooking. Other aspects relating to the reported consumption of a food item include it being weighted with inedible matter (whether or not it is cooked), weighed prior to cooking loss or gain, and weighed prior to preparation loss. These possible requirements, which may include additional ones for reporting recipe details accurately, may be best handled as a facet separate from the Component removed facet.

One aspect of the current main Eurocode classification which might be more flexibly handled through a new descriptor facet is the regular appearance in each main group of a sub-group "for dietetic use". These sub-groups are briefly documented in the Draft Manual (p. 98) in the notes on main group 13, 'Products for special nutritional use', but this does not include a clear statement on the dividing line between special products for dietetic use and more widely consumed products modified for dietary effect, for example low-calorie drinks. Assigning special products to their own sub-group loses information on their natural sub-group. This information would be retained if the special usage were to be recorded through a descriptor, perhaps in a 'Use context' facet which might also be used for somewhat different aspects such as place of preparation and consumption (home, restaurant, take-away, etc.).

Documentation

The Draft Manual provides a basic description of Eurocode 2 and the descriptor system, lists the defined categories and their codes, and gives some additional guidelines and examples to help in coding. Although it is already quite an extensive document, it is possible to identify additions as well as modifications which would increase its usefulness to coders and as a comprehensive description of the Eurocode system.

Some further discussion of the principle that Eurocode records foods as consumed might be helpful, including the implications of this for recording consumption quantitively, for example in terms of what was weighed and for the recording of recipe information. The guidelines for the use of descriptors, and the assumptions that are implied by the lack of descriptors, should be reviewed at the same time so that these become integral to the normal use of Eurocode except in its simplest applications.

As discussed earlier in this chapter, it is perhaps more important that consumption records accurately reflect the details of consumption as reported than that the coding is determined by the needs of data aggregation. As long as the data are unambiguously recorded, required aggregations can be mapped later. The emphasis for the coding system, its documentation and its operation should be on supporting accurate coding in relation to the foods as reported by subjects. The aim should be to continually improve the lists of synonyms and other terms likely to be encountered during coding so that increasingly it becomes possible to code from look-up lists. At present the alphabetical listing of food names for looking up codes only covers those which exist as names (and synonyms) for Eurocode categories. For example, the term Egg noodles is not in the food index except embedded in the entry but would be a natural entry point for a coder. Although coders will learn codes, at present the documentation gives the impression that most codes are having to be deduced repeatedly. This need should be reduced as much as possible in the interest of efficient, accurate and consistent coding.

Chapter 3 : REVIEW OF THE MAIN GROUPS

Each of the Eurocode 2 main groups is reviewed in this chapter and the proposed core classification is presented. The core classification lists categories at the sub-group level, incorporating some changes suggested from the review and providing scope notes and examples of the food item level as appropriate.

This review of the individual Eurocode 2 main groups notes problem areas for coding, both as identified in previous work and the current study. It suggests modifications to the classification or policies for its use that may remove or reduce the difficulties, using these as the basis for the proposed core classification.

In this chapter, the core classification proposal for each group is included so that it follows on from the review and conclusions for that group. The full core classification is brought together as a single list in Appendix A. The core classification is for the most part a revised list of the sub-groups within each group, although it breaks down some Products sub-groups into subdivisions. These might either be implemented at the food item level or, preferably, would be sub-groups in their own right without being subordinate to a single Products category. The routine "for dietetic use" sub-group is not listed since it is proposed that this information should be handled through a descriptor, as discussed in Chapters 2 and 4.

The core classification lists category names but not codes. These are omitted for three reasons. They are seen as the means of storing the category, not representing it to the user (although it may be decided that they are required by coders in which case their structure and content may need to be reviewed in relation to the core classification proposals). Secondly it is desirable that the classification is listed in a logical order, independent of the order in which codes were assigned. Finally, it was not considered useful to list new codes until the core classification is agreed, although these are included in the core classification database.

The listings include some additional scope notes where the definitions of categories in the current Eurocode 2 need clarification. They also include example food item categories which should be included in the sub-grouping, in many cases citing items that have been noted as missing or problematical within the existing classification.

Main Group 1 : MILK AND MILK PRODUCTS

Overview: The group is divided into 10 sub-groups, including the regular 'dietetic use' category. Most of the sub-groups are further subdivided into food categories, in many cases on the basis of fat content.

Review: The first sub-group Milk (1.1) is subdivided by fat content and does not distinguish the producing species, and indeed includes human milk. This is in contrast to several other main groups where an important aspect of the classification is the source species. Species is crucial in one respect in that it must be animal. This gives rise to an anomaly in that mammalian milks can be coded as such, but without recording the species, whereas Soya milk is coded as a soya bean product, but cannot be coded as a milk (and therefore cannot be distinguished from, for example, Soya flour).

The categories in the Milk sub-group are used to code a range of mixed foods consumed at breakfast or as desserts for which milk is the main ingredient. Appendix V of the Draft

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Manual discusses this further but could be improved for clarity. For example, "coded ... according to their fat content or source milk" gives two potentially different alternatives but probably should read "coded ... according to *the* fat content *of their* source milk". On the other hand, breakfast cereals taken with milk are coded at their own Cereal Products sub-group (6.11), which may give rise to ambiguity, for example in the case of Porridge made up from Oatmeal. If it is made up with milk, the text suggests it should be coded as a milk dish whereas if it is made up with water (presumably even if consumed with milk) it should be coded in the Cereals main group. Since it can also be made up with milk and water (Holland *et al.*, 1988), more detailed guidelines may be required (even if this is considered as a rather specialised case).

The coding of milk beverages needs to be considered. In the first place they are treated as mixed foods of the basic milk ingredient, but currently they cannot be coded in more detail as a recipe since there are no categories for their powder base to allow this to be included in the recipe file.

The remaining sub-groups include the main product type categories of cream, yogurt and cheese, with others for the more minor categories of kefir, whey, other fermented milk products (as discussed in the Rationale Document, pp. 9-10) and cheese substitutes. There is also an Ice cream sub-group which includes non-dairy ice cream and water-based ices.

The Cream sub-group is subdivided on fat content, with the category Cream, >30% fat as the highest. Since Double cream is 48% and Clotted cream as high as 63%, at least one further high fat category might be defined. Imitiation cream is currently coded as Non-chocolate topping (10X.7) but this needs to be reviewed once an overall policy of product types in relation to dairy substitutes has been defined.

The Cheese sub-group is well documented through the listing of individual cheeses under the appropriate categories (noting that some names have to be associated with more than one category). Addition of country indicators as appear in the listings of sausages would be useful. The documentation of cheeses and sausages provides a basis for expanding the thesaurus and implementing it in coding support systems. The Cheese substitutes sub-group is described in the Rationale Document but not in the Draft Manual. Some further clarification is required of the coding of non-dairy products in this main group, in particular whether the category Cheese substitutes is an exception to the exclusion of soya-based products.

Conclusions: Although there may be some scope for improving the sub-group level, for example by attempting to separate processed milk products (including soured milk) from liquid milk, the group has already been considered in detail, for example in the Rationale document. It is likely that changes to the classification would creat as many problems as they might solve and therefore the current sub-groups are retained for the core classification. Improved coding possibilities are more likely to result from better defined options for the used of the Descriptor and Recipe systems, particularly when assigning food items to the Milk sub-group. However the biggest improvement would result from the successful formulation of a policy to base the group's classification on product type, as discussed in Chapter 4, and thus to provide a consistent approach to the coding of substitutes such as soya milk and cheese, imitiation creams and cheese substitutes.

Core classification:

Milk and milk products	*Scope notes and example items*
Milk	Liquid milks, including fortified, UHT and sterilised products, and reconstituted dried milk, subdivided on fat content. Also items for buttermilk, soured milks and condensed milks
Cream	Subdivided on fat content
Kefir	A fermented milk drink containing alcohol and carbonated
Yogurt	A product of lactic cultures acting on milk. Subdivided by fat content
Whey	Residue from milk after removal of casein and most of the fat as the curd
Other fermented milk products	Excluding kefir, fermented (i.e. alcohol-containing) milk products. Subdivided by fat content
Cheese	Subdivided by type (hard, soft, fresh) and, for each type, by fat content
Cheese substitutes	Imitiation cheese products in which part or all the milk fat is replaced by plant oils or other fat substitutes
Ice cream	Dairy and non-dairy ice cream and other frozen confections, e.g. water ices and sorbets

Main Group 2 : EGGS AND EGG PRODUCTS

Overview: The Eggs and egg products group is the simplest of the main groups, being divided into 4 sub-groups only one of which is further sub-divided to the food item level.

Review: The group consists of 3 sub-groups for eggs of different species plus the standard 'for dietetic use' sub-group. Coding the latter as 2.4 to follow immediately the previous sub-group removes the option of adding codes in their logical position if code listings are ordered by the codes themselves. Standard end-of-group codes could be used and should be less prone to error. For example, the 'for dietetic use' sub-group could be routinely coded as n.99, perhaps with an 'others' sub-group as n.88. However the option of a 'Use context' descriptor facet discussed in Chapter 2 is considered a better option for recording dietetic use.

The first three sub-groups are defined by the egg-producing species, chicken, duck and quail. There is no provision for, or policy statement on, the coding of the eggs of other species.

Coverage could be extended, for example to turkey eggs, goose eggs and pheasant eggs. Although the inclusion of categories for clearly defined but uncommon foods has some advantages in coding, these could also result from a Miscellaneous sub-group supported by an effective cross-referencing system. Preferably the Eggs categories should use a similar subdivision to that for birds in the Meats group.

Cooked eggs can be coded using the descriptor system although some care may be needed. Use of the descriptor T4 describes boiled eggs. Eggs fried with fat will be T8, but fried without fat (as included in the U.K. food tables) may strictly require an alternative such as T10 (*Griddled*). Poached eggs might be assigned as T14 (*Poached*) or T17 (*Steamed*) depending on the method used. For scrambled eggs, no milk, the thermal treatment would might be considered as T10 (*Griddled*). A non-thermal term is also required to describe the state of mixing. Eggs scrambled with milk is an egg recipe.

Conclusions: The Eggs group should have extended sub-grouping to cover consumed eggs of other species, with provision for non-bird eggs. Use of the Descriptor system for the cooking of eggs should be reviewed and documented.

Core classification:

Egg and egg products	*Scope notes and example items*
Chicken eggs	Subdivided into whole, white and yolk
Turkey eggs	
Duck eggs	
Goose eggs	
Quail eggs	
Other bird eggs	e.g. of pheasant, gull, plover
Other eggs	e.g. turtle eggs

Main Group 3 : MEAT AND MEAT PRODUCTS

Overview: Early versions of Eurocode separated meat and meat products from poultry, game birds and game as two main groups, but these were later combined into main group 3. The sub-group level includes separate categories for the major meat species, generic categories for poultry, game and other game, and a meat products sub-group. The food item level is used for parts of the animal for the major meat species and poultry, and for individual species in the other, generic, sub-groups.

Review: Parts of animal are categorised to the meat cut level for beef and pork, although it has been suggested that this aspect needs to be improved. Also it is unclear why the same policy is not applied to veal and lamb for which the division is at the organ level. This also is not ideal since there is a separate item within the Meat products sub-group for Offals. The Eurocode 2 definition for offal may be overly restrictive since liver and kidney, *inter alia*,

will often be categorised as offal. Also, most offal might considered as a part of the animal rather than a meat product. Therefore it may be better to extend the present major-species:part-of-animal structure, supplemented where appropriate by an 'other offal' category, rather than to separate 'Offals' as a 'Meat products' item.

Use of a generic sub-group for poultry, sub-divided into parts of individual species results in no codes at the species level, for example for chicken. Having combined the main groups, it would seem appropriate to apply a consistent policy for the major species. This can be achieved by splitting the Poultry group into its constituent species, leaving the option to add codes for part of animal at the food item level.

If meat cuts (or poultry parts) and offals are defined as the items within an animal's sub-group, this does not allow for the recording of the consumption of carcase meat where the cut is unknown, but it can known not to be offal. This is perhaps where the limitation to two hierarchical levels within a main group has most adverse impact on Eurocode 2. The full requirement possibly involves four levels: type of animal (e.g. poultry), species (noting that beef and veal are distinguished), carcase meat or offal, and cut for carcase meat or organ for offal. Since the division between meat and offal is a simple two-way split, the best solution might be to have pairs of sub-groups such as 'Lamb meat' and 'Lamb offal'. Possibly a combined sub-group 'Poultry offal' would be sufficient rather than fully applying the subdivision to poultry species.

The designation 'game', implying 'wild' rather than domestically reared, may no longer be useful; a better option may be to create sub-groups for Other birds and Other mammals. This would be much more flexible in accommodating species such as ostrich and pigeon. Separate items could be included for reared and wild animals, for example wild duck, if considered necessary. The use of the term 'venison' is questionable since this is generic to the deer (Cervidae) family rather than just species in the *Cervus* genus, so the term should probably be 'Deer (*Cervus spp.*)'.

There is little indication of how preserved meats, ham and bacon should be coded. It is suggested that ham is assigned as 3.3.6, Pork leg, implying that a distinction is drawn between preservation of a meat cut and items which are classified as meat products. If this is the case, preservation descriptors (such as: P7, *Packed in aspic/gelatine*; P8, *Chemically preserved*; P9, *Cured/aged*; and P13, *Salted*) may need to be extensively used with meat cut categories. More specific information may be retained and coding kept simpler if preserved meats (retaining the integrity of the meat cut or organ) are assigned their own sub-group. This has been included in the proposed core classification, together with suggestions for its subdivision and example foods assigned to the subdivision. Possibly these individual subdivisions could be promoted to the sub-group level if it is considered useful to include more detailed food items.

A sub-group for Restructured meat and meat analogues has been added since these are likely to become increasingly significant and can be considered distinctly different from other Meat Products. Indeed non-meat analogues have been included in accord with the product type policy discussed in Chapter 4.

The classification of sausages and related products such as pâtès is difficult since different approaches can be taken to defining categories and often there will be borderline items which might be assigned to more than one category. The core classification takes a somewhat simplified approach based on product type, allowing other distinguishing features such as degree of homogenisation to be recorded using existing descriptor facets, e.g. non-thermal treatment, possibly with extra descriptor terms. To facilitate consistent coding, this should be based on an agreed authority look-up list of sausage and other meat product names rather than *de novo* coding on the basis of category definitions. The existing documentation which includes country indicators with sausage names provides an excellent basis for this.

Conclusions: The grouping for meats should be based on two types of meat sub-group. Main species should have their own groups, subdivided into items for parts of animal as considered necessary. 'Other' groups for mammals and birds would have species items or, if necessary, more specific items for the domestic and wild instances or possibly a species' offal. The core classification below removes horse, goat and rabbit/hare to the 'Other mammals' sub-group for convenience but they can remain as main species if this is considered more appropriate. It also applies the separation of carcase meat and offal discussed above. The proposed core classification gives preserved meats and more meat products explicit categories and modifies the classification of sausages. The explicit Meat Products sub-group could be removed to allow the promotion of some categories to the sub-group level, and perhaps the addtion of a Sausages sub-group.

Core classification:

Meat and meat products	*Scope notes and example items*
Beef, carcase meat	Cuts such as topside, brisket, possibly documented with pictures
Beef offal	Of calf, cow and oxen: liver, tongue, tripe, other offal
Veal, carcase meat	Leg of veal, veal (loin) chops
Veal offal	Liver
Pork, carcase meat	Tenderloin, chump, hock
Pork offal	Liver
Lamb, carcase meat	Includes lamb and mutton: leg, shoulder, best end of neck
Lamb offal	Lamb's liver
Other mammals	Horse, goat, rabbit, hare, boar, deer, kangaroo. Excludes marine mammals
Chicken	Breast, leg, wing
Turkey	Breast, leg, wing
Duck	Flesh

Goose	Flesh
Poultry offal	Chicken liver, duck liver, goose liver
Other birds	Pigeon, guinea fowl, pheasant, quail, ostrich
Preserved meats, ham and bacon	
Ham	Parma ham, sugar-glazed ham
Bacon	Smoked or unsmoked. Back bacon, streaky bacon
Preserved beef	Corned beef, pastrami, bresaola
Tongue (preserved)	
Preserved poultry	Smoked turkey, Spinkganz
Restructured meat and meat analogues	Reformed chicken, Textured Vegetable Protein (TVF)
Meat products	
Dry, smoked sausages (Rohwurst)	Salami-type sausages, Blockwurst, peperoni, saucisson fumè, Teewurst
Fresh and lightly cooked sausages (Bratwurst)	Sausage meat, Cumberland sausage, chipolatos, haggis, Frankfurters, black pudding, Blutwurst
Cooked sausages (Kochwurst)	Jagdwurst, Schinkensulzwurst
Pastes, pâtès and terrines	Beef paste, Liverwurst, pâtè de foie gras, duck terrine
Other meat products	Including meat products preserved as pieces rather than as the original cut, e.g. galantine, brawn, souse, meat loaves

Main Group 4 : FISH AND FISH PRODUCTS

Overview: The first sub-group accommodates 'Fish, miscellaneous' and the group has further sub-groups for Herring-type, Mackerel-type, Cod-type, Flat, Salmon-type, Carp-type and Perch-type fish. There are further sub-groups for crustacea and molluscs, and also for the sundry items of insects, reptiles and frogs. 'Fish products' and 'Fish products for dietetic use' complete the main group.

Review: The Eurocode 2 classification is based on the systematic classification of fishes but uses a common terminology for sub-group names, e.g. Herring-type and Mackerel-type. Some are at the Order level, e.g. Gadiformes (Cods), and others at the Suborder level, e.g. Salmonoidei (Salmons and trouts). The Perch-type fish may be restricted to the Suborder Percoidei (Perches) or include other members of the Order Perciformes. However

Scombroidei (Mackerels) is a Suborder of Perciformes, but some other Perciformes are included in the Mackerel-type sub-group.

Fish will generally be coded as species at the food item level and any coding of unknown species at the Suborder level would be liable to error. Thus the Suborder sub-groups only serve to group fish to aid recognition and possibly in data aggregation. The risk of misassignment in the classification possibly outweighs these advantages and thus the core classification defines sub-groups at the Order level, for example combining the Clupeoidei (Herrings) and Salmonoidei (Salmon and trout). Even at this levels, sources can differ. For example Pike (*Esox lucius*) can be assigned as a separate Order Haplomi or as Esocoidei within the Order Clupeiformes; its current categorisation as a Perch-type fish seems doubtful.

The current version of Eurocode 2 provides taxonomic species names for most items within the fish-type sub-groups, together with many synonyms. There are clearly ambiguities, for example Scad appears as a main name (4.1.16) and as a synonym (4.1.15) for two closely related miscellaneous fish. It is proposed that, unless exceptional circumstances, items in a Miscellaneous fish sub-group are only defined to the genus level (e.g. *Trachurus spp.*) or the family level (e.g. *Mugilidae spp.*). However for documentation purposes, more specific synonyms should be linked to the corresponding specific taxonomic name within the overall synonym list associated with the higher-level Eurocode term.

It is preferable that 'miscellaneous' or 'other' categories follow specific categories. The logical ordering of sub-groups needs to be independent of the group codes (for example to allow for insertions); this was discussed further in Chapter 2. Logical ordering of fish food items (for example grouping those for each Suborder together) within Order-based sub-groups would also help with the useability of the list of categories.

The Fish main group includes various 'guest' items such as whales, insects, reptiles and frogs. However it does not accommodate some more unusual marine foods such as seaweed, sea urchin and jellyfish products; a further Miscellaneous sub-group is proposed for these. A Preserved fish sub-group is suggested by analogy with the Meats group. It would be useful for named foods such as Kippers but otherwise use of the species item plus appropriate Preservation descriptor may be preferred. Alternatively the three categories shown within the Preserved fish sub-group of the core classification could be defined as separate sub-groups containing items for the fish species.

Similarly a sub-group for restructured fish and fish analogues is included. This is not intended for Fish Products such as fish cake and fish paste (although this is specified in the current Eurocode documentation) but is appropriate for Crabsticks; the sub-group may not (yet) be much used. The Fish Products sub-group differs from that for Meat Products in including roes and offals since part-of-animal is not covered in the main grouping.

Conclusions: The grouping for fish and the other organisms included in this main group is on the basis of the species (or higher-level taxonomic grouping). Since this does not incorporate part-of-animal, some differences from the Meats group are necessary but generally the treatment of meats and fish should be kept as compatible as possible, for example in the way that the categories of Meat Products and Fish Products are defined.

Core classification:

Fish and fish products	*Scope notes and example items*
Clupeiformes	Includes Clupeoidei (Herrings), Salmonoidei (Salmon and trout) and Esocoidei (Pikes)
Perciformes	Includes Percoidei (Perches) and Scombroidei (Mackerels)
Gadiformes	Cods including Burbot
Pleuronectiformes	Flat fish
Cypriniformes	Includes Cyprinoidei (Carps) and Siluroidei (Catfishes)
Other fish and marine mammals	Includes: Scad as *Trachurus spp.*; Tuna, etc. as *Thunnus spp.*; mullets as *Mugilidae spp.*
Crustaceans	
Molluscs	Including land molluscs (Snail)
Miscellaneous marine and aquatic foods	Seaweeds, echinoderms
Insects	
Reptiles	
Frogs	
Preserved fish	
Smoked fish	Kippers, smoked salmon, bloater
Canned fish	Canned sardine, canned tuna
Salted and pickled fish	Matjes herring, rollmop herring
Restructured fish and fish analogues	Reformed scampi, crabsticks
Fish products	Caviar, herring roe, fish pastes, fish cake

Main Group 5 : FATS, OILS AND THEIR PRODUCTS

Overview: The Oils and Fats group includes the major oils and fats as single foods, with the exceptions of margarine and blended vegetable oil which are considered mixed foods.

Review: The first sub-group is 'Butter', the dairy product being classified in this group on the basis of product type and usage. The food item level includes only 'Butter fat' (correctly, 'Butter oil'); 'Butter ghee' should possibly be added. Animal fats should include sheep fat; for example Suet is the fat surrounding the kidneys of beef or sheep. In this case, a product

type category might be better than those based on source animal.

Items in the Margarine sub-group (5X.2) are coded as generic mixed foods, the division being based on fat content and polyunsaturated fatty acid (PUFA) composition. Fat content is divided into ranges >80%, 50-80% and <50%. The first two of these are further split according to whether the PUFA content is greater than or less than 25%, whereas for fat <50% the PUFA division is between >35% and <35%. The PUFA percentages are based of the total fat content, not the total food weight, a fact which is clearly stated in the Rationale Document but appears to be missing from the Draft Manual.

Many of the food items coded in 5X.2 will not be correctly called Margarine and should be referred to as 'Fat spread'. Margarines themselves fall around the 80% fat mark and thus coding above or below will be arbitrary and liable to error. Very low fat spreads may merit a further subdivision, perhaps <30% fat. Also the selection of PUFA as the second criteria may not be ideal. Saturate content is more often clearly labeled. There is no item for 'Fat spread with olive oil' which is low in both saturates and PUFA since it is high in monounsaturates. Coding it as low in PUFA (the value being about 20%) may not recording the relevant information. Both PUFA and saturates variations may be less meaningful when the fat content is <45%.

The Compound fat/oil item (5X.5.23) should be named Compound (or Blended) vegetable fat/oil. There should be a separate sub-group for blends which include fats and oils from the other sub-groups. Apart from the routine 'Dietetic uses' sub-group, products do not feature in the group and thus it could be named simply 'Fats and oils' (the Products may refer to mixed foods coded to this main group).

Conclusions: There may be better options for subdivision in the Margarine sub-group and one possibility is included in the core classification below. Otherwise probably only minor refinements are necessary.

Core classification:

Fats and oils	*Scope notes and example items*
Butter	Butter oil, butter ghee
Margarine	Margarine, >25% saturates Margarine, <25% saturates
Fat spread	Fat spread, >65% fat, >25% saturates Fat spread, >65% fat, <25% saturates Fat spread, 45-65% fat, >25% saturates Fat spread, 45-65% fat, <25% saturates Fat spread, 30-45% fat Fat spread, <30% fat
Animal fats	
Marine oils	

Vegetable fats and oils	Palm oil, coconut oil, blended vegetable oils
Compound fats and oils	Mixtures incorporating animal, vegetable and/or artificial sourced materials

Main Group 6 : GRAINS AND GRAIN PRODUCTS

Overview: The basic organisation of the group is by grain source, with pairs of sub-groups for single and mixed products and an additional sub-group for non-bread wheat products. Breakfast cereals are assigned to a separate sub-group which is further subdivided on the basis of the grain involved, and there is a sub-group for mixed grain products.

Review: Codes for the grain/miller products, as single foods, and for breads and dishes, as mixed dishes are paired and differentiated by an 'X' indicating the latter type as generic mixed foods. For example, 'Barley, grain/miller products' has the code 6.4 and 'Barley, breads and dishes' is code 6X.4.; the third, food item, level is not used. The core classification significantly changes this approach by combining the pairs of sub-groups, e.g. to 'Barley products', using further subdivision into Barley flour, Barley breads and Barley Products (or individual products) at the food item level.

Wheat and rye are exceptions in that their sub-groups 6X.1 and 6X.3 are subdivided into differing bread items and have no other products (those for Wheat being in the separate sub-group 6X.2). Sub-group 6X.2 is named 'Wheat, grain/miller products, other use' to encompass a wide range of food items including pasta, pastry, pies, biscuits and cakes. Many of these items are very broadly based, for example 'Biscuits/wafers/cookies' form one item and Pasta has two, Pasta, egg-free' and 'Pasta, egg' (with no generic Pasta for use if the type is not known). Also, there is an error in the Draft Manual, with the code 6X.2.23 as Pancakes. This code is for Pizza, with Pancakes being 6X.2.24.

The contents of the present sub-group need to be separated out into new sub-groups so that more categories can be assigned at the food item level (and a wider range of aggregation options becomes available). The basis for modifying the sub-groups and the extent to which separate food items are included will need careful consideration. It has been suggested that baked goods should be classified on the basis of fat and sugar content. If this approach is adopted, it would be necessary to support coders with good documentation, for example look-up lists leading from food names known to consumers to the Eurocode category. The core classification proposal below introduces separate sub-groups for 'savoury' and 'sweet' foods, providing the opportunity to add the suggested more quantitative criteria for defining the sub-groups and/or their food item level terms. There will be cases where care is required to build a valid and understandable classification. For example, Rhurbarb is classified as a vegetable on botanical grounds but 'Rhurbarb pie' should be classed as sweet (akin to a fruit pie) rather than as savoury (as would be assumed if it were classed as a vegetable pie).

One reason for the large number of Wheat products categories is the precedence that the Grains main group takes over the other main groups, for example in including all pies. Since pies may make very significant contributions to the consumption of foods in other main groups, some indicator of ratio (less precise than a recipe which may not be known) would

be useful, perhaps in the Descriptor system.

A more precise definition of Breakfast cereal may be required. For example, Oatmeal may be classified as an Oat product or as a Breakfast cereal. As noted in the review of the Milk Product group, its coding may also vary according to how it is made up, either with water, milk or a mixture of the two.

Conclusions: Further work is probably needed to develop the coding of grain products and dishes, including bakery goods. This is particularly important for those items which are used for the consumption of foods from other groups (e.g. pies, pizzas) or which may be made or sold with considerably varying compositions (e.g. bakery goods with or without cream). Further levels in the classification hierarchy might be useful for bakery goods.

Core classification:

Grains and grain products	*Scope notes and example items*
Wheat flours	
Wheat breads	
Rye products	Rye flour; rye bread, dark; rye crispbread
Barley products	Barley flour, barley breads, barley products
Oat products	Oatcakes
Maize products	
Rice products and dishes	Rice flour, brown rice, Basmati rice
Millet products	
Buckwheat products	
Unripe spelt products	
Mixed grain products	
Breakfast cereals	Cereals, oats based
Pasta and noodles	
Pastry and pies	Choux pastry, meat pies, mixed pies (major fillings from >1 main group)
Savoury products and dishes	Savoury biscuits, savoury pancakes, pizza
Sweet products and dishes	Fruit cake, gâteau, Danish pastries, trifle

Main Group 7 : PULSES, SEEDS, KERNALS, NUTS AND PRODUCTS

Overview: This group includes dried pulses, seeds and nuts. It is used for soya products purporting to be dairy products or meat. Extracted oils are assigned to the Fats and oils main group.

Review: The main sub-groups are for pulses, seeds, kernals and nuts. The kernal sub-group is small, with relatively unimportant food items and might be better combined with the seeds sub-group.

The pulses sub-group needs careful review since it appears to be incomplete and to contain errors, at least based on U.K sources (Bailey, 1991; Holland *et al.*, 1991). For example, Black gram and Urd bean are given as synonyms for Mung beans, *Phaseolus aureus*. A correct synonym is Green gram, whereas Black gram is a synonym for the Urd bean, *Phaseolus mungo*. Several varieties of *Phaseolus vulgaris* are included as separate items; that for Brown beans is unrecognised but it has been suggested (Møller, 1993B) as being Pinto bean. Others are omitted both as items and synonyms, for example Black bean. This needs clear documentation since it could be confused with the Chinese black bean which is a variety of the soy bean, *Glycine max* (noting that this taxonomic name differs for that given in the Draft Manual which is *Glycine soja*). Lentils are not subdivided, perhaps because the variation is mainly in colour rather than form.

If all products of soy/soya bean (except its oil and soy sauce) are to be coded in the Pulses group, there will be an increasing need for a Pulse products sub-group. This is included in the core classification although an alternative approach to the coding of meat- and dairy-substitution products, in those groups on the basis of product type rather than on the source of the substitute is discussed further in Chapter 4. Nut products also should be considered for a possible sub-group. Peanut butter is a separate item, but there is little guidance on the coding of other products such as coconut milk, marzipan and indeed mixed nuts.

Conclusions: Some modification of the sub-groups may help, particularly in the coding of products, for example of soya bean. Work is also required on the food items and their synonyms.

Core classification:

Pulses, seeds, kernals, nuts and products	*Scope notes and example items*
Pulses	Soybean, dried peas, lentils, beans
Seeds and kernals	Linseed, beechnut seed, pine kernel (syn. pine nut)
Nuts	Peanut, hazelnut
Pulse products	Black fermented Chinese bean, soya milk, tofu, soya noodles, tempeh
Nut and seed products	Coconut milk, marzipan, nuts and raisins

Main Group 8 : VEGETABLES AND VEGETABLE PRODUCTS

Overview: This group includes vegetables consumed cooked or raw, and edible fungi. Vegetables are sub-grouped largely on the part of the plant consumed. A sub-group is included for 'Fruiting vegetables' to cover plant fruits used as vegetables.

Review: The main sub-grouping of vegetables is stated in the Rationale Document to be partly botanical but generally to be based on distinctions made for trade and commercial purposes. In practice this means that species are assigned to a sub-group which reflects the main consumed part of the plant, with other parts in the same sub-group as different items, for example Turnip shoots and Turnip tops in the 'Potatoes, other roots and tubers' group (8.4).

There are some improvements which could be made to the definition and naming of the sub-groups, and the assignment of food items to them. The distinction between 'Leaf/stalk vegetables' (8.1) and 'Leeks, onion, sprouts' group (8.3) is a difficult borderline to define, for example Chicory might be considered a 'shoot' (which is perhaps a better term than 'sprouts' which often refers to Brussel sprouts, 8.2.5). The 'Leeks, onion, sprouts' group (8.3) perhaps suffers from combining bulbous based vegetables with those used as their growing tips (shoots). Some indication of the use of 'Shoots, sprouts', 8.3.9, would be helpful. Separate items could be included for 'Bean sprouts' and 'Mustard and cress', the latter possibly to be included with 'Cress', 8.1.11, in the Leaf vegetable group. The taxonomic name for 8.1.11 has an error in the Draft Manual; it should read *Lepidium sativum*. Also, although it is probably convenient to combine onion and shallot (8.3.1), a separate item for 'Spring onion' might be useful.

Cabbages are assigned to a more botanically based sub-group, 8.2. This includes broccoli, cauliflower and Brussel sprouts, and might be better named 'Cabbage family' or 'Brassicas'. However this might be considered confusing with the Brassicas which appear as root vegetables (particularly as it creates another option for placing a 'Turnip tops' item).

Some clarification of the food items included for cabbages themselves is also necessary. Cabbages may be classified on two criteria, season and type (Bailey, 1991). The types are semi-hearted, green-hearted, hard white, and red. A further categorisation may be by shape, between roundhead and conical cabbage. Hard whites include Dutch and winter white cabbage. Spring greens are cabbages harvested before hearts form and should be considered a separate food item.

At present the number of sub-groups is relatively limited. Each currently has a reasonable number of associated food items, but the numbers could increase if there were a move to make coverage more comprehensive, for example through adding more items consumed by ethnic communities. Also some of the current collective groups might benefit from splitting. For example, it would seem useful to distinguish between roots and tubers to reflect differences in starch content.

Within the 'Fruiting vegetables' group (8.5) there are various issues relating to individual food items, their naming and their synonyms. Marrow does not appear; this may be included in its immature form, the courgette. The naming of peppers is imprecise; the main names would

be better as 'Sweet pepper'. Although Pimento can refer to both the green and red forms, 'Chilli pepper' might be a preferred name. Certainly 'Red pepper' should not be a synonym without further comment; it can equally well refer to a red sweet pepper. Some fruits eaten as vegetables appear in main group 9 as Fruits; these are noted under that section. Squashes and gourds may require subdivision since they are not all *Cucurbita pepo* varieties; indeed they should probably include Chayote (Fruit group 9.1.28).

It is presumably intended that pickled vegetables are coded as the vegetable, with the descriptor for *Pickled*, P20. In some cases it may be desirable to have additional basic items. For example, inclusion of Gherkins would allow the distinction to be made from Pickled cucumber (and may also be required for the vegetable itself). Pickling onion, as an immature form, is distinctly different from the usual onion and might also be added.

The listing of edible fungi omits many species, particularly those commonly used in oriental cooking. No clear way of sub-grouping edible fungi is evident (except perhaps by geographical region of origin) so a long list of items may be necessary.

A sub-group has been included for 'Vegetable salads' but this requires clearer definition as coders have used it for mayonnaise salads containing more than 60% mayonnaise (Møller, 1993B). The group could be renamed 'Vegetable mixtures' containing the existing category as an item named 'Fresh vegetable salads' defined as mixtures containing vegetables (and possibly lesser amounts of pulses, fruit or nuts) only, with dressing, etc. coded separately. Since a wide range of prepared salads may be purchased, with main ingredients from various different main groups, 'Prepared salads' could be assigned as a new sub-group in the Miscellaneous foods main group, sub-divided into items based on the group of their main constituent analogously to soups and sauces. Further items in the 'Vegetable mixtures' sub-group might be 'Mixed (boiled) vegetables' and 'Mixed stir-fry vegetables' which should be used even when Peas (as a pulse) form a significant proportion of the mixture.

Conclusions: Some revision of the sub-groups might be helpful, particularly where distinctions are clear, for example between tubers and roots. Although the assignment of some vegetables between leaf, stalk, shoot and bulb categories is likely to be arbitrary, the core classification takes these as separate sub-groups. An alternative approach would be to remove the distinction between shoots and stems, grouping them together and separately from leaf vegetables. State of maturity may be significant for some vegetables (and fruits, particularly those used as vegetables) and should be handled in a consistent way.

Core classification:

Vegetables and vegetable products	*Scope notes and example items*
Brassicas	Used for Brassica species grown for their heads (white cabbage), leaves (spring greens, kale), flowering heads (broccoli) or sprouts. Other species are classified as root vegetables
Leaf vegetables	Lettuces, mustard and cress
Stalk vegetables	Celery, Florence fennel, rhubarb

Shoot vegetables	Asparagas, chicory, palm hearts
Bulb vegetables	Leek, onion, spring onion
Tubers	Potato, sweet potato, cassava
Root vegetables	Carrot, turnip, beetroot, radish
Fruiting vegetables	Cucumber, gherkin, marrow, courgette
Edible fungi	Cultivated mushroom, shiitake mushroom, straw mushroom, truffle
Vegetable mixtures	Mixed salad, mixed vegetables

Main Group 9 : FRUIT AND FRUIT PRODUCTS

Overview: The Fruit group is subdivided by type of fruit, with sub-groups for Malaceous fruit, Stone fruit, Berries and Citrus fruit, although many fruit are consigned to a Miscellaneous sub-group.

Review: As with vegetables, the main sub-grouping of fruits is stated in the Rationale Document to be partly botanical but generally to be based on distinctions made for trade and commercial purposes. As noted in the review of the Fruiting vegetables sub-group (8.5) of the Vegetables group, some items which appear in the Fruits group are used as vegetables, for example Akee, Breadfruit, Jack fruit and Chayote. There is no item for Plantain, a cooking banana which may be eaten green as a vegetable or ripe; it is *Musa paradisiaca*. The taxonomic name for Banana (9.1.1) should probably be the more general *Musa spp.*

The other main issues regarding the Fruit group are the detail of the items listed, their taxonomic names and synonyms, and whether further items should be added. The term Mirabelle has been noted as a duplicate, but this has not been resolved; clarification of the plums and their synonyms will be needed when the core classification is extended to a full classification. It is probably helpful to have a comprehensive listing of fruit items so that less common terms are included and can be quickly located, rather than leaving the coder having to decide how to code an unknown item. Sample additions might include Physalis (*Physalis peruviana*, Cape gooseberry) and Nashi pear (*Pyrus pyrifolia*). 'Star fruit' should be included as a synonym for Carambola. There are quite a few cases where two names are given as the main name; it is preferable that one is selected and the other listed as a synonym.

A sub-group has been included for 'Fruit salads'. The group could be renamed 'Fruit mixtures' containing the existing category as an item named 'Fruit salads' and further items for canned 'Fruit cocktail' and 'Mixed fruit', the latter in particular for dried mixed fruit taking the descriptor for *Dried*, T5. The documentation notes that Raisins are coded as 9.4.1 (White grapes) plus descriptor (presumably *Dried*). This does not distinguish between raisins, sultanas and dried currants, which is perhaps reasonable and somewhat analogous to the question of whether White grapes and Black grapes should be coded together. A descriptor *Semi-dried* may be required for ready-to-eat dried fruit (e.g. apricots and prunes) to distinguish these from *Dried* forms rehydrated by cooking.

Conclusions: Most revisions to the Fruit group will result from a careful review of the food items to check that these are different fruits and that any synonyms are correctly assigned. The only modification in the core classification is generalisation of the Fruit salad sub-group to cover other mixtures.

Core classification:

Fruit and fruit products	*Scope notes and example items*
Malaceous fruit	Apple, pear, quince
Stone fruit	Apricot, cherry, olive, plum
Berries	Grapes, raspberries, currants
Citrus fruit	Grapefruit, lemon, orange
Miscellaneous fruit	Banana, date, kiwi friut, melon
Fruit mixtures	Fruit salad, fruit cocktail, mixed fruit

Main Group 10 : SUGAR, CHOCOLATE, CONFECTIONERY AND RELATED PRODUCTS

Overview: The group covers a wide range of products related to sugar, fruit preserves, and chocolate and other confectionery. It is composed of 19 sub-groups of which only 'Fruit jams and marmalades' is further subdivided, this by sugar content.

Review: A major question for a review of this group must be whether there is any advantage in subdividing the sub-groups further. Some of the sub-groups, for example 'Gum', 10X.11, cover only a few specific items whereas others such as 'Chocolate and chocolate goods, pralines', 10X.8, are very broad.

The first 4 sub-groups cover sugar and its substitutes. Sugar substitutes (10.2) covers both those with and without energy content; these could be separated at the item level. 'Glucose syrup', 10.4, might be better called 'Syrups' to include corn, golden and maple syrups, black treacle and molasses.

'Fruit jams and marmalades', 10X.6, is subdivided into items with total (not added) sugar contents of >50%, 30-50% and <30% as ascertained from European food tables (Rationale Document). The coverage of jams in these tables can be variable and possibly not adequate in some cases, for example for homemade jams and jellies. Jellies is an ambiguous term which here means preserves, normally after being strained, which contain no solid fruit residue. In some cases, e.g. 'Redcurrant jelly', these might be coded as a fruit-based sauce (12X.10.3) on the basis of their usage, but others (Blackcurrant jelly, Crabapple jelly) should be considered preserves. As such, it is more appropriate to classify them as 10X.6 rather than in the Jelly sub-group, 10X.5, which possibly should be reserved for jellies made up from concentrated setting agents (with fruit jelly taking the descriptor A7, *Flavouring, fruit*). However milk jellies, made up with milk and water, are coded as milk dishes.

The category 'Non-chocolate topping', 10X.7, may be difficult to define and to distinguish from alternative coding possibilities. For example, a topping with artificial chocolate flavouring might be coded here, with the descriptor A6 (*Flavouring, chocolate*). A topping made up with milk should probably be coded as a milk dish. The sub-group name might be more explicit as 'Non-chocolate dessert topping'. More fundamentally, the scope of this category needs to be defined either to be specific to toppings or to have a wider coverage. For example, currently it is used for coding Imitation cream although this has wider uses than implied by the category name. The coding of Imitation cream might be changed under the product type proposals of this report, but the classification of products used as toppings and fillings may remain difficult.

The 'Chocolate and chocolate goods, pralines' sub-group, 10X.8, covers a variety of products which might be subdivided. Categories created at the food item level would include Chocolate spread, Chocolate (as slabs, buttons, etc.), Chocolate-covered caramels and toffees, and Fancy chocolates (truffles, fruit cream and nut fillings, etc.). Chocolate covered bars and Chocolate covered ice cream bars are interrelated by brand name (e.g. Mars, Bounty) and can form separate items within the Candy bars sub-group (which might be better named Confectionery bars).

The sub-groups 10X.10 through 10X.18 mostly cover forms of non-chocolate confectionery, some of the categories being fairly specific and perhaps more appropriate to the food item level. The classification might be improved by creating sub-groups for 'Non-chocolate confectionery' and 'Sugar products'. The former would be reserved for products consumed as confectionery whereas the latter would be used for items such as marzipan which have a wider role. Various types of icing might also be included under Sugar products rather than as a Sugar mixed food (10X.1).

Some of the terms used in the confectionery sub-groups needs clarification. The original meaning of Praline is the same as that defined for Croquant, a non-chocolate confection. It is perhaps also now being used for chocolates which incorporate praline. The Gum sub-group would be clearer as the item 'Fruit and wine gums'. It is questionable whether Chewing gum is required at all since the main consumption is of the sweetener which may be nutritive or non-nutritive and could be coded directly. Nougat is a sweet made principally from sugar (possibly as honey or syrup) and chopped nuts, sometimes with egg white or candied fruit, and thoroughly aerated. The word can also, less commonly, be applied to the oil-cake made from the residue of walnut oil. The term Foam sweets needs a clear definition; it includes aerated products such as marshmallow and nougat. The entry for Liquorice would be better named as Liquorice confectionery. Sherbet was an Eastern cooling drink of diluted fruit juices. The term now has two distinct meanings, as a synonym for sorbet and as an effervescent fruit confection; the latter should be defined as an item of non-chocolate confectionery.

Conclusions: A restructuring of the sub-groups to reduce their number and to create food item level entries could give a better balanced and clearer classification. The core classification proposes a modified sub-group structure. When the item level entries are added, assignment policies may need to be developed further, for example in distinguishing between items assigned as Sugar mixed foods and those as Sugar products, and in deciding if chocolate takes preference, e.g. for chocolate-covered Turkish delight.

Core classification:

Sugar, chocolate and related products	*Scope notes and example items*
Sugar	
Sugar substitutes	Nutritive substitutes (e.g. sorbitol) Non-nutritive substitutes (e.g. saccharine)
Honey	Honey, honeycomb
Syrups	Corn syrup, maple syrup, black treacle, molasses
Fruit jams, jellies and marmalades	Plum jam, blackcurrant jelly, mincemeat, NOT redcurrant jelly
Jelly	Dessert (sweet) jellies with gelatine base and flavoured with fruit juice, wine or liqueur
Non-chocolate dessert topping	Tip Top, Dream Topping, fruit syrups
Chocolate and chocolate products	Chocolate spread, cooking chocolate, fruit and nut chocolate, chocolate covered caramels, truffles, Creme eggs
Confectionery bars	Chocolate covered bars, chocolate covered ice cream bars, other confectionery bars
Non-chocolate confectionery	Toffee, boiled sweets, fudge, nougat, sherbet sweets, confectionery (paste) jellies, Turkish delight
Sugar products	Icing, marzipan, candied fruit and nuts

Main Group 11 : BEVERAGES (NON-MILK)

Overview: The group covers alcoholic beverages, diffusions, juices, squashes and cordials, carbonated drinks, and waters. Beverages based on dairy products are classified in the Milk Products main group.

Review: The alcoholic beverages part of the group includes sub-groups for Beer and for Wine, subdivided by amount of alcohol and with a separate sub-group for Dessert wine. Beer is defined as malted and hopped alcoholic beverages including low-alcohol and alcohol-free products. Coding rules need to be clarified for mixtures such as Shandy, a mixture of beer and lemonade either retailed as such or mixed at the time of consumption. Two related points are whether the percentage of alcohol to be coded should be of the ingredient beer or of the final drink and a rule is required that determines that it should be coded as a beer rather than as a soft drinks. This is a case where the main ingredient must be selected from two major ingredients which are different types of food but which appear in the same main group.

Coding of recent introductions such as 'alcopops' (alcoholic lemonade-type drinks) and alcoholic milk drinks probably need to be considered as the development of new product types which may require modification of existing rules, for example on what constitutes a milk beverage to be coded in the Milk Products group.

Cider (together with perry, the pear equivalent) should be assigned a separate sub-group since it is distinctly different from wine in several respects compositionally and culturally. As a 'long' drink it is a different product type from wine.

Wine is defined as the fermentation product of grape juice and, since the subdivision is by alcohol level, no distinction is made between red and white, sparkling and non-sparkling, and sweet and dry. The exception to the latter is the separate sub-group for Dessert wine which is defined as non-fortified wine from grapes with a higher sugar content. There are several other aspects associated with wine which require clarification and possible modification. Low-alcohol and alcohol-free varieties probably need a more specific classification than as <9% alcohol; a category for <5% alcohol would accommodate a distinct set of 'light' products and one for <1% might also be included. Any decision should be based on a statement on the objective for subdividing wines which also covers the separate treatment given to Dessert wine, for example whether alcohol content, sugar content or consumption context is the main classifying feature. This is needed to define a cut-off point for wines that should be coded as Dessert wines, for example in the sequence down from Trockenbeerenauslese through to Spatlese. The definition of wine based on fermentation of grape juice may be too specific since it excludes any wines based on the fermentation of sugars added as sugar itself, as raisins or through an alternative source, as may be the case with home-made wines.

The classification of non-alcoholic beverages might be improved by decreasing the number of sub-groups, in some cases using the food item level if further subdivision is required. The present groups 11.8 through 11.12 might be replaced by sub-groups for 'Non-dilution drinks' (generally but not necessarily carbonated), 'Dilution drinks' (which might be adequately covered by the title 'Squashes and cordials'), and 'Water'. The first of these three might be subdivided into 'Cola drinks' (with extract of *Cola nitida* nuts as a significant ingredient) and 'Non-cola carbonated drinks' if required. Water could be subdivided into tap water and the items 'Still spring water', 'Carbonated spring water', and possibly 'Mineralised water' if it is felt useful and a suitable separation from ordinary spring waters can be defined. Carbonated water might alternatively be recorded using a new Component added descriptor. The term bottled is perhaps best avoided as the water might be distributed in a can. If the container is considered important here or in other coding situations, a set of descriptors for Container should be defined.

Tea, coffee and cocoa are infused beverages, with the assumption of a particular biological species; these could be combined at the sub-group level. Provision should be made for infusions of other species since the overall policy appears to suggest that these should be included in the Beverages group. They include a range of herb teas and dandelion (root) coffee. Possibly 'Coffee and chicory essence' should also be included.

The list of fruit juices has several omissions including cranberry juice, lime juice, mango juice, passion fruit juice and pomegranate juice.

Conclusions: Possible modifications to the sub-groups have been included in the core classification. Further work is required to improve the definitions defining categories at the food item level, e.g. for Dessert wines, to add further items (e.g. juices), and to define coding rules for mixed drinks and new products.

Core classification:

Beverages (non-milk)	*Scope notes and example items*
Beer	Alcoholic beverage prepared from malted cereals. Also includes barley beer/wine
Other alcoholic long drinks	Cider, perry, alcoholic ginger beer
Wine	Subdivided by alcohol content
Dessert wine	Wines from grapes with high sugar content
Liqueur/fortified wine	Port, sherry, madeira, marsala
Cocktails	Bloody Mary, Screwdriver
Liqueurs	Advocaat, cherry brandy, Cointeau, cream liqueur
Spirits and brandy	Gin, whiskey, vodka
Non-dilution drinks	Non-cola carbonated drinks, colas, mixers, non-carbonated lemonades
Dilution drinks	Squash, cordial
Infusion drinks	Tea, coffee, cocoa, herb teas
Water	Tap water, still and carbonated spring water, mineralised water
Vegetable juice	Carrot juice, tomato juice, mixed vegetable juice
Fruit juice	Apple juice, cranberry juice, orange juice
Vegetable nectar	Diluted vegetable juice
Fruit nectar	Diluted fruit juice
Other juices	Coconut milk, clam juice

Main Group 12 : MISCELLANEOUS FOODS

Overview: This group is used for those foods which do not fit conveniently into the other groups, either because they do not belong to an appropriate group (e.g. for salt) or because assignment of mixed foods to a correct specific group would split foods which are conventionally grouped together, for example soups and sauces.

Review: Many of the sub-groups are single items, for example tomato ketchup, salt and vinegar, which can be considered related and could be treated as separate items within a single sub-group. Providing this additional structure could make the Miscellaneous group easier to use and allow a more logical insertion of new items.

Definitions in the Draft Manual for Tomato ketchup, Sauce and Seasoning do not explain why tomato ketchup is not classified as a sauce or salt as a seasoning. In contrast to ketchup, Worcestershire sauce is considered a sauce. It may be helpful to introduce a sub-group such as Condiments and seasonings. Any dividing line between sauces and condiments (and also between condiments and herbs and spices) will be to some extent arbitrary, but may be an improvement on defining a larger number of unrelated sub-groups for similar items.

All soups are brought together in the Soups sub-group, 12X.9, and all sauces in the Sauces sub-group, 12X.10, subdivided by the type of food on which the individual soups and sauces are based. The Draft Manual documents the subdivision using examples but general guidelines need to be formulated so that the correct base ingredient can be readily identified. These guidelines also need to cover cases where major ingredients are from different groups, as in 'Chicken and leek soup'. Savoury snacks, 12X.15, are similarly subdivided on their main constituent.

The Mayonnaise sub-group, 12X.11, is subdivided on the basis of the percentage of oil. Whether this (with some implication of a volume measure) is better than expressing in terms of fat content probably depends on whether it was homemade (recipe information) or purchased (label information). The Salad dressing sub-group, 12X.3, could be subdivided in a similar way since the fat contents vary considerably (Chan *et al.*, 1994), even excluding low fat varieties which might be considered dietetic use. General policies for the group indicate that yogurt-based dressings should also be coded here, although these fall outside the manual's definition as they are not oil/fat-based. Mayonnaise and salad dressing (vinaigrette) are cold sauces, with egg and oil base and vinegar and oil base respectively. It may not always be possible to differentiate these from items in the Sauces sub-group and other composite sauces.

As discussed in the review of the Vegetables main group, it is proposed that a new Miscellaneous foods sub-group is created for mixed salads made up with mayonnaise or dressing and often purchased retail. The sub-group, called Prepared salads, would be subdivided according to the base constituent in a similar way to the soups and sauces. Base constituents would include salad vegetable, cooked vegetable (e.g. potato salad), grain (e.g. pasta- and rice-based salads), fruit, nuts, meat, fish, etc.

Conclusions: The Miscellaneous foods main group covers a range of ingredients, condiments, etc. together with mixed foods such as soups and sauces which it is preferred to group together rather than by their predominant constituent. The current classification assigns many individual ingredients and condiments at the sub-group level, but the core classification attempts to group these more logically. It also introduces a new set of mixed foods, the prepared salads.

Core classification:

Miscellaneous foods	*Scope notes and example items*
Non dairy coffee creamer	
Baking goods and other ingredients	Yeast, baking powder, cornflower, arrowroot, custard powder, gelatine
Spices and herbs	Cloves, coriander seeds, curry powder, paprika, sage, thyme
Condiments, seasoning and extracts	Salt, mustard, vinegar, tomato ketchup, Worcestershire sauce, beef stock cubes, yeast extract
Salad dressing	Vinegar and oil based cold sauce. Subdivided on fat or oil content
Mayonnaise	Egg and oil based cold sauce. Subdivided on fat or oil content
Soups	Subdivided on base constituent, e.g. Soup, vegetable base
Sauces	Subdivided on base constituent, e.g. Sauces, vegetable base. Note, Redcurrant jelly is Sauces, fruit base
Prepared salads	Subdivided on base constituent, e.g. Prepared salads, cooked vegetable base
Savoury snacks	Subdivided on base constituent, e.g. Savoury snacks, potato base

Main Group 13 : PRODUCTS FOR SPECIAL NUTRITIONAL USE

Summary and review: This group includes products for dietetic use that are not normally regarded as foods, for example supplements administered as tablets, capsules, etc. Foods modified for dietetic reasons are classified in the sub-group "for dietetic use" which appears in each main group (but not in the core classification as it is proposed to handle this aspect through a 'Use context' descriptor). The group also includes baby foods. The subdivision of these appears to omit soya-based infant formulae.

Core classification:

Products for special nutritional use	
Enteral foods	
Fat-modified foods	
Protein-enriched foods	
High-carbohydrate products	
High-energy products	
Low-energy products	
Carbohydrate, protein or fat-rich products	
Vitamin/mineral products/tonics	
Baby foods	

Chapter 4 : CONCLUSIONS AND RECOMMENDATIONS

This chapter presents conclusions from the review of the Eurocode 2 food coding classification and the preparation of the core classification, and makes some recommendations on the short-term and longer-term development of the overall Eurocode system.

The Eurocode 2 main classification system consists of terms in a shallow hierarchy for categorising food items as consumed on the basis of biological source, or of recognised basic product for milk products, beverages, etc. Rules are defined for assigning codes to mixed foods and more information on recipes for mixed foods may be held in a record containing details of the ingredients. The Descriptor system is available for recording information on further aspects of a consumed food such as the cooking method. Another key element of Eurocode is the documentation which already has a range of sections which document and explain the system. These constituent parts of the Eurocode system were discussed in Chapter 2 and some difficulties with their current versions were identified.

The present chapter proposes how Eurocode might be developed to remove problems which have been raised in this report and in the earlier evaluation, with particular emphasis on defining the principles for taking coding decisions and on building the various components of the system into an effective integrated solution for recording information on foods as consumed.

Development of underlying policy

The Rationale Document and the Draft Manual include policy statements as the basis for various aspects of the design and use of the Eurocode 2 coding system. There are areas in which clarification, additions and modifications to these policies would help coders to make appropriate and consistent decisions, but they are also (and more urgently) required to place any modifications to the system on a sound basis. The present review has identified the following as areas of design and coding policy which need final consideration and agreement.

Classification by source and product type: The Eurocode main groups are primarily subdivided into sub-groups either according to biological source or product type, as noted for each group in Chapter 3. Further subdivision may be on a similar basis (e.g. Cheeses into types also incorporating fat content) or on a different basis. Part of animal or plant is used for the major meats, some vegetables and in defining the edible part of nuts. Product types, for example soups and sauces in the Miscellaneous Foods group, are subdivided on the source type of the main ingredient. In some cases, the primary approach to subdividing main groups can leave distinct sets of foods unaccommodated, resulting in the addition of categories on a different basis. Examples include the sub-groups for Meat Products, Vegetable salads, etc. This is rarer at the lower, food item level since these might be coded as a non-specific match at the higher, sub-group level, although the inclusion of Peanuts and Peanut butter could be considered an example.

A further complication arises because the definition of the main group itself may (either explicitly or through the rules applied) be based on a different criterion from its primary subdivision. In particular this applies to Milk Products where specific non-animal products (e.g. Soya milk) are excluded but others may be allowed, coded as Cheese substitute. Because a primary consideration should be consumer recognition and recall, and because of

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the increasing use of substitutes for the major constituents of processed dishes, it is suggested that product type should be given precedence over the source.

As well as dealing with the increasing significance of substitute products, a well-defined policy would be very helpful in defining where Products sub-groups should appear and the categories that they should cover. Products sub-groups should be allowed in all the Source-based main groups and should be considered a type of sub-group, allowing more than one Product-type sub-group to be defined in a main group. For example, the Meat Products sub-groups might include Sausages, Meat pastes and Restructured meat. However precedence of the product type aspect determines that milk products, beverages and miscellaneous products (which will need careful definition, for example for pickles and sauces) will appear in these main groups rather than Product-type sub-groups of Source-type main groups.

This proposal amounts to a significant modification to policy which needs to be discussed and refined. It also would result in shifts between main groups; for these reasons the policy has not been incorporated into the current proposals for the core classification. However it is considered that the development and application of such a policy will enable a more consistent classification to be defined which can accommodate the range of new food products which are likely to become available in the future.

Descriptor for 'Use context': In the review of the Descriptor system in Chapter 2, the possible replacement of the sub-groups "for dietetic use" by a 'Use context' facet was discussed. Its use would result in a significant decrease in information loss when a food has to be coded as used for this purpose and would provide the opportunity to record further information about the consumption of a food. The extent of its coverage needs to be considered, for example it might include place of consumption, religious requirement (e.g. Kosher) and product positioning (e.g. for claims such as 'low fat' which may need clear distinction from the 'Components added' and 'Components removed' facets).

Integration of the Eurocode components: Although the Descriptor and National Recipe systems have been considered as parts of Eurocode for some time (see, for example, Arab *et al.*, 1987), they have been described in detail only relatively recently, as in the Draft Manual documentation. Otherwise the emphasis has been on the development and implementation of the Eurocode 2 hierarchical classification. This has been considered a self-contained system that is supplemented by the descriptor and recipe systems if needed. As a result the classification handles some aspects, such as dietetic use as noted above, that might be more flexibly handled through the Descriptor system.

Also, with respect to the handling of mixed foods, additional guidelines on the choice between using a single mixed-food code, a recipe file, and coding as the individual constituent items should be developed. However these may require some modification of current policies, for example to define how ingredients not in a state as consumed should be coded. Recipe files might also be better integrated if they are not solely organised on a national basis. Their categorisation should be based on a 'locale' combining cultural background and place of production with place of consumption. There should also be additional options for the citing of recipe details, e.g. national food tables, as noted in Chapter 2. These enhancements are needed to handle recipes more flexibly within countries, e.g. for ethnic groups and different types of restaurant, and for products traded between countries. Another area of recipe handling that might be developed further is that of recipe variants. The

potential problem of holding independent recipes for the same dish made with variant ingredients, e.g. different types of milk, was discussed in Chapter 2; the possible features of an enhanced approach should be investigated. The specification of such enhancements should be undertaken in parallel with the further development of guidelines on the handling of mixed foods and dishes in an integrated Eurocode system.

The handling of specific food names, including trade names and brand names, should also be considered part of an integrated approach to supporting users of the coding system. These represent synonyms (or, usually and more precisely, narrow terms) for a thesaurus which links them to categories in the Eurocode 2 classification. This would in effect form the basis for an implementation of Eurocode 1 as a support tool for coding.

A policy of integration as an overall objective should enable ongoing modifications to Eurocode to be based on consistent criteria in determining whether they should be implemented through the Eurocode 2 classification, the Descriptor system, recipe support or thesaurus support. Together with clear guidelines for assigning Eurocode 2 categories as discussed earlier in this section on policies, this should allow Eurocode to develop and evolve towards a highly functional and user-friendly approach to coding food consumption data.

Development of the Eurocode 2 classification

Eurocode 2 hierarchical structure: Generally the hierarchical classification enables suitable categories to be defined. Where the ideal analysis requires more levels, preference should be given to those levels most likely to be identified in consumption reports, e.g. meat for a species rather than more general categories (such as Poultry) or more precise categories which may not be reported (such as Chicken leg). The constraint on the number of levels in the hierarchy arises from the wish to limit the complexity of codes. If suitable computer coding support systems are implemented, the coder will not need to handle codes directly and thus the contraint will be removed. Computer systems might use a code capable of supporting more levels, mapping from (and possibly to) the existing codes.

The level at which foods can be coded in the present version of the system is at times uneven, partly as a result of the hierarchy limitation. For example, because Milk Products is classified as a main group, there are two further levels for defining these in more detail. On the other hand Soya bean is at the food item level, leaving no scope to subdivide soya products. Instead diverse products such as soya milk, soya flour and textured vegetable protein are coded at Soya bean flagged as a mixed food. For some purposes this may be an unacceptable loss of information which could be resolved by the use of an extended hierarchy. Within the existing hierarchical structure, the proposed core classification adds some Products sub-groups in parallel with source-based criteria. This leaves the options open between extending the hierarchy and implementing parallel classifications of source and product type.

Implementing an extended hierarchy while maintaining a mapping to a system with the current structuring would bring several advantages. In many cases it would allow the coding of more specific information while retaining the ability to code at intermediate levels of specificity. This will simplify coding and reduce information loss since it will more often be possible to record items as they are reported. The hierarchy can be more detailed to allow for various levels appropriate for recording and for data aggregation. It will also provide a logical background against which to take decisions on assigning categories within a restricted

version of the hierarchy retained for compatibility with current implementations of Eurocode. The core classification, presented for each main group in Chapter 3 and discussed further below, provides an initial step by forming a suitable basis for a restricted hierarchy which can be expanded (by the addition of both intermediate levels and extra lower levels) into the extended hierarchy.

The core classification: The core classification developed in this work should be seen as a proposal for the next step in the evolution of the Eurocode 2 classification. Based on the review of each main group documented in Chapter 3, it proposes modifications to their sub-groups in accord with the policies discussed earlier in this chapter. Since the policies are at this stage suggestions, the core classification does not define a final structure for the classification categories. Instead it starts the evolution process by resolving particular difficulties with the current classification in ways which are compatible with the policy proposals.

The original proposal for this work envisaged that the core classification would disregard the current hierarchical limitation discussed above, leaving the shoe-horning of the resultant multi-level core back into the Eurocode 2 structure to a later stage. In fact only a limited number of cases were found where extra hierarchical levels needed to be added to the existing structure at the sub-group level. The extra levels were discussed in the review of the groups, the major examples being in the Meats group, but the current proposals for the core classification use the limited structure. As a result there are cases where extra implicit hierarchical levels can be considered to exist, for example an implicit category of Beef above the sub-groups of Beef, carcase meat and Beef offal. The core classification forms the basis for a modified classification within the current hierarchical structure. These modifications should help in developing an effective mapping between the limited hierarchy and any future extended hierarchy, allowing users to migrate between the two options (with some information loss in moving from the extended to the limited hierarchy).

Apart from the proposed modifications to the Meat group, the main structural modification has been the addition of extra Products sub-groups. This allows the creation of more specific categories at the food item level than is possible when these sub-groups are not available. The specific items in the Products sub-groups should be defined so that they will attach to biological origin sub-groups or items in the extended hierarchy. For example, the category Pulse product/soya milk might become Pulses/soya beans/soya milk. Some policy decisions on the definition of products will arise, for example whether raisins should be considered a grape product or Grapes plus the *Dried* descriptor. The former provides advantages since it will be possible to differentiate the specific products raisins, sultanas and dried currants. In this case a coding support facility might enable the coder to make the selection on the basis of a 'Dried fruit' sub-group category, the items of which incorporate the *Dried* descriptor.

Some additions or other minor adjustments have been made where the current categories do not differentiate significant subdivisions of foods (sometimes as extra divisions where a systematic subdivision has already been established) or in response to specific comments on coding problems. The core classification listings in Chapter 3 and Appendix A give sample categories at the lower level(s), in particular changes or additions to the existing Eurocode classification where these are considered necessary. They also include some scope notes where the category name is not considered adequately explicit. The scope notes for sub-groups should be extended during a review of the food item level categories.

Enhanced documentation and coding support

There are various sections of documentation in the Draft Manual, both in the main body and in appendices. These form the basis for effective and comprehensive documentation but a considerable amount of work is required to achieve this, both directly on the text and in formulating clearer policies and consistent explanations. The latter can only be achieved by considering Eurocode an integrated system, for example when the coding of fried foods is discussed (Draft Manual, p. 12), the use of the descriptor *Fried* must be mentioned. There are several other cases where the Draft Manual includes examples and statements of alternative options to illustrate particular points without noting all the relevant considerations for selecting the best (or most appropriate) coding option.

The current listing of the classification with synonyms and the separate list of food definitions should be built into a carefully designed thesaurus. This should accommodate a range of types of term, relationships between them, and scope notes about them. Narrow terms, perhaps approaching the Eurocode 1 level, should be linked to Eurocode 2 categories. Clearly identifiable sub-sets should relate to terms used in particular geographical locations, cultural environments, etc. Also, thesaurus entries could be of differing status such as official, proposed, authorised for a particular country or survey, etc. This indicates that the thesaurus collection should be managed as a database, possibly with a range of output options including printed listings and HTML files. Use of the latter would support cross-reference links to related information and could be used locally in Web browsers as well as providing for remote access over the Internet to the authoritative set of up-to-date documentation.

The core classification does not list codes, just named categories. These are linked to storage codes but the overall approach implies that coding will normally be performed with computer support. The core classification file also includes sort codes for maintaining the logical order of categories within a group. This parallel development of the information content and the data management facilities should be continued as the Eurocode system is enhanced. This should ensure that an effective and practical coding environment is available to support new releases of the system.

The requirements for an effective coding support system need to be specified. They will be determined by two main considerations, the features of the food coding language and aspects relating to the consumption data that are to be coded. The design of the thesaurus must be based on the requirements for it to provide coding support. Also the system should facilitate efficient coding through facilities suited to the incoming consumption data. For example alternative coding interfaces may be required for the various survey methods. Features might include the ability to define or adapt temporary recipes for coding the consumption of individuals, for example quantifying beverages and breakfast cereals taken with milk and/or sugar. It may be possible to specify these aspects on the basis of existing coding support systems.

Further development

In this report various developments have been identified as having the potential to enhance the Eurocode system, broadly divided into those of policy, those for the different parts of the system (Eurocode 2 classification, Descriptor system, Recipe system, etc.), those involved in integrating the system, and those involving documentation, presentation and coding support. There are also organisational implications although detailed discussion of these is considered beyond the scope of this report.

This section proposes a list of actions in an approximate chronological order that will allow Eurocode to be developed and to evolve into an increasingly effective system for recording food consumption information.

- » Obtain and incorporate feedback on the core classification and its implications for policy in defining Eurocode 2 classification categories
- » Restate the objectives of the overall Eurocode food coding system, for example the requirements for matching consumption records with food composition data
- » Formulate an integrated framework based on the Eurocode 2 classification, the Descriptor system and other components that will meet the objectives, determining what information on consumed foods will be supported through each component of the system
- » Having thus specified the information to be managed through the classification component, further review the core classification and its coding policies
- » Design the classification thesaurus
- » Complete the review and updating of the Eurocode 2 classification on the basis of the current hierarchical structure, and build an initial version of the thesaurus
- » Review and extend the Descriptor system to meet its objectives
- » Specify and document the Recipe file information content
- » Build overall coding documentation to complement the thesaurus
- » Prepare other coding support tools.

Conclusion

The Eurocode 2 classification and its associated features such as the Descriptor system provide the basic components for a system to record information on foods consumed. The implementation documented in the Draft Manual may meet the objectives of particular studies but for the system to be more widely adopted it must meet a set of broader and well-defined requirements. Participation by potential users in the specification of these requirements, for example by the preparation, circulation and discussion of a concise requirements document, should encourage the adoption of the resultant enhanced Eurocode system.

The key to a successful enhanced Eurocode system is seen as being the balanced development of the various components within an integrated framework. Recording food items as categories within a single classification hierarchy generally has the potential to lose information that in particular contexts might need to be retained. The other components must be designed to record the information not supported through the main hierarchy. Some of the components, for example the Descriptor system, may be essential for most implementations while others might only be required to meet specialist requirements. Clear documentation of the objectives of each supporting component will help in defining the role and policies for

the Eurocode 2 classification.

The present initial review of the classification and the development of the proposed core classification has identified general directions and specific changes which should improve the coverage and useability of the Eurocode 2 classification. These should define the role of the classification in identifying the source and product type of a food, allowing the roles of other components to be developed to support the requirements for recording further information about the item. Further development of the documentation and thesaurus, and their incorporation into an effective coding support environment can also contribute to making the Eurocode system an effective solution for the coding of food consumption data and other food-related information.

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Appendix A : THE CORE CLASSIFICATION

Milk and milk products	*Scope notes and example items*
Milk	Liquid milks, including fortified, UHT and sterilised products, and reconstituted dried milk, subdivided on fat content. Also items for buttermilk, soured milks and condensed milks
Cream	Subdivided on fat content
Kefir	A fermented milk drink containing alcohol and carbonated
Yogurt	A product of lactic cultures acting on milk. Subdivided by fat content
Whey	Residue from milk after removal of casein and most of the fat as the curd
Other fermented milk products	Excluding kefir, fermented (i.e. alcohol-containing) milk products. Subdivided by fat content
Cheese	Subdivided by type (hard, soft, fresh) and, for each type, by fat content
Cheese substitutes	Imitiation cheese products in which part or all the milk fat is replaced by plant oils or other fat substitutes
Ice cream	Dairy and non-dairy ice cream and other frozen confections, e.g. water ices and sorbets
Egg and egg products	
Chicken eggs	Subdivided into whole, white and yolk
Turkey eggs	
Duck eggs	
Goose eggs	
Quail eggs	
Other bird eggs	e.g. of pheasant, gull, plover
Other eggs	e.g. turtle eggs

Meat and meat products	
Beef, carcase meat	Cuts such as topside, brisket, possibly documented with pictures
Beef offal	Of calf, cow and oxen: liver, tongue, tripe, other offal
Veal, carcase meat	Leg of veal, veal (loin) chops
Veal offal	Liver
Pork, carcase meat	Tenderloin, chump, hock
Pork offal	Liver
Lamb, carcase meat	Includes lamb and mutton: leg, shoulder, best end of neck
Lamb offal	Lamb's liver
Other mammals	Horse, goat, rabbit, hare, boar, deer, kangaroo. Excludes marine mammals
Chicken	Breast, leg, wing
Turkey	Breast, leg, wing
Duck	Flesh
Goose	Flesh
Poultry offal	Chicken liver, duck liver, goose liver
Other birds	Pigeon, guinea fowl, pheasant, quail, ostrich
Preserved meats, ham and bacon	
Ham	Parma ham, sugar-glazed ham
Bacon	Smoked or unsmoked. Back bacon, streaky bacon
Preserved beef	Corned beef, pastrami, bresaola
Tongue (preserved)	
Preserved poultry	Smoked turkey, Spinkganz
Restructured meat and meat analogues	Reformed chicken, Textured Vegetable Protein (TVF)
Meat products	
Dry, smoked sausages (Rohwurst)	Salami-type sausages, Blockwurst, peperoni, saucisson fumè, Teewurst

Fresh and lightly cooked sausages (Bratwurst)	Sausage meat, Cumberland sausage, chipolatos, haggis, Frankfurters, black pudding, Blutwurst
Cooked sausages (Kochwurst)	Jagdwurst, Schinkensulzwurst
Pastes, pâtès and terrines	Beef paste, Liverwurst, pâtè de foie gras, duck terrine
Other meat products	Including meat products preserved as pieces rather than as the original cut, e.g. galantine, brawn, souse, meat loaves
Fish and fish products	
Clupeiformes	Includes Clupeoidei (Herrings), Salmonoidei (Salmon and trout) and Esocoidei (Pikes)
Perciformes	Includes Percoidei (Perches) and Scombroidei (Mackerels)
Gadiformes	Cods including Burbot
Pleuronectiformes	Flat fish
Cypriniformes	Includes Cyprinoidei (Carps) and Siluroidei (Catfishes)
Other fish and marine mammals	Includes: Scad as *Trachurus spp.*; Tuna, etc. as *Thunnus spp.*; mullets as *Mugilidae spp.*
Crustaceans	
Molluscs	Including land molluscs (Snail)
Miscellaneous marine and aquatic foods	Seaweeds, echinoderms
Insects	
Reptiles	
Frogs	
Preserved fish	
Smoked fish	Kippers, smoked salmon, bloater
Canned fish	Canned sardine, canned tuna
Salted and pickled fish	Matjes herring, rollmop herring
Restructured fish and fish analogues	Reformed scampi, crabsticks
Fish products	Caviar, herring roe, fish pastes, fish cake

Fats and oils	
Butter	Butter oil, butter ghee
Margarine	Margarine, >25% saturates Margarine, <25% saturates
Fat spread	Fat spread, >65% fat, >25% saturates Fat spread, >65% fat, <25% saturates Fat spread, 45-65% fat, >25% saturates Fat spread, 45-65% fat, <25% saturates Fat spread, 30-45% fat Fat spread, <30% fat
Animal fats	
Marine oils	
Vegetable fats and oils	Palm oil, coconut oil, blended vegetable oils
Compound fats and oils	Mixtures incorporating animal, vegetable and/or artificial sourced materials
Grains and grain products	
Wheat flours	
Wheat breads	
Rye products	Rye flour; rye bread, dark; rye crispbread
Barley products	Barley flour, barley breads, barley products
Oat products	Oatcakes
Maize products	
Rice products and dishes	Rice flour, brown rice, Basmati rice
Millet products	
Buckwheat products	
Unripe spelt products	
Mixed grain products	
Breakfast cereals	Cereals, oats based
Pasta and noodles	
Pastry and pies	Choux pastry, meat pies, mixed pies (major fillings from >1 main group)
Savoury products and dishes	Savoury biscuits, savoury pancakes, pizza
Sweet products and dishes	Fruit cake, gâteau, Danish pastries, trifle

Pulses, seeds, kernals, nuts and products	
Pulses	Soybean, dried peas, lentils, beans
Seeds and kernals	Linseed, beechnut seed, pine kernel (syn. pine nut)
Nuts	Peanut, hazelnut
Pulse products	Black fermented Chinese bean, soya milk, tofu, soya noodles, tempeh
Nut and seed products	Coconut milk, marzipan, nuts and raisins
Vegetables and vegetable products	
Brassicas	Used for Brassica species grown for their heads (white cabbage), leaves (spring greens, kale), flowering heads (broccoli) or sprouts. Other species are classified as root vegetables
Leaf vegetables	Lettuces, mustard and cress
Stalk vegetables	Celery, Florence fennel, rhubarb
Shoot vegetables	Asparagas, chicory, palm hearts
Bulb vegetables	Leek, onion, spring onion
Tubers	Potato, sweet potato, cassava
Root vegetables	Carrot, turnip, beetroot, radish
Fruiting vegetables	Cucumber, gherkin, marrow, courgette
Edible fungi	Cultivated mushroom, shiitake mushroom, straw mushroom, truffle
Vegetable mixtures	Mixed salad, mixed vegetables
Fruit and fruit products	
Malaceous fruit	Apple, pear, quince
Stone fruit	Apricot, cherry, olive, plum
Berries	Grapes, raspberries, currants
Citrus fruit	Grapefruit, lemon, orange
Miscellaneous fruit	Banana, date, kiwi friut, melon
Fruit mixtures	Fruit salad, fruit cocktail, mixed fruit

Sugar, chocolate and related products	
Sugar	
Sugar substitutes	Nutritive substitutes (e.g. sorbitol) Non-nutritive substitutes (e.g. saccharine)
Honey	Honey, honeycomb
Syrups	Corn syrup, maple syrup, black treacle, molasses
Fruit jams, jellies and marmalades	Plum jam, blackcurrant jelly, mincemeat, NOT redcurrant jelly
Jelly	Dessert (sweet) jellies with gelatine base and flavoured with fruit juice, wine or liqueur
Non-chocolate dessert topping	Tip Top, Dream Topping, fruit syrups
Chocolate and chocolate products	Chocolate spread, cooking chocolate, fruit and nut chocolate, chocolate covered caramels, truffles, Creme eggs
Confectionery bars	Chocolate covered bars, chocolate covered ice cream bars, other confectionery bars
Non-chocolate confectionery	Toffee, boiled sweets, fudge, nougat, sherbet sweets, confectionery (paste) jellies, Turkish delight
Sugar products	Icing, marzipan, candied fruit and nuts
Beverages (non-milk)	
Beer	Alcoholic beverage prepared from malted cereals. Also includes barley beer/wine
Other alcoholic long drinks	Cider, perry, alcoholic ginger beer
Wine	Subdivided by alcohol content
Dessert wine	Wines from grapes with high sugar content
Liqueur/fortified wine	Port, sherry, madeira, marsala
Cocktails	Bloody Mary, Screwdriver
Liqueurs	Advocaat, cherry brandy, Cointeau, cream liqueur
Spirits and brandy	Gin, whiskey, vodka
Non-dilution drinks	Non-cola carbonated drinks, colas, mixers, non-carbonated lemonades
Dilution drinks	Squash, cordial

Infusion drinks	Tea, coffee, cocoa, herb teas
Water	Tap water, still and carbonated spring water, mineralised water
Vegetable juice	Carrot juice, tomato juice, mixed vegetable juice
Fruit juice	Apple juice, cranberry juice, orange juice
Vegetable nectar	Diluted vegetable juice
Fruit nectar	Diluted fruit juice
Other juices	Coconut milk, clam juice
Miscellaneous foods	
Non dairy coffee creamer	
Baking goods and other ingredients	Yeast, baking powder, cornflower, arrowroot, custard powder, gelatine
Spices and herbs	Cloves, coriander seeds, curry powder, paprika, sage, thyme
Condiments, seasoning and extracts	Salt, mustard, vinegar, tomato ketchup, Worcestershire sauce, beef stock cubes, yeast extract
Salad dressing	Vinegar and oil based cold sauce. Subdivided on fat or oil content
Mayonnaise	Egg and oil based cold sauce. Subdivided on fat or oil content
Soups	Subdivided on base constituent, e.g. Soup, vegetable base
Sauces	Subdivided on base constituent, e.g. Sauces, vegetable base. Note, Redcurrant jelly is Sauces, fruit base
Prepared salads	Subdivided on base constituent, e.g. Prepared salads, cooked vegetable base
Savoury snacks	Subdivided on base constituent, e.g. Savoury snacks, potato base

Products for special nutritional use	
Enteral foods	
Fat-modified foods	
Protein-enriched foods	
High-carbohydrate products	
High-energy products	
Low-energy products	
Carbohydrate, protein or fat-rich products	
Vitamin/mineral products/tonics	
Baby foods	

Appendix B : THE CORE CLASSIFICATION DATABASE

General format and content

The core classification has been delivered as a Microsoft Access database file, CORECLAS.MDB and as a tab-delimited text file CORECLAS.TXT. These contain the data in a single table holding records for the core classification categories. In addition to the category name, the record includes fields for the scope notes, the Eurocode 2 code, and sort keys to maintain the logical and Eurocode orders. There is a field giving the status of the Eurocode code for the category; this may indicate that the category is essentially unchanged from the existing definition, that the definition has been changed, or that it is a proposed new category.

Each category record has a sequentially assigned unique numeric identifier and these are used to hold the hierarchical structure. Each record has a 'Higher category' field that stores the identifier of the parent category, i.e. of the main group for a sub-group and of a sub-group for a food item. The field has a value of Null for the main group records.

In addition to the sub-group categories, the database includes a few cases of food item level records, for example for the Fat spreads. New Eurocode 2 codes have been included for new categories, but existing codes have been reused where possible for modified categories. In a couple of cases this has resulted in food item level codes appearing at the sub-group in the revised classification; whether these should be changed depends on decisions on future policies in respect of restricted and extended hierarchies as discussed in Chapter 4.

Database access facilities

The Access database includes several queries to demonstrate some options for listing the categories based on the stored data, including the sort keys. There is also a report which prints out a hierarchical listing of the codes and category names based on a query which extracts the necessary data from the data table.

Further development

The current data access facilities incorporated in the database are intended to demonstrate some basic possibilities for handling the data that might contribute to a coding support system. As discussed in Chapter 4, a key feature of the support should be a comprehensive thesaurus. Possibly the thesaurus, including the category names, would be handled as one or more separate tables to support multilinguality separate from the code and classification hierarchy. One interesting consideration is whether the classification hierarchy and the thesaurus broad and narrow term structure should be handled separately.

In addition to providing effective access to information on the Eurocode hierarchy and thesaurus, a coding support system must provide an effective interface for the input and coding of consumption data. The requirements for this need to be carefully researched.