

# Date Labelling

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## Diluting food safety indicators



Iglesias, M., n.d. Available at: <http://www.miglesiasart.com/liquids.html>  
(‘use by’ added by author)

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## Foreword

This report is the result of a 6-month research project carried out at the law & Governance department at Wageningen University. This thesis project is part of my Master in Food Safety, Food Law specialisation.

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## Abstract

Durability dates provide consumers with valuable information about the safety and quality of a food. Food is perishable and can become unsafe. Consumers cannot detect safety until after consumption therefore 'use by' dates act as safety indicators. Food businesses are responsible for the presence and accuracy of these dates. In practice, food businesses are taking an over-cautious approach to date labelling and have safety margins. Quality deteriorates before safety and as such 'use by' dates are linked to quality. 'Use by' dates are thus set further away from the food safety risks, diluting 'use by' dates as food safety indicators. The Food Information Regulation (Regulation (EU) No 1169/2011) deems food "unsafe" once the 'use by' date has passed. However, as 'use by' dates are set where quality begins to deteriorate food will be declared unsafe by legal definition.

## Chapter 1: Introduction

### 1.1 Research Background

Food is perishable and as such has a limited shelf life. Date marking provides an indication of the durability of a product. Food reaches the end of its shelf life when it becomes injurious to health or when its quality attributes have deteriorated to such an extent that it becomes unfit for human consumption. Date marking indicates when food is safe to eat and when it is at its best (Local Better Regulation Office 2011). The safety of a foodstuff generally cannot be detected until after consumption. Date labels protect consumers from food safety risks by providing valuable information about the safety of a product. There are two date indicators applied to food in the European Union (EU); the 'use by' date and the date of minimum durability. The 'use by' date is a guarantee from the manufacturer that if properly stored the product is safe up until that date. This date relates to when the product can become unsafe and constitute a danger to human health. It is forbidden for products past the 'use by' date to be on the market and products should not be consumed once this date has past. The 'best before' date indicates until when the product is at its best. Products with an expired 'best before' date may still be sold. Consumers can use their organoleptic senses to determine whether the product is still good to eat.

EU Regulation No 1169/2011, otherwise known as the Food Information Regulation, requires mandatory date marking of most foods. The Regulation requires either the 'use by' date or the date of minimum durability to be applied to foods. The 'use by' date should be present on foods which from a microbiological point of view are highly perishable and are therefore likely after a short period to constitute a serious risk to human health. As such, the purpose of the 'use by' date is to draw attention to foods which pose a greater risk of foodborne illnesses (Local Better Regulation Office, 2011). This is reinforced by the additional requirement that products which exceed their 'use by' date are deemed to be "unsafe" by definition and are therefore forbidden to be on the market.

Food businesses are responsible for the presence and accuracy of these dates (Regulation (EU) No. 1169/2011 Article 8(2)). The food business operator (FBO) responsible for the food information is the operator under whose name or business name the food is marketed or, if that is not established in the Union, the importer into the Union market (Regulation (EU) No. 1169/2011 Article 8(1)). In order to fulfil the date marking requirements the FBO must determine; (1) whether a food product requires a date of minimum durability, a 'use by' date or is exempt, and (2) what the durability of the product is. Although the Food Information Regulation provides some guiding principles it does not specify how a food business should determine the durability of a product. This is left up to the food business. In order to ensure compliance with the date labelling requirement food authorities and the food industry must interpret this requirement and other relevant provisions. The interpretation of which will influence how these requirements are implemented in practice.

A literature review suggests that there are limited studies on how date marking is carried out in practice. There is evidence to suggest that there is variation in the way 'use by' dates and 'best before' dates are applied (WRAP 2011). One study found that two date indicators were being used for almost identical refrigerated products in supermarkets (WRAP 2010). Yet, these date indicators, from a legislative point of view, communicate two different messages: a safety risk and a loss in quality risk (WRAP 2011). In addition, setting dates is complex as a number of factors can influence

which date indicator is used and the actual date indicated. These factors include the ‘manufacturing process, handling and storage within the supply chain, microbiological risks, composition including food additives, quality and brand reputation’ (Local Better Regulation Office 2011, p.11). The desire to protect quality, reputation, avoid product recalls and ensure food is safe to consume leads food businesses to take an over-cautious approach to date labelling (Local Better Regulation Office 2011). This may be in the form of applying a ‘use by’ date to products which have a low microbiological food risk and/or having a ‘safety margin’ (Local Better Regulation Office 2011).

## **1.2 Problem Definition**

Date marking was initially introduced as a stock management system to inform retailers of the freshness of products. Overtime, date marking has progressed to a consumer protection mechanism and later to a food safety device. The safety of a product is not visible to the consumer. A legal requirement was introduced to indicate the shelf life of a product with a ‘use by’ date or a date of minimum durability. The ‘use by’ date indicates the safety of a product. It is the FBO’s responsibility to provide an ‘appropriate durability indicator’ and an ‘appropriate shelf life’ (European Parliament 2013). However, setting a shelf life date is complex, influenced by many factors, which can lead to an overcautious approach being taken. This can be in the form of applying a safety margin on a shelf life date. Regulation (EC) No. 1169/2011 declares an expired ‘use by’ date to be “unsafe” in the meaning of Article 14 of Regulation (EC) No. 178/2002. Yet, if food businesses are setting dates overcautiously then deeming a product to be “unsafe” is legal fiction and not based on reality as the product is not “unsafe”. This provision may lead products to being deemed “unsafe” by legal definition.

## **1.3 Research Objective**

The objective of this research is to explore whether the date labelling requirement is an effective tool for indicating end of shelf life by examining the interpretation and practical application of date labelling.

## **1.4 Research Questions**

The research questions are as follows:

1. Are durability dates safety indicators?
2. Should a food be deemed unsafe under Article 14 of Regulation (EC) No. 178/2002 after its ‘use by’ date?

## **1.5 Research Methods**

First, a literature study will be carried out. This will involve studying the background of date labelling from its introduction as a Directive at a European level in 1979 to the present day in the form of a Regulation. This will be followed by an examination of the legal texts, including Regulation (EU) No 1169/2011 and Regulation (EC) No 178/2002 and other relevant legislative texts to provide the legal context for date labelling. An overview of European, national and industry law and guidance on date labelling will then be conducted supported by semi-structured interviews with a national enforcement body and trade associations to provide an understanding into how meaning is given to the date labelling requirement. This will be followed by semi-structured interviews with the food industry to gain an insight into how date labelling is carried out in practice. Discussion will then follow as to whether the date labels act as food safety indicators and whether food should be deemed “unsafe” once the expiry date has passed. Conclusions and recommendations will then be made.

## Chapter 2: Principles of quality, safety and shelf life

### 2.1 Product shelf life

Food is different from many other goods on the market as it can be considered 'a complex system with a dynamic and variable behaviour' (Luning & Marcelis 2006, p.380). This can be ascribed to: heterogeneity of food products; large compositional variations due to cultivar/breeding differences, seasonal influences, weather and harvesting conditions; continuous decay of quality attributes due to a wide range food processes each has its own behaviour depending on applied processes; interactions between food compounds and with packaging and equipment materials. Food changes over time and these changes may differ for similar food products (Luning & Marcelis 2006). Shelf life can be limited by food processes which deteriorate food products such as microbiological, chemical, biochemical, physical or physiological changes (Luning & Marcelis 2009). These factors may cause a sensory change in the food or cause food to become unsafe (Walker 2000).

Shelf life can be defined as 'the time between the production and packaging of the product and the point at which it becomes unacceptable under defined environmental conditions' (Ellis & Man 2000, p.23). Shelf life can also be defined as the time, during which the product will remain safe and keep desired sensory, chemical, physiological and microbiological characteristics (Kilcast & Subramaniam 2000). It is therefore necessary to identify which deteriorative mechanisms restrict the shelf life of the product in order to control shelf life (Luning & Marcelis 2009).

There are a number of factors which can influence how food spoils and hence how long its shelf life will be. These factors can be divided into intrinsic and extrinsic factors. Intrinsic factors are: 'raw materials, product composition and formulation, product structure, product make-up, water activity value, pH and total acidity, and availability of oxygen and redox potential' (Man 2002, p.10). Extrinsic factors are: 'processing, hygiene, packaging materials and system, storage, distribution and retail' (Man 2002, p.11).

The shelf life of a food product can be dependent on many factors including 'the raw material quality, the formulation of that food, the processes applied, the hygiene of production and storage and the temperature of storage, distribution and sale' (Walker 2000, p.40). Most food deteriorates over time (Ellis & Man 2000); it is therefore necessary to be able to determine the shelf life of products to ensure the product is safe and has the desired quality when consumed. Hazard Analysis Critical Control Points (HACCP) is a risk analysis approach widely applied in the food industry to ensure food safety and quality. HACCP consists of carrying out a risk assessment to identify hazards and their associated risks and putting measures in place to eliminate/control the hazard. HACCP is 'the control of hazards throughout the entire food production process, up to and including consumption' (Smedley 2000, p.70). Although most safety factors at retail and consumption are outside the direct control of the manufacturer setting a safe shelf life and providing accurate information on the product label should also form part of the HACCP system. Therefore, it is important that manufacturers take HACCP principles into account during shelf life evaluation (Smedley 2000).

### 2.2 Quality

Quality is multidimensional, dynamic and user dependant, and as such there is no clear-cut definition or concept of quality (Luning & Marcelis 2009). A product can have different quality



attributes which can influence how food quality is perceived. These attributes can be sensory observable attributes for example taste and texture or non-observable attributes such as safety which need to be communicated. Date labels are one way to inform the consumer of the safety of the product.

Quality is user dependant as actors in the food chain 'may have different concepts of quality and different interpretations of quality attributes' (Luning & Marcelis 2009, p.43). Consumers judge product quality in terms of texture flavour etc. whereas the manufacturer looks at product properties and technological conditions to achieve the desired quality level. Therefore, a commonly accepted definition is that quality meets or exceeds customer and consumer expectations (Luning & Marcelis 2009).

### **2.2.1 Safety attribute**

As previously mentioned, quality and safety are not independent of each other as safety is a quality attribute. Food safety is 'the absence of hazards or the existence of hazard levels with an acceptable risk' (Luning & Marcelis 2009, p.44). The 'use by' date is for foodstuffs 'which from the microbiological point of view are highly perishable, and are therefore likely after a short period to constitute an immediate danger to human health' (Council Directive 89/395/EEC Article 1(19)). This date indicator is strongly linked to the safety attribute.

### **2.2.2 Sensory attribute**

The quality of a product can usually be expressed through its sensory attributes. Sensory attributes are intrinsic quality attributes and are very important to quality perception. Sensory attributes include texture and mouthfeel, taste, odour and appearance of the product. The date of minimum durability is 'the date until which the foodstuff retains its specific properties when properly stored' (Council Directive 79/112/EEC Article 9(1)). This date indicator is strongly linked to sensory attributes.

## **2.3 Influence of legislation on food quality**

The safety risks associated with food products fall into the categories of experience and credence attributes. Experience attributes are where 'information on the nature of the characteristics is available upon consumption' (Henson & Traill 1993, p.157) e.g. taste, acute food risk factors. A credence attribute is where 'information is only available some time after consumption' (Henson & Traill 1993, p.157) e.g. chronic food risk factors. Food safety is a credence good and as such it cannot be detected until after consumption.

By law, manufacturers must provide an indication of the shelf life of a product. European food legislation contains various requirements impacting the decision-making of food businesses with regard to shelf life. This is achieved by prescribing norms (e.g. no unsafe food may be placed on the market), setting safety standards for example requirements on the production, processing and distribution of food (e.g. HACCP), and by laying down requirements on communication (e.g. labelling) (Luning & Marcelis 2009). Date marking is legally required on most food products to inform the consumer of the shelf life of the product. This enables consumers to 'make safe and optimum use of food' (WRAP 2011, p.6).

## Chapter 3: Development of date labelling legislation

Date marking has evolved over the years from an optional internal stock control management system reflecting freshness of produce, to a consumer protection mechanism to a food safety device facilitated by a mandatory food labelling regime. By the late 1940s, 'coded date marking was widely used for stock management of tinned food' (Milne 2013, p.86). As more processed and packaged products were manufactured the use of date marking expanded. Retailers began to introduce coded systems to manage the freshness of their products. With the development of the consumer's 'right to know' pressure mounted for decoded 'open' date marking which retailers and manufacturers obliged to. At this time open date labelling regulations were being introduced across Europe. By the early 1970s, only three countries did not have some mandatory system for open date marking (Milne 2013).

### 3.1 Labelling Directive 79/112/EEC

In 1978 the then European Economic Community (EEC) passed Council Directive 79/112/EC on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs for sale to the ultimate consumer. The Directive was aimed at providing an approximation of the law, regulation and administrative provisions in Member States on the labelling of foodstuffs as differences existed in the Member States which could 'impede the free circulation of these products and can lead to unequal conditions of competition' (Council Directive 79/112/EEC Recital). The recital stated that 'the prime consideration for any rules on the labelling of foodstuffs should be the need to inform and protect the consumer' (Council Directive 79/112/EEC Recital). The Directive contained a list of mandatory particulars to be included on the labelling of all foodstuffs, one of which was the date of minimum durability (Council Directive 79/112/EEC Article 3(1)(4)). The date of minimum durability was defined as 'the date until which the foodstuff retains its specific properties when properly stored' (Council Directive 79/112/EEC Article 9(1)). This date was to be preceded by 'best before...' when an indication of the day is included in the date or as 'best before end...' in other cases (Council Directive 79/112/EEC Article 9(2)). The only reference to food safety i.e. a microbiological risk was that the Directive permitted Member States to use the term 'use before...' for foodstuffs, which from a microbiological point of view were highly perishable (Council Directive 79/112/EEC Article 9(2)). The legal reasoning during the legislative process for including a 'use before' can be found in Annex I. Members of the EU incorporated the objectives and rules given in the Directive in the way they deemed most suitable.

Food scares in the 1980's and 1990's highlighted the need to reform food safety regulation. The date labelling system shifted from focusing on food quality and representing consumers' interests to food safety and protecting consumers' health (Milne 2013.). In the UK, food scares were mainly associated with changes in food preparation and retail, in particular the expansion of cook/chill foods. These foods were seen as 'introducing new – and serious – microbiological risks to the food supply' (Milne 2013, p.92). In 1989, Directive 79/112/EEC was amended by Council Directive 89/395/EEC to include the 'use by' date for food. The date of minimum durability was required to be replaced by a 'use by' date 'in the case of foodstuffs which from the microbiological point of view are highly perishable, and are therefore likely after a short period to constitute an immediate danger to human health' (Article 9(a)). The legislator introduced a stricter system of dating for foodstuffs which are highly perishable from a microbiological point of view 'in the interests of a better

protection of public health' (Directive 89/395/EEC Recital). The new 'use by' labelling system led to shelf life being determined by microbiological load rather than consumer taste preferences (Milne 2013). The date labels therefore became more directly related to food safety as the 'use by' date explicitly indicated that the food was safe.

Overtime Directive 79/112/EEC was 'frequently and substantially amended' and subsequently 'for reasons of clarity and rationality' it was decided that the Directive be consolidated in a single text (Directive 2000/13/EC Recital 1). This was Directive 2000/13/EC on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs. The recital of this Directive stated that 'the need to inform and protect the consumer' should be 'the prime consideration for the rules on the labelling of foodstuffs' (Directive 2000/13 Recital 6).

### **3.2 Regulation (EC) 178/2002 General Food Law**

Since the start of the European Community the main focus was on creating an internal market. This was realised by harmonisation of the laws, regulations and administrative provisions of Member States through the use of vertical directives. European food law was principally focused towards creating an internal market for food products in the EU. However, after the BSE crisis and other food scares it became clear that the European legal framework needed to be reformed to improve food safety standards. The European Commission published a White Paper on Food Safety in 2000. This outlined the Commission's intentions to move the focus of food law from developing an internal market to assuring a high level of food safety. Emphasis shifted from vertical directives to horizontal regulations. In 2002, Regulation (EC) 178/2002, otherwise known as the General Food Law, was introduced laying down the general principles and requirements of food law. The emphasis was on 'providing the basis for the assurance of a high level of protection of human health and consumer's interest' (Regulation (EC) No 178/2002 Article 1(1)). The Regulation applies to the whole of the food chain, from 'farm to fork' considering all stages of the production, processing and distribution of food and feed (Regulation (EC) No 178/2002 Article 1(3)). The Regulation places the primary responsibility of food safety on the food business operator. The food business operator (FBO) must ensure that foods satisfy the requirements of food law and verify that these requirements have been met (Regulation (EC) No 178/2002 Article 17(1)). Article 14 of the General Food Law bans "unsafe" food being placed on the market. Article 19 of this Regulation places the responsibility on FBOs for withdrawal, notification or recall of products which do not comply with food safety requirements.

### **3.3 Regulation (EU) 1169/2011**

In 2011, Directive 2000/13/EC on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs was combined with the Council Directive 90/496/EEC on nutrition labelling for foodstuffs. These Directives were formed into Regulation (EU) 1169/2011 on the provision of food information to consumers which would apply from 13<sup>th</sup> December 2014.

The Food Information Regulation 'establishes the general principles, requirements and responsibilities governing food information, and in particular food labelling' (Article 1(2)). The basic requirement of this Regulation is that 'any food intended for supply to the final consumer or to mass caterers shall be accompanied by food information in accordance with the Regulation' (Article 6). The food business operator responsible for the food information is the FBO 'under whose name or business name the food is marketed or, if that operator is not established in the Union, the importer

into the Union market' (Article 8(1)). This FBO must ensure the presence and accuracy of the food information (Article 8(2)). An FBO is defined as 'the natural or legal persons responsible for ensuring that the requirements of food law are met within the food business under their control', in accordance with the General Food Law (Regulation (EC) No 178/2002 Article 3(3)). The reasoning as to why a food business operator is primarily responsible is that 'a food business operator is best placed to devise a safe system for supplying food and ensuring that the food it supplies is safe; thus, it should have primary legal responsibility for ensuring food safety (Regulation (EC) No 178/2002 Recital 30). The Regulation requires mandatory food information to be provided on 'all foods intended for the final consumer, including foods delivered by mass caterers, and foods intended for supply to mass caterers' (Regulation (EU) No 1169/2011 Article 1(3)). The date of minimum durability or 'use by' date is one of the mandatory particulars to be placed on a food item along with and any special storage conditions and/or conditions of use (Regulation (EU) No 1169/2011 Article 9(1)(f)(g)). These mandatory particulars on durability, storage and safe use are required to protect consumers' health and to ensure the safe use of food (Regulation (EU) No 1169/2011 Article 4(1)(b)).

All food products, other than those mentioned in Annex X(1)(d) of the Food Information Regulation, are required to have a date of minimum durability. The date of minimum durability is 'the date until which the food retains its specific properties when properly stored' (Article 2(1)(r)). According to the Regulation, this must be replaced by the 'use by' date for 'foods which, from a microbiological point of view, are highly perishable and are therefore likely after a short period to constitute an immediate danger to human health' (Article 24(1)). Annex X of this Regulation sets out how these dates should be expressed.

Non-prepackaged food is not required to be accompanied with a date label. Where foods are offered for sale to the final consumer or to mass caterers without prepackaging, or where foods are packed on the sales premises at the consumer's request or prepacked for direct sale the only mandatory particulars which need to be provided are substances or products causing allergies or intolerances listed in Annex II of the Regulation (Regulation (EU) No 1169/2011 Article 44). The European Regulation does not require a date of minimum or 'use by' date to be provided.

A new addition to the food labelling requirement is that a food is deemed to be "unsafe" once the 'use by' date has expired. This is specifically in regard to Article 14 of the General Food Law which forbids unsafe foods to be placed on the market. This was not in the original proposal from the European Commission. Annex II provides an overview of how this became included in Regulation 1169/2011. This addition 'creates that presumption that food past its 'use by' date is unsafe' (Gill 2013, p.1). The Food Information Regulation makes it explicit that products with an expired 'use by' date are regarded "unsafe" with regard to paragraphs 2-5 of Article 14. According to the General Food Law, food is deemed to be "unsafe" if it is considered to be unfit for human consumption or injurious to health. Interestingly the Food Information Regulation does not specify whether a product with an expired 'use by' date is deemed to be unsafe because it is considered to be unfit for human consumption or because it is injurious to health. 'Use by' dates are to be applied to products which are 'likely after a short period to constitute an immediate danger to human health' (Article 14(1)). This seems more in line with a product being injurious to health and therefore unsafe. However, it appears from this rule that as a 'use by' date is applied to highly perishable products, a product with an expired 'use by' date could be unfit for human consumption prior to it becoming injurious to health.

### 3.4 Codex General Standard for Labelling

Parallel to the developments in the European Union on food safety standards, Codex Alimentarius established by Food and Agricultural Organisation of the United Nations and the World Health Organisation, was also developing. One of the main roles of the Codex Alimentarius Committee is to prepare international food standards to be published in the Codex Alimentarius. In 1985 the 'General Standard for the Labelling of Prepackaged food' was adopted. This food labelling standard aims to achieve harmonisation on a global scale to facilitate global trade. This standard contains definitions for the date of minimum durability and the 'use by' date. The 'use-by' date, otherwise known as the 'last consumption date' or an 'expiration date' is defined as 'the date which signifies the end of the estimated period under any stated storage conditions, after which the product probably will not have the quality attributes normally expected by the consumers' (CODEX 1985, p.1). This definition does not make explicit reference to the safety of the product. However, the definition does include that 'after this date, the food should not be regarded as marketable' (CODEX 1985, p.1).

In 2013, the 41<sup>st</sup> session of the Codex Committee on Food Labelling took place which saw New Zealand put forward a proposal to support a review of the Labelling Standard. New Zealand put forward the argument that 'currently some countries use date marking for food safety reasons as well [as] quality reasons while others use date marks solely to indicate period of optimum quality. 'Where date marking is used for both quality and safety reasons within a country, different terms may be used for each purpose and these terms may be subject to differing requirements accordingly' (CODEX Alimentarius Commission 2013, p.3). A further argument to support the revision of the Standard is that 'there is no indication in the Standard of when (other than when determined in an individual Codex standard) the other date marks defined in the Standard (e.g. "Use-by Date" and "Sell-by-Date") should be used' (CODEX Alimentarius Commission 2013, p.3).

The EU welcomed the discussion paper agreeing that 'date marking is a key element of food labelling, which is linked to both the quality and the safety of the food consumed' (European Union, 2013, p.1). The concept of the 'use by' date was the EU's main concern supporting the revision of the Standard (European Union 2013, p.2). The EU commented that the definition for the date of minimum durability and the 'use by' date were too similar and pointed out that in EU legislation 'both notions exist but are clearly distinguished' (European Union 2013, p.2). The United States however were less in favour of the changes. Although the United States supported the proposal, they expressed concern that 'current date marking should not be construed as indicators of food safety since date marking best serves to indicate if a food is no longer marketable and cannot be used [as] a primary source of information on food safety' (USDA 2013). This goes against the EU system which does exactly that. Date marking is used in the EU as the primary source of information on the safety of food products. The United States appear in favour of 'sell by' dates which indicate to retailers that products should not be sold after this date. This strongly resembles the initial reason for introducing date marking which was as a stock control management system.

## Chapter 4: Date labelling interpretation

This chapter will focus on the European, national and industry provisions on date labelling with particular focus on the Dutch food industry.

### 4.1 European level

In order to comply with the date labelling requirement in the Food Information Regulation, the FBO must make two core decisions; the first is to decide which date indicator to use, the second is to determine what the exact date should be.

The date labelling requirement provides two date indicators; 'use by' and a date of minimum durability, indicated as a 'best before' date. The Regulation does not provide a list of foods or categories of foods which fall into the scope of a 'use by' date and a list of foods which should receive a date of minimum durability. The Regulation only provides a list of foods which are exempt from the date labelling requirement. How the two date indicators are defined in the Regulation provides some insight into which date indicator to use. The 'use by' date is to be applied to foods which, 'from a microbiological point of view, are highly perishable and are therefore likely after a short period to constitute an immediate danger to human health' (Article 24(1)). This indicates that the 'use by' date is linked to food safety i.e. a microbiological risk that can harm the consumer's health. This is reinforced by the fact that food is deemed "unsafe" if the 'use by' date has expired. However, the Regulation does not provide any further guidance as to what 'highly perishable' is, making it subjective and open for interpretation. Foods with a 'use by' date must be accompanied with storage instructions to be followed (Annex X 2(b)). Information on the durability and storage of food falls under the category of 'information on the protection of consumers' health and the safe use of a food' (Article 4(1)(b)). The requirement that 'use by' dates shall be accompanied with storage instructions reiterates that this is to protect the consumers' health and ensure the food is safe.

The Regulation defines the 'date of minimum durability' as 'the date until which the food retains its specific properties when properly stored' (Article 2(2)(r)). Further guidance as to what 'specific properties' are and what 'properly stored' means are not specifically defined in this Regulation. A commentary on the Food Information Regulation suggests that 'specific properties' of a food will depend on the product itself (Hagenmeyer 2012). It suggests that 'specific properties' are characterised by the nutritional and consumption value of the food where the nutritional value relates to 'the nutrients and other substances a food contains' and the consumption value is particularly related to the 'taste, scent, consistency, freshness, state of aggregation and the appearance of a food' (Hagenmeyer 2012, p.42). According to Mröhs, from the Bund für Lebensmittelrecht und Lebensmittelkunde e.V., specific properties of a product can also be defined by their usefulness. 'The usefulness of a product is reflected by its technological properties, mainly the fitness to use the product in further preparations such as baking, cooking and so on' (Mröhs 2000, p.103). The definition of the date of minimum durability 'allows the processor to set the quality standard of the food, as the product will still be acceptable to many consumers after the "best before" date has passed' (Robertson 2010, p.11).

#### 4.1.1 Parliamentary questions

Answers for questions posed to the European Parliament on expiry dates provide limited additional guidance. The 'best before' date 'indicates the date until which the food retains its expected qualities' (European Parliament, 2013a). The marketing of foods with an expired 'best before' date is not expressly prohibited in the Food Information Regulation. The European Parliament defends this position that this is 'provided that the foods concerned are still safe and their presentation is not misleading' (European Parliament, 2013a) or in other words 'if the food business operator can assure that the food still meets all food law requirements' (European Parliament, 2012).

These interpretations appear to suggest that the 'best before' date is a quality indicator.<sup>1</sup> The date of minimum durability of a food only needs to be achieved when the food is properly stored (Regulation (EU) No 1169/2011 Article 2(2)(r)). The Food Information Regulation requires that 'if need be' the date of minimum durability 'shall be followed by a description of the storage instructions which must be observed if the product is to keep for the specified period' (Annex X (1)(b)). This suggests that how the product is stored may not be integral to the safety of the product.

The Food Information Regulation does not directly indicate what an appropriate shelf life is (except in the case of eggs). This is left up to the food business as, according to parliamentary questions, 'food business operators are best placed to understand the properties of their products and to consider other factors such as food manufacturing practices, good hygiene practices and condition of storage' (European Parliament, 2013b). However, there are some additional provisions in legislation which can guide businesses in this. One of which is Regulation (EC) No 2073/2005 which provides the microbiological criteria that specific foodstuffs must meet throughout the shelf life of the product. When determining the shelf life of a product it is important to consider the microorganisms which may be present in the product as this could influence its shelf life. FBOs must ensure that the foodstuffs in the scope of this Regulation comply with the relevant microbiological criteria under reasonably foreseeable conditions of distribution, storage and use (Article 3(1)(b)).

Commission Regulation (EC) No 589/2008 lays down detailed rules for implementing Council Regulation (EC) No 1234/2007 as regards to marketing standards for eggs. Article 13 states that eggs should receive a date of minimum durability. The Regulation also states that the date of minimum durability should not be more than 28 days after the eggs have been laid. The Regulation also includes a third date indication, the 'sell by' date. This is defined as 'the maximum time limit for delivery of the egg to the final consumer' (Article 1(d)). The maximum time limit is stipulated in Regulation 853/2004 as 21 days (Annex III, Section X, Chapter I(3)). The 21 day time limit is an indication highlighting the particular freshness of the egg (Commission Regulation (EC) No 589/2008 Recital 20). Products must therefore be taken off the shelves 7 days before the date of minimum durability.

#### 4.1.2 European organisations representing the food and drink industry

An interview was carried out with an organisation which represents certain sectors of the food and drink industry on a European level to gain additional information on how the organisation distinguishes between both date indicators. According to the representative, date labelling was not an issue which had been raised by their members from the food industry. This may be because these

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<sup>1</sup> The term 'quality indicator' is used in this thesis to mean primarily the sensory attributes of quality as given in Chapter 2.



issues may be dealt with first by national or industry trade associations. When questioned about the definition of 'use by' and 'best before' dates, the interviewee responded that a 'use by' date is the date given to perishable food so it's linked to safety. Past this date it is harmful to health. That is the purpose of this date and so the legal requirement is there for safety. It provides a safety net. With regards to the 'best before' date the interviewee stated that this is to do with taste and flavour etc. and that it is primarily a quality indicator.

When questioned about the necessity of safety margins on expiry dates, the interviewee stated that a safety margin on 'use by' dates is necessary as there are lots of different situations whether things can go wrong. However, if the margin is too long then the 'use by' date is not achieving what the legislation is there for. The 'use by' date should be linked to safety otherwise there's no distinction between the two dates. The interviewee believed that it is essential to have a quality margin on 'best before' dates, not a safety margin, as 'best before' is related to quality. When eating something with a 'best before' date you expect a certain quality so therefore it is necessary to have a quality margin on the date.

The interviewee referred to a guidance document developed by FoodDrinkEurope (an organisation representing the food and drink industry at a European level) and EuroCommerce (an association for retail, wholesale and international trade interests) on the Provision of Food Information to Consumers (Eurocommerce and FoodDrinkEurope 2013a). This was 'to help facilitate a common understanding between European retailers and manufacturers on the requirements of EU labelling rules' (FoodDrinkEurope 2013).

#### **4.2 National level**

The Netherlands have two national regulations in relation to date labelling: the Warenwetbesluit Bereiding en behandeling van levensmiddelen (Food and Drugs Act Decision on Preparation and Handling of Food) and the Warenwetbesluit Etikettering van levensmiddelen (Food and Drugs Act Decision on the Labelling of Foodstuffs). This can provide the Dutch food industry with more clarity as to how to comply with the European date labelling requirements.

The Warenwetbesluit Bereiding en behandeling van levensmiddelen requires in Article 15 that when foodstuffs which need to be stored under chilled conditions to prevent microbiological spoilage or the growth of pathogenic bacteria must be stored between 0-6°C or have a shelf life of less than 5 days then Article 17 of the Warenwetbesluit Etikettering van levensmiddelen is applicable (Article 15(1) and 15(2)). Article 17 states that a 'use by' date should be used for food which from a microbiological point of view is highly perishable and therefore after a short period can constitute an immediate danger to public health. Therefore, in the Netherlands, a 'use-by' date indicator must be used when the storage conditions on food packaging state that the product must be kept between 0-6°C or when a food product, according to the producer, has a shelf life of less than 5 days.

Until recently, the Netherlands had an additional regulation known as the Zuivelverordening 2003, Melk en melk-en zuivelproducten (Dairy Regulation 2003, milk, milk- and dairy products) which provided additional labelling requirements for milk, dairy products and quark. This regulation required these products to have a date of minimum durability (Article 2(1)) and prescribed storage instructions to be indicated as "keep refrigerated (max 7°C)" (Article 2(2)). As the products could be stored above 6°C Article 15 of the Warenwetbesluit Bereiding en behandeling van levensmiddelen would not apply to these products, thereby falling outside the scope of receiving a 'use by' date.



However, the Zuivelverordening contained an additional provision which made it forbidden to sell or deliver these products once the date of minimum durability had been passed (Article 2(3)). This indicates that the date of minimum durability could therefore also be a safety indicator, at least for chilled products. This is contradictory with the European legislation, which does not explicitly forbid products with an expired 'best before' date to be on the market. The Regulation was repealed on 20/08/11, yet current guidance documents and hygiene codes are still based on this Regulation.

#### **4.2.1 National food enforcement body**

The Nederlandse Voedsel- en Warenautoriteit (NVWA) otherwise known as the Netherlands Food and Consumer Product Safety Authority ensures food businesses comply with European and national food safety legislation. The NVWA's role with regards to date labelling includes:

- Sampling and microbiological testing to see whether the products meet the microbiological criteria in Regulation (EC) No 2073/2005 within shelf life given on packaging
- Involvement in recalls if products do not meet microbiological criteria + RASFF (Rapid Alert System for Food and Feed) notifications
- Involvement in the interpretation of legislation with the Ministerie Volksgezondheid, Welzijn en Sport (Ministry of Health, Welfare and Sport)

The NVWA has produced an information document for businesses on shelf life and how to differentiate between 'use by' and 'best before' (Voedsel en waren autoriteit 2009). An interview was carried out with a representative from the NVWA who coincidentally drafted the information document to gain additional information on how the NVWA defines both date indicators.

The best before date is described as the date up until the producer or seller can guarantee the quality of the product and that it is fit for purpose. The information sheet states that the person who establishes this date is also responsible for the quality of the product, thereby indicating that the 'best before' date relates to quality. The document further outlines what the normal characteristics of a product could be e.g. normal colour, odour, consistency, taste, not decayed and no risk to human health). This could go some way to clarifying what is meant by 'specific characteristics' as given in the definition for the date of minimum durability. The guidance document goes further to state that it is not a breach of legislation if a product is sold past its 'best before' date so long as the product still meets the requirements of the law, suggesting that these products are linked more to quality characteristics than safety characteristics. The information sheet however contains an exception for pasteurised milk, dairy products and eggs, which is based on the Zuivelverordening 2003. Selling these products past their 'best before' date is forbidden.

In the Netherlands a 'best before' date can be given to both chilled products and ambient/shelf-stable products. However, a clear distinction is made between the two. According to the information document, for products which can be stored under ambient conditions the 'best before' date is mainly based on the quality characteristics of the product. These products may be sold once the 'best before' date has expired. However, it is then the responsibility of the retailer to determine after the 'best before' date and this decision must be based on a risk analysis. The representative for the NVWA stated that for ambient products an organoleptic assessment is sufficient (e.g. looking, smelling, tasting the product). For products which are required to be stored under chilled conditions the 'best before' date not only guarantees the quality requirements of the product but also the food

safety requirements. This is because products which need to be stored under chilled conditions are generally perishable products in which pathogenic bacteria can grow. Due to this reasoning the NVWA is of the opinion that for chilled products the 'best before' date should be seen as a 'sell by' date. In this case, the 'best before' date not only relates to quality characteristics but also safety characteristics. However, should a retailer wish to sell a chilled product past its 'best before' date then according to the NVWA representative this would need to be supported by a risk analysis in which the microbiological safety of the product is tested. Unfortunately, retailers are generally not able to carry out a thorough risk analysis and as the industry hygiene codes do not outline how to do this the NVWA conclude that the 'best before' date should therefore be seen as the 'sell by' date.

The guidance document provides some examples of products which are highly perishable such as fresh meat, fresh fish, fresh chicken and freshly cut vegetables.

During the interview the NVWA representative confirmed that a 'use by' date is primarily a safety indicator and that a 'best before' date is primarily a quality indicator but was reluctant to suggest that this was the case in every case as some businesses do not apply these dates in an upright manner. The example was provided of a manufacturer producing fresh soup with a two year shelf life who was asked by a retailer to have a two day shelf life on the product so that it could be sold in the chilled section and give the appearance of freshness. This practice is legal. The FBO has the obligation to provide a correct date indicator (use by/best before) and to indicate the shelf life of a product. However, the Food Information Regulation does not specify how a food business should determine the durability of a product. This is left up to the FBO. The FBO does have to ensure that the product meets food safety norms such as not placing unsafe food on the market. However, besides complying with relevant food safety legislation there is no further legal requirement on providing a product expiry date which is before its actual shelf life. Providing an expiry date after the actual shelf life of the product is illegal as the product would then fall under Article 14 of the General Food Law which forbids unsafe products being placed on the market.

The NVWA representative believes that a 'use by' date is a mix of both safety and quality. A product will deteriorate in quality faster than the product will become unsafe. Growth of bacteria can be favourable also for pathogenic bacteria as the product can become so sour for example in milk before the product becomes unsafe as pathogenic bacteria cannot grow in those conditions.

The Warenwetbesluit Bereiding en Behandeling van levensmiddelen gives meaning to what is 'highly perishable' and should therefore receive a 'use by' date. When questioned as to why the Netherlands deem it necessary to add an additional requirement to the European date labelling requirements the interviewee responded that this was strongly recommended by the Advice Commission Warenwet. In addition, the Article will ensure maximum certainty that products which from a microbiological point of view are highly perishable provided by a lower storage temperature or limiting the shelf life and therefore has a short shelf life will not pose a risk to consumers.

With regard to 'best before' dates, according to the interviewee, a 'best before' date has practically no safety characteristics and it is not illegal to sell a product past the 'best before' date. However, up to this date the retailer has a guarantee on the shelf life of the product from the manufacturer. After this date the retailer becomes responsible for the product if it remains on sale. If the retailer wants to sell the product after this date they will need to do a technical analysis and consider their HACCP.

Selling products past the 'best before' could therefore be a non-compliance but this would be under the legal requirement of HACCP.

The interviewee suggested that safety margins are used for both date indicators as products can generally be eaten after the expiry date has passed. However, a product with an expired 'best before' date will be able to be kept for longer and will be better to eat. When questioned whether a shorter or a longer date would be more advantageous from a marketing point of view the respondent replied that either can be advantageous. For example if it is for commercial reasons then you can have a very long margin (e.g. with the soup example). However, at times like Christmas you want to make sure that Christmas products can have a longer date so that the products can be consumed at Christmas and don't expire before. In addition, the interviewee indicated that if the product's shelf life is given in days then the safety margin will be given in X amount of days. If the expiry date is given in month then it is likely the safety margin will be given in X amount of months. Therefore, it can be assumed that products with a longer shelf life will have a larger safety margin.

When questioned about how optimal date labelling was currently functioning the respondent replied very optimal as where date labels are required they are present. However, date labelling could still be improved as dates should be as authentic as possible and not for commercial gain. Some businesses misuse the system so that products receive a longer date than they should have so that the product can be sold for longer or a shorter date to give a product the appearance of freshness.

Main findings:

- Quality deteriorates before safety
- Distinction is made between chilled and ambient products with 'best before' dates and selling these products with an expired date have different requirements for proving the product may continue to be on the market.
- Can be a non-compliance to sell a product with an expired 'best before' date but under HACCP and not the date labelling requirements
- 'Best before' and 'use by' dates have a safety margin

### 4.3 Industry level

Regulation 852/2004 concerns the hygiene of foodstuffs. Article 5 of this Regulation requires FBOs to put in place, implement and maintain a permanent procedure or procedures based on the HACCP (Hazard Analysis and Critical Control Points) principles. This involves the FBO analysing food processes to identify any potential hazards and to put in place controls and corrective actions. Article 7 of this Regulation requires Member States to 'encourage the development of national guides to good practice for hygiene and for the application of HACCP principles'. These guides must be developed and disseminated by food business sectors (Article 8(1)) In the Netherlands these are known as hygiëncodes. The requirements for establishing hygiene codes in the Netherlands are found in the Warenwetbesluit hygiëne van levensmiddelen. Hygiene codes are drafted by a branch organisation and according to the Warenwetbesluit is discussed at the Regulier Overleg Warenwet and requires approval by the Minister (Article 4(1)). According to the NVWA, the hygiene codes contain an inventory of the risks within a particular food sector and how businesses can operate to

control these risks (NVWA, n.d.). A business which follows the hygiene code complies with the legal requirements on food safety, both for the basic requirements of hygiene, structure, training etc. but also with HACCP. Various food business sectors have produced a hygiene code for their specific product sector. Some of these hygiene guides prescribe the shelf life for certain products.

#### **4.3.1 Interview: national organisation representing the food industry**

An interview was carried out with the Regulatory Affairs Manager of a national organisation representing the food industry to find out what the organisation's view is on date labelling in specific 'use by' and 'best before' dates. The representative completely agreed that 'a 'use by' date is primarily a safety indicator' and that 'a 'best before' date is primarily a quality indicator.

When questioned on the topic of safety margins the interviewee did not believe that it was essential to have a safety margin on 'use by' dates as if you look at consumer behaviour with regard to the 'use by' date e.g. the consumer throws food away once the date has passed then it is not essential to have a safety margin on the date itself as that is adding safety on safety. Instead, the interviewee was of the opinion that the factors used to determine shelf life should incorporate safety margins e.g. is the product properly processed? Is the product properly chilled during storage and transport? With regard to whether it is necessary to have a safety margin on 'best before' dates the interviewee stated that if you require a safety margin on your 'best before' date then you should give the product a 'use by' date. The interviewee stated that a manufacturer may incorporate a safety margin because of how the product is used or treated by the consumer or because refrigerators at retail are not a constant temperature due to the refrigeration units being opened all the time.

Main findings:

- Safety margin should be on factors determining shelf life and not in the date itself
- It is not essential to have a safety margin on 'best before' dates

#### **4.3.2 Interview: National Supermarket Branch Organisation**

An interview was carried out with a supermarket branch organisation to gain an insight into the challenges faced by the retail sector. The role of the organisation with regard to date labelling is twofold: (1) ensure members have the correct information with regard to those members of the organisation which make private label products (2) ensure all the information on product labels is clear and correct to facilitate consumers' choice.

The interviewee fully agreed that a 'use by' date is primarily a safety indicator but that quality also plays a role in products with 'use by' dates as one does not want products which are safe but inedible. The 'use by' date is based on safety, on the risks that there are, but it will still have some quality so you cannot see safety and quality separately. The interviewee completely agreed that a 'best before' date is primarily a quality indicator and that products with a 'best before' date will always be safe as the date is only related to quality. However, the respondent then went on to comment that in the hygiene codes a difference is made between chilled and ambient products with a 'best before' date and that it is not always just about quality for chilled products. The 'best before' date on chilled products is based more on safety, than quality so a risk analysis is required if you want to sell the product past the 'best before' date. This is in line with the NVWA guidance. However, milk and dairy products may never be sold after 'best before' date. This appears to be

based on the Zuivelverordening which no longer exists as the NVWA representative confirmed that there is no new regulation for milk and dairy products.

The interviewee fully agreed with the statement that 'it is essential to have a safety margin' as you don't want people to get sick. A safety margin allows you to still be able to guarantee that the product is OK when it's on the shelves because you can't know the characteristics/properties of the product for every product. The interviewee stated that manufacturers have a safety margin on expiration dates and that this is not wrong as they are protecting themselves. It is not good for consumers or businesses and the retail industry want to meet consumers' expectations.

With regards to how optimally date labelling is currently functioning the interviewee did not find that it was very optimal due to there being a lot of waste as consumers throw products away once the date has passed without even trying the product. However, the interviewee believed that the date labelling requirements are pretty clear in what is allowed and what not and that manufacturers know what they can and can't do. The interviewee held the belief that it is the consumers which don't understand. When questioned as to what could be done to improve date labelling the interviewee believed it necessary that knowledge about date labels is improved and that everyone needs to do this in their own way; the retailer, manufacturer, government, schools (lessons) with the belief that behaviour will change with knowledge.

Main findings:

- 'Use by' dates include both safety and quality
- Essential to have a safety margin

## Chapter 5: Date labelling implementation

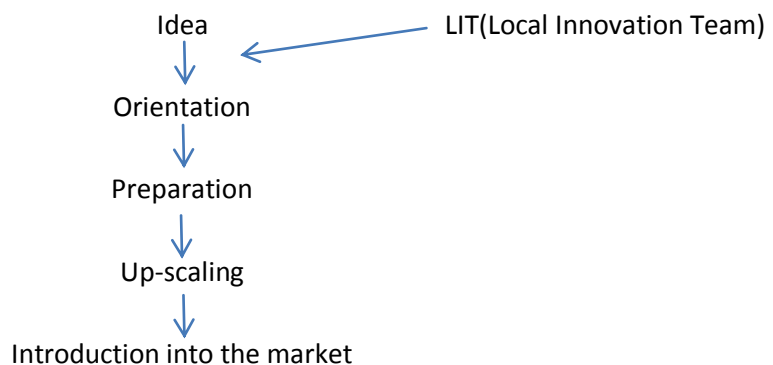
Interviews were carried out with representatives from the food industry to gain an insight into how date labelling is implemented in practice. An exploratory interview was initially carried out to form a basis for the interview questions for subsequent interviews. The interviews were semi-structured to allow interviewees to substantiate their answers and to provide an opportunity to see and understand the topic at hand from various perspectives. The main areas explored during the interviews were how date marking is determined, in how far 'best before' and 'use by' dates are quality and/or safety indicators.

### 5.1 Interview: Dairy Company

The initial interview was conducted with a Food Safety Manager of an international dairy company. The interview explored how the company determines the shelf life of foods in particular the factors which affect where the shelf life is set and how the company understands and differentiates 'use by' and 'best before' dates. This provided valuable insight into the complexity and multi-faceted side of date labelling.

#### Determining shelf life

The shelf life of a product is determined during the innovation process of a product. The interviewee made a flow chart to illustrate the innovation process of a new product. This is shown below:



The whole process is guided by the Local Innovation Team (LIT). This is made up of different experts from finance, marketing, logistics, supply chain, quality assurance (QA) and regulatory affairs (RA). The marketing department initially define what products they want to sell and what the shelf life of these products should be. The LIT will advise at the idea stage whether the durability date proposed is feasible for the product. If it is not feasible then the idea is scrapped. For example if marketing want a highly perishable product to have a long shelf life the Quality Assurance representative would inform other members of the LIT that this would result in an unsafe product and the idea would not progress to the next stage.

If the proposed shelf life is feasible the Research & Development (R&D) department will incorporate this into the innovation process of the product. The actual shelf life of the product is determined when the product reaches the factory floor. The R&D department will then carry out organoleptic tests to test the product characteristics and stability. The QA department will look at the food safety of the product and carry out microbiological tests. The results of these tests will determine whether

the initial requirements given by marketing have been fulfilled or not. If the shelf life of the product is found to be shorter than that required by marketing then the company must consider whether it is possible to redesign the product to attain a longer shelf life or whether marketing and sales can sell the product with a shorter shelf life.

The company carries out two types of shelf life tests. The first test is carried out under the conditions defined on the packaging e.g. the storage instructions and the second test (sensitivity analysis) reflect the uncontrolled conditions in the market. The uncontrolled conditions in the market are based on European Commission studies which show the actual temperatures in the cold chain. There may also be contamination after processing e.g. from the filling containers, so bacteria may survive processes such as pasteurisation. Here a microbiological/statistical approach is taken by modelling.

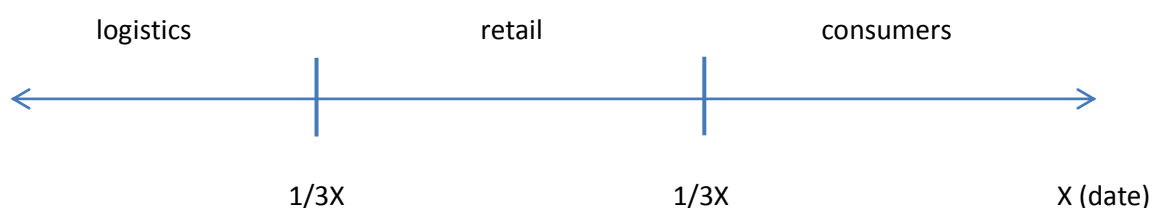
The expiry dates of product ingredients are incorporated into the product expiry date. The company generally extends the date of the product ingredients. The company can justify this practice by applying processing techniques to the product and also by testing the final product.

#### Choosing the date indicator

The decision on whether a product should receive a 'use by' or a 'best before' date is based on whichever date indicator is safest to use. The company decides whether a product is 'highly perishable' from a microbiological point of view based on analysis of consumer complaints and microbiological testing. A 'best before' date is also a safety indicator from a microbiological point of view but it has more to do with quality as the quality of the product will deteriorate before the product becomes unsafe. The interviewee stated that it was illegal to sell a product past its 'best before' date but admitted that he was not a legal expert. Products receive a 'best before' date when they fall out of the scope of the Warenwetbesluit bereiding en behandelings which states that products which are stored between 0-6°C or are perishable within 5 days must have a 'use by' date. According to the interviewee the term 'specific properties' as given in the definition for the date of minimum durability<sup>2</sup> is something which is defined by marketing. For example, if the product is marketed as an orange drink then it must still taste of orange; if the product is supposed to be a yellow product then it must still be yellow.

#### Choosing where to set the shelf life

The interviewee explained that after production the shelf life of a product is divided up into three categories: logistics, retail and consumer illustrated below:



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<sup>2</sup> The date of minimum durability is the date until which a product retains its specific properties.

The company needs part of the shelf life of the product to transport the product to distribution centres and subsequently to retail outlets. The retail outlet must have enough time to have the product on the shelves in order for consumers to purchase the products. The consumer must be given enough time to use the product before the date expires.

When determining how to divide the durability of the product across these three categories the views of each stakeholder needs to be taken into consideration. The logistics department have to organise the delivery of a large variety of products; this means there are smaller batches. This department therefore requests to have a longer date on the product, or a more of product's shelf life. The company then needs to look at whether shelf life can be extended or whether some of the time given to retail can be shifted to logistics. Production, marketing, sales or logistics may request for the shelf life to extended, however, the company is not prepared to compromise on safety and image. The shelf life contains a margin of safety of 10-20% on products. Food safety and image are the two most important factors which influence where the date is set. Retailers may also influence where the food business limits the shelf life of a product as retailers want to reduce the risk of food spoilage. Therefore, retailers tend to ask manufacturers to deliver the products earlier so that the products can be on the shop shelves for longer.

The interviewee commented that it was illegal to sell products once the 'best before' date had passed. European and national law do not forbid products with an expired 'best before' date to be on the market. However, under the Dairy Regulation (Zuivelverordening) it was illegal to sell milk, dairy products and quark past their 'best before' date which explains the representative's views. The fact that the company sells dairy products may also explain why the interviewee considers the 'best before' date to be a safety indicator as chilled dairy products can potentially become unsafe after the expiry date of the product.

Main findings:

- Quality deteriorates before safety
- 'Best before' date is also a safety indicator
- Various factors influence where the shelf life is set
- Dates have a safety margin

## **5.2 Interview: Fresh meat Company**

### **Determining product shelf life**

An interview was carried out with the Head of Quality Assurance at an international meat company. When determining the product shelf life the company stated that they first needed to be aware of the characteristics of the meat as a carcass for example will be handled differently than offal. It is then necessary to determine what the spoilage organism is and how sensitive it is to different conditions. Subsequently one asks what shelf life is possible. The quality department looks at physical changes, bacterial load and organoleptic characteristics of the meat. There are pre-agreed conditions in relation to lighting,  $a_w$  (water activity) and temperature for the meat. Validation testing is carried out on these conditions. The different characteristics are communicated to marketing + sales.



### Determining expiry dates

When determining expiry dates for products the company has data sheets for every product category with the shelf life on it. Consumer products receive a 'use by' date. Larger pieces e.g. a carcass or half a carcass receive a 'best before' date.

When asked how the company can ensure that the sampling results which determine the expiration dates for the product category are valid for each similar cut of meat in that category the response was that there is standardisation in relation to feed, animal welfare etc. so variation in the product is limited because everything is controlled.

Customer requirements can also determine expiration dates. Customer or national requirements are just as important in determining expiration dates. Retailer requirements are very important. Either you give the retailer the shelf life they want or do not supply. Retailers want shorter dates so that the product comes across as fresh. Ultimately the producer/manufacturer must be able to guarantee the date which is placed on the products.

When asked which aspects influenced where the date was set quality, consumer protection, product quality and retailer requirements were very important. The interviewee was not of the opinion that legislative requirements influenced where the date was set as you operate from them. They are essential; legislative requirements facilitate safety. In terms of prioritising the aspects which influence where the expiration date is set the interviewee stated that safety is the number 1 priority, quality is priority number 2, liability is priority number 3 and business to business liability is priority number 4.

The interviewee disagreed that a 'use by' date is primarily a safety indicator as organoleptic indicators are more important when determining the expiry date. The interviewee strongly agreed that a 'best before' date is primarily a quality indicator but that a 'best before' date also includes safety. The interviewee agreed that it is essential for a 'use by' date to have a safety margin but that product specifications already have a safety range built-in.

Main findings:

- Product specifications have a safety range built-in
- 'Best before' date also includes safety

### **5.3 Interview: Stable/ambient goods Company**

An interview was carried out with a Regulatory Affairs Officer of a multi-national company specialising in condiments and meals. The standard interview questions were used to determine how the company determines the shelf life of foods.

### Determining shelf life

Shelf life is not determined by one sole person in the company, it involves a whole chain of people. The shelf life of a product is considered during product development. During the conceptual stage of a product the marketing department indicates the desirable shelf life for the product. R&D develops a product with a de facto standard of look, taste, mouth feel which defines the shelf life. A business

model is made of the product to determine whether it is profitable or not. Shelf life is one of the factors taken into consideration in this decision. Logistics is the biggest cost.

At the production stage, QA look at the stability of the product. When a new product is developed it has new variables. QA assess whether these variables have a negative influence on the stability of the product. QA also look at the start load of contaminants for finished products with regards to microbiological risks as this can influence the shelf life of a product.

Processing can also elongate shelf life. Most products at the company receive some form of processing such as pasteurisation, sterilisation or flash freezing. However, this can influence the chemical balance of products changing the taste, odour or mouth feel. Organoleptic testing is therefore very important for the company. Product shelf life tends to be determined by organoleptic testing. A lot of products at the company already have a model. Once the product has been placed on the market R&D monitors the product and carries out further sampling.

#### Choosing the date indicator

The interviewee strongly agreed that a 'use by' date is primarily a safety indicator and that a 'best before' date is primarily a quality indicator but that some safety is still involved. The interviewee stated that expiration dates are all about quality aspects. The interviewee also stated that protecting the consumer's health is very important and therefore their company takes the position to protect rather than to be held liable.

#### Choosing where to set the shelf life

The interviewee stated that expiration dates are determined by various factors. Raw materials from suppliers will have an expiry date. This can influence the expiration date of the product. However, the durability of the ingredients used in a product will anyway be influenced by the production methods they undergo. The interviewee stated that the expiry date is on the product, not on the ingredients. Therefore, if the product ingredients can limit the expiry date in any way it is deemed a limiting ingredient. Flavourings are very important in products. Therefore, the expiry dates of flavourings for example are likely to be incorporated into the expiry date of the product and limit its durability.

Logistics are also an important determinant when determining expiry dates as there needs to be a margin of time available to get the product from the factory to the distribution centre and subsequently to consumers. The consumer should also be given enough time to consume the product. This company has a minimum time that the consumer should be able to have the product for. This is closely watched by the company's QA department as they are close to production and the QA team at the production site.

The consumer's health is very important to company 3. Therefore, the company takes the position to protect rather than to be held liable. Consumer protection therefore has a great influence as to where the expiry date is set. Product quality was deemed to have a strong influence in where the expiry date is set at the company. The interviewee stated that expiration dates are all about quality aspects. Brand image is a topic of interest at the company and is an important topic when establishing expiration dates. Legislative requirements are the most important factor to the company when establishing dates. Non-compliance is not an issue. However, the interviewee

believed there to be lenience in the legal text. For example phrases such as 'may use' and there not be a very strict rule as to how companies should communicate the date.

When asked whether retailer requirements influence the expiry date, the response was that retailers are part of the chain and have a reasonable demand. Retailers demand a certain date to distribute the product and to have the product on their shelves with a certain expiry date left. The company tries to meet these requirements by trying to deliver the product quicker or produce the product earlier for example. However, the company has a certain amount of time they want the consumer to have the product for. Therefore, they try to divide the remainder of the shelf life of the product taking into account retailer requirements, distribution and storage.

Cost was not deemed to be very important in determining the expiry date of a product as it is an aspect which is more important for the marketing department. Marketing want to generate as much revenue as possible. When asked which is more favourable from a marketing/revenue point of view to have a shorter shelf life (quicker product turnover) or a longer shelf life (product longer on the shelves) the response was that both situations can favour revenue but that there needs to be a balance between commercial values and sustainability.

Interviewee 3 found that there is lenience in the legal text such as 'may use' and that there is not a very strict rule as to how you communicate the date for example.

Main findings:

- 'Best before' date also includes safety
- Various factors influence where the shelf life is set
- Safety margin

#### **5.4 Interview: Retailer**

An interview was carried out with the Quality Manager Food Company of a national retailer which also has its own brands. The company has 4 priorities: food safety, quality, health (nutrition) and sustainability. They are viewed as equal, but food safety is the no.1 priority.

##### Determining product shelf life

The producer decides what the durability of the product is. QA at the manufacturer is responsible for this; however, the production manager is also involved in date determination. Tests are carried out at manufacturers and the retailer is informed about this date. The QA at the retail company decide if the proposed date is logical. This decision is generally based on experience, for example of similar products. The retailer must approve the expiry date.

According to the company representative, the product shelf life is based on three aspects: storage conditions, durability of the product and the packaging. Two types of tests are carried out to determine the product shelf life. These are microbiological testing, testing for pathogens and organoleptic testing e.g. taste, texture, odour, consistency. Organoleptic aspects tend to determine the product shelf life more.

In terms of logistics, the company looks at the life cycle of the product and its temperature regime. Tests are carried out to simulate the product at the factory, during distribution and at storage. There

are different temperatures at each stage in chain which needs to be taken into account when determining product shelf life.

#### Determining expiry dates

When determining expiration dates the company decides which organoleptic properties are the most important for a particular product. Subsequently, each property is given a weighting as to how important that particular property is to the product. These properties are then tested individually. Tests are carried out a few days before the proposed shelf life of the product and a few days after. The potential date is then given. The company has a quality level which all the products need to meet.

Consumer protection was not a strong determinant in influencing where the expiry date is set as 90% of the time the expiry date is determined by quality and organoleptic testing. Product quality and brand image were very important in influencing where the expiry date was set. Legislative requirements was not found to be a strong determinant of where the expiry date was set as legislative requirements is not relevant for every category which have more to do with quality. Marketing was unimportant in setting the expiry date as products with a short shelf life do not dictate marketing. If a product cannot have a certain date then the retailer will simply not sell the product.

Interviewee 4 completely disagreed that a 'use by' date is primarily a safety indicator. The interviewee claimed that organoleptic aspects of a product determine its shelf life. The interviewee went further to say that food spoilage is more likely than food poisoning. Interviewee 4 strongly agreed that a 'best before' date is primarily a quality indicator and that best before dates were generally given to shelf life stable products. Interviewee 4 stated that expiry dates are defensively set and that their products have safety margins. When asked what reasons would influence a company having a safety margin on products the interviewee responded that this was cost driven, to stay on the safe side to avoid a product recall. The retailer wants as long an expiration date as possible as they lose money on products which they have to write-off or price down. However, giving a product with a short shelf life one extra day could potentially cost millions as you run the risk that products are spoilt before the expiry date and that the retailer has to recall these products. This can also lead to consumer complaints. The interviewee suggested that the amount of margin should be about 10% but that the amount of reserve (margin) would be dependent on various factors such as the weather.

#### **5.5 Interview: Microbiologist**

An interview was carried out with a reputable microbiological expert from Wageningen University to balance and support the findings from the food industry. Interviews with industry representatives revealed that the quality of the product deteriorates before the product becomes unsafe. The microbiologist stated that in most cases this will be the case, as deterioration deals also with flavour, colour and many other aspects which are not safety related at all. However, a product can also become unsafe before one can see an effect on the quality. Products can become unsafe from a microbiological point of view without showing signs of deterioration. For example if a product contains a bacterium like EHEC it can still look in perfect condition. However, you only need around 110 cells to become sick, whereas spoilage is identified at around 1 million cells per gram.

According to the legal provision on use by dates, this date indicator should be allocated to products which are highly perishable and are therefore likely after a short period to constitute an immediate danger to human health (Regulation (EU) No 1169/2011 Article 24(1)). According to the microbiologist the relation between a product being highly perishable and constituting an immediate danger to human health after a short period of time is plausible. However, most spoilage organisms are not dangerous and as such are not very likely to make one sick.

According to the microbiologist, not all products which are chilled fall into the highly perishable category. Yoghurt for example will hardly spoil and is very unlikely to ever become unsafe. In the Netherlands, chilled products stored at 0-6°C or which have a shelf life of less than 5 days receive a 'use by' date. It is therefore possible that chilled products falling outside this requirement receive a 'best before' date. According to the microbiologist chilled dairy products with a 'best before' date can become unsafe from a microbiological point of view after the 'best before' date. Some organisms can grow very slowly, for example spore forming bacteria and therefore a product could become unsafe after this date. Spoiled milk for example can still be safe, although the quality has deteriorated considerably but it can also be unsafe. As one cannot see if pathogenic bacteria are growing these products should be discarded after the 'best before' date.

As previously mentioned, food safety is a credence good and as such it cannot be detected by the consumer until after consumption. The microbiologist agreed with this statement as microbiologists cannot whether spoilage is caused by pathogenic bacteria or other organisms. In addition, a pathogenic organism cannot be seen when there are no signs of spoilage.

The stable/ambient goods company take the start load of contaminants in products in account when determining shelf life. When asked whether HACCP procedures influence the microbial load of a product, the microbiologist responded that HACCP is a control system of procedures and as such does not influence anything directly. However, a HACCP system identifies potential hazards and problems and where to control them. Therefore, it can indirectly influence the microbial load.

Main findings:

- Safety is not visible
- Chilled foods can become unsafe after 'best before' date
- Food can become unsafe before quality decreases

## Chapter 6: Discussion

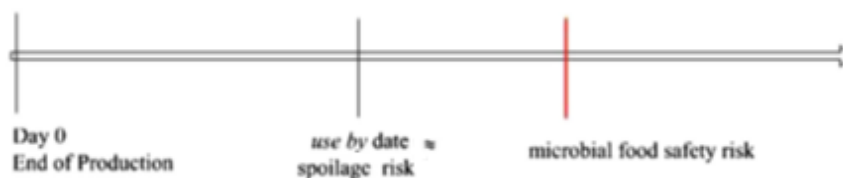
The main findings from the food industry are:

- Quality deteriorates before safety
- 'Use by' dates are based more on quality than safety thereby not informing the consumer of when the product becomes unsafe.
- 'Best before' dates are mainly based on quality and do not inform the consumer of when the product may become unsafe.
- Date markings are defensively set and these margins tend to be quality related rather than safety related.

Products can be divided up into three categories based on whether food safety parameters and/or quality parameters were limiting factors (Van Boxtael et al., 2014). These categories are: limiting shelf life of product with 'use by' date due to safety reasons, limiting shelf life of product with 'use by' date due to quality reasons, and limiting shelf life of a product with a 'best before' date due to quality reasons. The results from interviews with the food industry support these categories. Diagrams used in Van Boxtael et al., (2014) to illustrate these categories have been adapted to reflect the findings of this study. The shelf life of a product can be limited by food safety parameters (food safety risk) and/or quality parameters (microbial, chemical and physical spoilage/potential). The food safety risk can come from pathogenic bacteria whereas the microbial spoilage potential is from spoilage bacteria. From a legal point of view 'use by' dates are linked to highly perishable from a microbiological point of view and thus food safety risks. 'Best before' dates are linked more to the 'specific properties' of a product and thus can be linked to microbial, chemical or physical spoilage.

### 6.1 Use by dates

Interviews with representatives from the food industry revealed that 'use by' dates tend to be based foremost on quality parameters as the quality of a product tends to deteriorate before the safety of the product. The 'use by' date is assigned to a product when the quality starts to deteriorate e.g. where there is a microbial, chemical or physical spoilage risk. The microbial food safety risk comes later. This is illustrated in the diagram below:



By legal definition, the 'use by' date is based foremost on food safety parameters. A 'use by' date should be allocated to foods which from a microbiological view are highly perishable and which are therefore likely to constitute an immediate danger to human health. Therefore, the 'use by' date is to be assigned based on the microbial food safety risk.

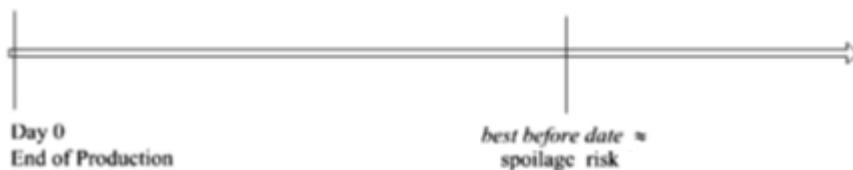
This is illustrated in the diagram below:



In addition, once the 'use by' date has expired the product is deemed "unsafe" under Article 14 of Regulation (EC) No 178/2002. A product which passes its 'use by' date could be unsafe if the date is based on the microbial food safety risks. However, as the interviews with the food industry reveal, quality deteriorates before safety and thus a 'use by' date is placed where quality starts to deteriorate. This finding suggests that there is a deficit between the legislator's classification of a 'use by' date and the application of 'use by' dates in practice.

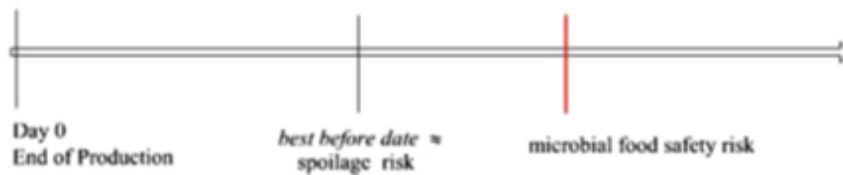
## 6.2 Best before dates

For 'best before' dates the findings are similar. 'Best before' dates are being applied in practice based on quality parameters i.e. where there is a microbial, chemical or physical spoilage risk. This is illustrated in the diagram below:



The legal definition of the date of minimum durability alludes to quality parameters; 'the date until which the food retains its specific properties' (Regulation (EU) No 1169/2011 Article 2(2)(r)). This date indicates until when food is fit for human consumption. However, it appears that the legislator also includes safety parameters in the 'best before' date. All foods should receive a 'best before' date unless from a microbiological point of view foods are highly perishable and are therefore likely after a short period to constitute an immediate danger to human health, in which case the 'best before' date should be replaced by the 'use by' date. In the Netherlands, a 'use by' date is to be applied to products which are stored between 0-6°C or have a shelf life of less than 5 days as thus classifies these products as highly perishable. However, chilled products may still be perishable yet fall out of the scope of having a 'use by' date applied as they are not *highly* perishable. Therefore, it is still possible for chilled products with a 'best before' date to become unsafe some time after the date has expired. This was supported by the microbiologist who stated that chilled products can become unsafe from a microbiological point of view after the 'best before' date as some organisms can grow very slowly. In the Netherlands, the former Dairy Regulation 2003 forbade milk, quark and dairy products to be sold or delivered once the date of minimum durability had passed (Article 2(3)). This indicated that the date of minimum durability could therefore also be a safety indicator, at least for chilled products.

This is illustrated in the diagram below:



Both 'use by' dates and 'best before' dates are being applied in practice based on quality parameters although safety aspects are related to both dates. From a legislative point of view, the 'use by' date is there to inform the consumer up till when the product is safe to consume. However, in practice the date is fixed where quality starts to deteriorate and not when the product is a safety risk. This creates a communication discrepancy between the manufacturer and the consumer. Consumers are advised not to consume products with an expired 'use by' date as they could become ill whereas in reality the date relates to when the quality of the product starts to deteriorate. That 'use by' dates are allocated in practice based on quality parameters is not communicated to the consumer.

A 'best before' date on the other hand, is communicated to consumers as the date until which the food retains its specific properties i.e. until when the product can be enjoyed at its best. Consumers are not informed that products with a 'best before' date can become unsafe after this date has expired and when this could be.<sup>3</sup> Therefore, neither 'use by' dates nor 'best before' dates are communicating the safety risks of the food.

### 6.3 Safety margins

The interviews also revealed that expiry dates are being cautiously set. This overcautious approach can lead to safety margins being incorporated in expiry dates. One of the main reasons for this is that the manufacturer is unable to control all the conditions in the market such as transportation and storage at retail or in the consumer's home. The manufacturer is primarily responsible for the safety of the product up till the expiry date so it is logical that these uncontrollable factors are taken into account when setting dates to protect the consumer from adverse health effects. Safety margins are also applied to avoid liability, to protect brand image and to ensure good quality products. The expiry date placed on food has this margin between production and the quality and/or safety risk. The 'use by' or 'best before' dates are therefore placed in advance of the risk. This is illustrated in the following diagrams:

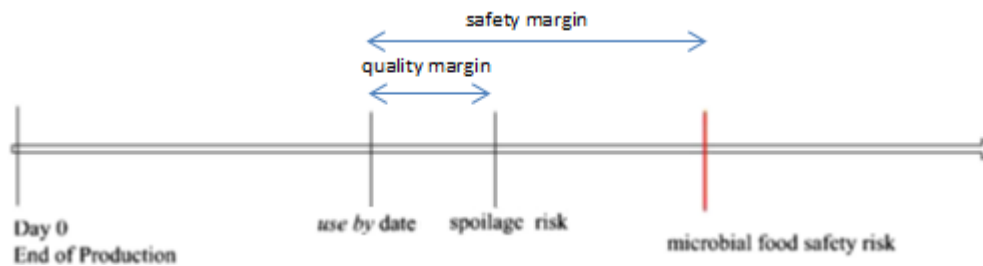


<sup>3</sup> In many cases spoilage is the main problem and this comes before the product becomes unsafe.





When taken into account that quality deteriorates before safety, products with a ‘use by’ date have in effect two margins; a quality margin and a safety margin. The quality margin is between the ‘use by’ date set and the spoilage risk. The safety margin is between the ‘use by’ date set and when there is a food safety risk. This is illustrated in the diagram below:



This in effect means that it is possible for food product with an expired ‘use by’ date to still be consumed safely after this date. On the other hand, the consumer is not informed that there is a margin and how large it is.

Shelf stable products with a ‘best before’ date will only have the quality margin, as the expiry date is solely based on quality parameters. Perishable products with a ‘best before’ date could have two margins; a quality margin and a safety margin. This is illustrated in the diagram below:



#### 6.4 ‘Use by’ linked to “unsafe”

The Food Information Regulation specifically linked ‘use by’ dates with “unsafe” in Article 14 of the General Food Law. The determination of whether a product is “unsafe” should be risk-based. For example, when determining whether a food is injurious to health the immediate/short-term/long-term health effects and any probable cumulative toxic effects of the product should be taken into account whilst taking into account any particular health sensitivities of vulnerable groups. This is carried out in the form of a risk-assessment. Directly linking ‘use by’ dates to the legal provision on “unsafe” food creates the presumption that a product past its ‘use by’ date is unsafe. This is not coherent with the risk assessment principle in Article 14 of the General Food Law. Declaring a product as “unsafe” due to an expired ‘use by’ date is no longer risk-based but rather legalistic. The safety of a product should be measurable, the risks should be quantifiable.

This addition was not in the initial proposal for the Food Information Regulation (see Annex II). It is unclear why it was entered. The finding that manufacturers generally tend to be over-cautious and incorporate safety margins when setting dates makes this addition illogical. It is therefore highly unlikely that a product will be an immediate danger to human health the day after the 'use by' date. In addition, non-prepackaged products which are highly perishable are not required to have a 'use by' date and therefore also fall out of the scope of being "unsafe" due to an expired 'use by' date.

The choice of wording for this requirement is interesting: after the 'use by' date a food shall be *deemed* [emphasis added] to be unsafe in accordance with Article 14(2) to (5) of Regulation (EC) No 178/2002. The phrase 'deemed to be' is similar to 'considered to be' which is different from whether something actually 'is' unsafe. In addition, by not specifying whether a product past its 'use by' date is unsafe due to it being injurious to health or unfit for human consumption another dimension is added. Injurious to health is related to the effects a product has on the human body whilst unfit for human consumption is related to the condition of the product itself. 'Use by' dates are assigned to products which are highly perishable and therefore likely after a short period of time to constitute an immediate danger to human health. Therefore, it would seem logical that a product with an expired 'use by' date would be deemed unsafe as it would be injurious to health.

## 6.5 Limitations

This study had the following limitations:

### Sample size

The sample size was relatively small. The interviews were qualitative, rather than quantitative. The interviews were carried out with a cross-section of organisations and businesses which gave an overview of how date labelling is carried out in practice. However, this limited the comparisons which could be made. Interviews were carried out with various food business sectors; dairy, meat and ambient/stable products, which highlighted the differences between various food industries. However, due to the limited number of interviews carried out the results of this study are not representative of the food industry. The companies interviewed were multi-national and national companies. Interviewing a range of businesses from multi-national companies to small and medium enterprises could highlight different challenges faced and different priorities with regards to date labelling. For example, multi-national companies have all the expertise in-house and greater resources for carrying out shelf life testing. A family-run business on the other hand may have limited resources and expertise.

### Focused on Netherlands

This research project focused mainly on the Netherlands, in particular national legislation, the Dutch enforcement body (NVWA), national trade organisations and food manufacturers in the Netherlands. This study therefore only provides an insight into how date labelling is interpreted and implemented in the Netherlands. Further research could be carried out in other countries to form a comparison on how the date labelling requirement is interpreted and implemented in other countries in the EU.

## Chapter 7: Conclusions & Recommendations

### 7.1 Conclusions

Regulation (EU) No 1169/2011 requires foodstuffs to bear a durability date. The Regulation distinguishes between two date indicators; a 'use by' date for products which from a microbiological point of view are highly perishable and can therefore pose an immediate danger to human health and a 'best before' date which is linked to the specific properties of a product. It is clear in legislation that the 'use by' date indicates up till when the product is safe to consume. The 'best before' date on the other hand is not directly linked to safety. It indicates up till when a product will remain completely fit for human consumption and retain its specific qualities such as freshness and flavour. From a legislative point of view 'use by' dates are a safety indicator.

In practice, the food industry sets 'use by' dates where the quality of the product starts to deteriorate. This is due to quality deteriorating before safety in a number of cases. This date indicator is therefore removed from the safety risks. The 'use by' date acts primarily as a quality indicator and secondary as a safety indicator. Food deteriorates overtime and as such a date mark will not provide the absolute shelf life of a product. Manufacturers factor a margin of safety into 'use by' dates. This is justifiable as the manufacturer cannot guarantee that the product will be stored correctly by retailers or in the consumer's home and it is the manufacturer who is responsible for the safety of the product until the 'use by' date expires. Quality margins on the other hand appear to be for commercial reasons and as such put into question whether 'best before' dates are really necessary.

It is important to note that a 'use by' date is not the only indicator that will not protect the consumer from adverse health effects. The consumer has the responsibility to follow the instructions for use of the product; to store and prepare the product according to the guidelines provided.

There is clearly a gap between how the date indicators are differentiated in legislation and how these are being used in practice. If both 'use by' dates and 'best before' dates are set when quality deteriorates then there is no meaningful distinction between the two date indicators. If the 'use by' date is set too far away from the safety risks then the 'use by' date is not being used for what it was intended for.

The Food Information Regulation deems a product with an expired 'use by' date to be "unsafe" in terms of Article 14 of the General Food Law. There is no distinction made as to whether a product with an expired 'use by' date is injurious to health or unfit for human consumption. This opens up the possibility that it could be either. However, both definitions for "unsafe" relate to very different elements. 'Injurious to health' is about the effects a product can have on the human body, whereas 'unfit for human consumption' is about the condition of the product.

'Use by' dates are foremost being applied in practice to quality indicators. Therefore, linking 'use by' dates to the legal provision of "unsafe" is illogical. This link clearly distinguishes that these products are to be considered unsafe. If date labelling was being used in its purest form then this link may be reasonable as it clearly distinguishes that these products are to be considered unsafe. However, this

approach does not take into account how food labelling is applied in practice and therefore products are deemed “unsafe” by legal definition.

## 7.2 Recommendations

### **Recommendation 1: Remove “unsafe” requirement from ‘use by’ dates**

The Food Information Regulation deems food with an expired ‘use by’ date to be “unsafe” within the meaning of Article 14 of the General Food Law. However, ‘deterioration in quality often precedes deterioration in safety’ (Local Better Regulation Office 2011, p.7) and therefore an expired ‘use by’ date does not automatically mean the product is unsafe for consumption. This raises issues with the enforcement of this requirement. Many enforcement officers presume that products with an expired ‘use by’ date are an immediate danger to human health (Local Better Regulation Office 2011, p.16). This assumption is based on the Regulation being correctly applied in practice i.e. that products which fit the definition of ‘highly perishable’ etc. are given a ‘use by’ date. Enforcement actions may therefore be disproportionate to the risk as these expired products may not pose an immediate danger to human health and therefore the enforcement action is based on a theoretical risk. The regulatory regime is misdirected as a food labelling requirement is being used to resolve a perceived food safety issue. A report conducted for the Local Better Regulation Office on the regulation and enforcement of ‘use by’ date labelling made this recommendation in 2011. The report called for a ‘fundamental change in the approach to the legislative controls over date labelling for food safety purposes’ (Local Better Regulation Office 2011, p.1). The review group urged that their findings would be used to inform the dates debate which was currently happening at a European level regarding the introduction of this condition in the Food Information Regulation, to ensure that the UK position was not replicated in any future EU regulation. The review group stated that they would be ‘extremely concerned should the UK Government or indeed other member states support such a position’ (Local Better Regulation Office 2011 p.18). It is unnecessary to deem a product with an expired ‘use by’ date as “unsafe” when the General Food Law already forbids food to be on the market which is unsafe. The requirement that food is deemed “unsafe” when the ‘use by’ has expired should be removed.

### **Recommendation 2: Ensuring correct use of ‘use by’ dates - *Listeria* + ready-to-eat foods**

In practice, ‘use by’ dates can reflect a product’s optimum quality and not its microbiological safety; ‘where quality will deteriorate before this maximum safe life, the ‘use by’ date will be brought forward’ (Local Better Regulation Office 2011, p.11). In addition, dates usually include a safety margin. To avoid the safety message of ‘use by’ dates being diluted it is important that the food industry are only applying ‘use by’ dates when strictly necessary. Therefore, only products which are highly perishable and constitute an immediate danger to human health after a short period should receive a ‘use by’ date. ‘Use by’ dates may not be the most effective indicator of food safety, however, they could be used as a ‘useful preventive tool’ for some foodborne pathogens such as *Listeria monocytogenes* which can grow in chilled ready-to-eat foods (NRDC 2013, p.20). For the majority of foodborne pathogens ‘the duration of refrigerated storage time is not a major factor in foodborne illness’ (NRDC 2013, p.20). *Listeria* is an exception as the organism can still grow and multiply under refrigerated conditions in food contaminated with *Listeria*. Therefore, the duration of refrigerated time is of importance with *Listeria*. *Listeria* is destroyed by cooking; therefore, this risk is mainly related to ready-to-eat foods. In addition, ‘serious illness from *Listeria* occurs almost exclusively in susceptible populations like the elderly, those with compromised immune systems,

and babies *in utero*' (NRDC 2013, p.21). The Dutch guidelines on when a 'use by' date should be applied indicates which products are highly perishable. Products which fall outside the scope of these guidelines should receive a 'best before' date.

### **Recommendation 3: "Smart labels"**

Manufacturers are over-cautious when applying durability dates as they are primarily responsible for ensuring their products are safe when consumed. However, manufacturers do not have control over the whole food chain and as such are applying a margin of safety to durability dates. If a product is incorrectly stored once it has left the factory then pathogenic bacteria may grow and a date label becomes meaningless as a safety indicator. One way to address this issue is with "smart labels". "Smart labels" is a technological solution which indicates the actual storage history of a product (NRDC 2013, p.25). An example of this is a "Time-Temperature Integrator" (TTI) which is 'a small tag attached to a food product that changes colour as a function of time-temperature history' (NRDC 2013, p.25). Manufacturers could place an instruction on a product to use by a particular date unless the TTI tag changes colour. This technology would be particularly beneficial to use on those foods that pose a high risk to consumer health, such as ready-to-eat foods. This option is currently very expensive however a technological solution could be the solution.

## References:

Besluit van 10 december 1991, betreffende Warenwetbesluit Etikettering van levensmiddelen. Staatsblad 1992, nr. 14. Zoals laatst gewijzigd bij de Wet van 17 April 2012. Staatsblad 2012, nr. 193.

Besluit van 10 december 1992, houdende vaststelling van het warenwetbesluit Bereiding en behandeling van levensmiddelen. Staatsblad 1992, nr. 678. Zoals laatst gewijzigd bij de Wet van 3 April 2013. Staatsblad 2013, nr. 146.

Besluit van 3 oktober 2005, houdende vaststelling van het Warenwetbesluit hygiëne van levensmiddelen. Staatsblad 2005, nr. 517. Zoals laatst gewijzigd bij de Wet van 3 February 2014. Staatsblad, 2014 nr. 81.

CODEX, 1985. CODEX STAN 1-1985: General Standard for the Labelling of Prepackaged food.

CODEX Alimentarius Commission, 2013. *Discussion paper on issues related to Date Marking (Prepared by New Zealand)*. CX/FL 13/41/8. Joint FAO/WHO Food Standards Programme Codex Committee on Food Labelling 41st Session. Charlottetown, Prince Edward Island, Canada, 14-17 May 2013.

Commission Regulation (EC) No 2073/2005 of 15 November 2005 on microbiological criteria for foodstuffs.

Commission Regulation (EC) No 589/2008 of 23 June 2008 laying down detailed rules for implementing Council Regulation (EC) No 1234/2007 as regards marketing standards for eggs.

Council Directive 79/112/EEC of 18 December 1978 on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs for sale to the ultimate consumer.

Council Directive 89/395/EEC of 14 June 1989 amending Directive 79/112/EEC on the approximation of the laws of the Member States relating to labelling, presentation and advertising of foodstuffs for sale to the ultimate consumer.

Council of the European Union, 2010a. Interinstitutional File: 2008/0028 (COD) Brussels 2 March 2010.

Council of the European Union, 2010b. Interinstitutional File: 2008/0028 (COD) Brussels 3 June 2010.

Council of the European Union, 2010c. Interinstitutional File: 2008/0028 (COD) Brussels 9 July 2010.

Council of the European Union, 2010d. Interinstitutional File: 2008/0028 (COD) Brussels 29 September 2010.

Council of the European Union, 2010e. Interinstitutional File: 2008/0028 (COD) Brussels 25 October 2010.

Directive 2000/13/EC of the European Parliament and of the Council of 20 March 2000 on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs.

Council of the European Union, 2010f. Interinstitutional File: 2008/0028 (COD) Brussels 12 November 2010.

Ellis, M.J., and Man., C.M.D., 2000. The Methodology of Shelf-Life Determination. In: D. Man, and A. Jones, ed. 2000. *Shelf-Life Evaluation of Foods*. 2<sup>nd</sup> ed. United States of America: Aspen Publishers. Ch.2.

Eurocommerce and FoodDrinkEurope, 2013. *Guidance on the Provision of Food Information to Consumers*. [pdf] Available at: <<http://www.fooddrinkeurope.eu/S=0/publication/guidance-on-the-provision-of-food-information-to-consumers/>> [Accessed 5<sup>th</sup> May 2014].

European Economic and Social Committee, 1986. Opinion on the proposal for a Council Directive amending Directive 79/112/EEC on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs for sale to the ultimate consumer. 86/C 328/11.

European Parliament, 2012. *Sale of food at reduced prices after expiry date*. E-009356-12. Available at: <<http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-%2f%2fEP%2f%2fTEXT%2bWQ%2bE-2012-009356%2b0%2bDOC%2bXML%2bV0%2f%2fEN&language=EN>> [Accessed 1 November 2013].

European Parliament, 2013a. *Consumption and distribution of foodstuffs past their 'best before' date*. E-009999-13. Available at: <<http://www.europarl.europa.eu/sides/getDoc.do?type=WQ&reference=E-2013-009999&language=EN>> [Accessed 1 November 2013].

European Parliament, 2013b. *Extending food product expiry dates*. E-007654-13. Available at: <<http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-%2f%2fEP%2f%2fTEXT%2bWQ%2bE-2013-007654%2b0%2bDOC%2bXML%2bV0%2f%2fEN&language=EN>> [Accessed 1 November 2013].

European Union, 2013. European Union Comments CODEX Committee on Food Labelling 41st Session Charlottetown, PEI, Canada, 14 - 17 May 2013. Agenda item 6 – Discussion paper on issues related to date marking. [pdf] Available at: <[http://ec.europa.eu/food/fs/ifsi/eupositions/ccfl/archives/ccfl41\\_comment\\_item\\_6.pdf](http://ec.europa.eu/food/fs/ifsi/eupositions/ccfl/archives/ccfl41_comment_item_6.pdf)> [Accessed 4th March 2014].

FoodDrinkEurope, 2013. *Food manufacturers & retailers launch Guidance for food business operators on EU labelling rules*. [online] Available at: <<http://www.fooddrinkeurope.eu/S=0/news/press-release/food-manufacturers-retailers-launch-guidance-for-food-business-operators-on/>> [Accessed 5 May 2014].

Gill, S., 2013. *Have you started preparing for 2014 yet?* [online] FoodCom Issue 6 Nov/Dec 2013 Available at: <<http://www.leatherheadfood.com/UserFiles/pdfs/foodcom/FoodCom-November-December-2013.pdf>> [Accessed 10 June 2014].

Hagenmeyer, M., 2012. Food Information Regulation: commentary on Regulation (EU) No. 1169/2011 on the provision of food information to consumers. Berlin: Lexxion.

Henson, S., and Traill, B., 1993. The demand for food safety: market imperfections and the role of government. *Food Policy* [e-journal] 18(2), p.152-162. Available through: Wageningen University Library website <[library.wur.nl](http://library.wur.nl)> [Accessed 26 September 2013].

Iglesias, M., n.d. *Puddle of milk*. [painting] Available at: <<http://www.miglesiasart.com/liquids.html>> [Accessed 17 March 2014].

Kilcast, D., and Subramaniam, P., 2000. The stability and shelf life of food. Cambridge: Woodhead Publishing Ltd.

Local Better Regulation Office, 2011. *Better Regulation of 'Use by' Date Labelled Foods*. [pdf] s.l.: Better Regulation Delivery Office. Available at: <[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/262575/11-1474-use-by-dates-report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/262575/11-1474-use-by-dates-report.pdf)> [Accessed 5 March 2014].

Luning, P.A., and Marcelis, W.J., 2006. A techno-managerial approach in food quality management research. *Trends in Food Science & Technology* [e-journal] 17, p.378-385. Available through: Wageningen University Library website <[library.wur.nl](http://library.wur.nl)> [Accessed 5 September 2013].

Luning, P.A., and Marcelis, W.J., 2009. *Food quality management*. Wageningen: Wageningen Academic Publishers.

Man, D., 2002. *Food Industry Briefing Series: Shelf Life*. Oxford: Blackwell Science Ltd.

Milne, R., 2013. Arbiters of waste: date labels, the consumer and knowing good, safe food. *The Sociological Review* [e-journal] 60, p.84-101. Available through: Wageningen University Library website <[library.wur.nl](http://library.wur.nl)> [Accessed 27 November 2013].

Mröhs, A., 2000. Durability indication: European Union. In: J.R. Blanchfield, ed. 2000. *Food Labelling*. Cambridge: Woodhead Publishing Limited. Ch.6.

Natural Resources Defence Council (NRDC), 2013. *The Dating Game: How Confusing Labels Land Billions of Pounds of Food in the Trash*. [pdf] New York: Natural Resources Defence Council. Available at: <<http://www.nrdc.org/food/files/dating-game-report.pdf>> [Accessed 5 March 2014].



NVWA, n.d. HACCP. *Overzicht hygiënecodes*. [online] Available at: <<http://www.vwa.nl/onderwerpen/regels-voor-ondernemers-eten-en-drinken/dossier/haccp/overzicht-hygienecodes>> [Accessed 20th February 2014].

Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.

Regulation (EC) No 852/2004 of the European Parliament and of the Council of 29 April 2004 on the hygiene of foodstuffs.

Regulation (EC) No 853/2004 of the European Parliament and of the Council of 29 April 2004 laying down specific hygiene rules for on the hygiene of foodstuffs.

Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers, amending Regulations (EC) No 1924/2006 and (EC) No 1925/2006 of the European Parliament and of the Council, and repealing Commission Directive 87/250/EEC, Council Directive 90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC of the European Parliament and of the Council, Commission Directives 2002/67/EC and 2008/5/EC and Commission Regulation (EC) No 608/2004.

Robertson, G.L., 2010. Food Packaging and Shelf Life. In: G.L. Robertson, ed. 2010. *Food Packaging and Shelf Life: A Practical Guide*. USA: CRC Press. Ch.1.

Smedley, P.J., 2000. The Hazard Analysis Critical Control Point (HACCP) System. In: D. Man, and A. Jones, ed. 2000. *Shelf-Life Evaluation of Foods*. 2<sup>nd</sup> ed. United States of America: Aspen Publishers. Ch.5.

USDA, 2013. Report of the United States Delegate To The 41st Session of the Codex Committee on Food Labelling. Available at: <<http://www.fsis.usda.gov/wps/portal/fsis/topics/international-affairs/us-codex-alimentarius/recent-delegation-reports/delegate-report-41st-session-ccfl>> [Accessed 4th March 2014].

Van Boxstael, S., Devlieghere, F., Berkvens, D., Vermeulen, A., and Uyttendaele, M., 2014. Understanding and attitude regarding the shelf life labels and dates on pre-packed food products by Belgian consumers. *Food Control* [e-journal] 37, p.85-92. Available through: Wageningen University Library website <[library.wur.nl](http://library.wur.nl)> [Accessed 9 September 2013].

Verordening van het Productschap Zuivel van 13 november 2002, houdende voorschriften inzake etikettering en inhoudsmaten van melk en melk- en zuivelproducten (Zuivelverordening 2003, Melk en melk- en zuivelproducten). Vbbo. 2003, nr.14.

Voedsel en waren autoriteit, 2009. Houdbaarheidsdatum levensmiddelen voor bedrijven. Informatieblad 6 / 15 juli 2009. Available at: <<https://www.vwa.nl/actueel/infobladen-voor->

bedrijven-en-instellingen/bestand/12463/infoblad-6-houdbaarheidsdatum-levensmiddelen-voor-bedrijven> [Accessed 29 October 2013].

Walker, S.J., 2000. The Principles and Practice of Shelf-Life Prediction for Microorganisms. In: D. Man, and A. Jones, ed. 2000. *Shelf-Life Evaluation of Foods*. 2<sup>nd</sup> ed. United States of America: Aspen Publishers. Ch.3.

WRAP, 2010. Helping Consumers Reduce Food Waste – A Retail Survey 2011. [pdf] Oxon: Waste & Resources Action Programme. Available at:  
<<http://www.wrap.org.uk/sites/files/wrap/240412%20Retailer%20review%202011.pdf>> [Accessed 23 October 2013].

WRAP, 2011. Consumer insight: date labels and storage guidance. [pdf]. Oxon: Waste & Resources Action Programme. Available at:  
<<http://www.wrap.org.uk/sites/files/wrap/Technical%20report%20dates.pdf>> [Accessed 4 October 2013].

## Annex I: Legislative process introducing the 'use before' date

In March 1976 the Commission adopted the initial proposal for 79/112/EEC. This contained only the date of minimum durability to be given as 'will keep until...'. The European Economic and Social Committee in their opinion endorsed the principle of date marking. The Committee stated that manufacturers 'can forecast how foodstuffs will keep since they decide on the quality of the basic ingredients used and the manufacturing processes'. However, when the product leaves the factory 'how long foodstuffs then retain their specific properties will depend mainly upon the conditions under which they are stored and distributed' and this is not under the control of the manufacturer. Therefore, it is essential that the manufacturer states on the packaging the measures which need to be taken to preserve the foodstuffs. This enables the manufacturer to be 'in a position to determine, within an adequate safety margin, how long the foodstuff concerned will remain completely fit for human consumption and retain all its essential qualities (freshness, visual attractiveness, flavour, bacteriological quality, etc.)'. The adoption by the Commission of the amended proposal replaced the English text of 'will keep until' with the term 'best consumed by'. When the Directive was passed the date of minimum durability was defined as 'the date until which the foodstuff retains its specific properties when properly stored' and was to be indicated as 'best before...' or 'best before end...' (Directive 79/112/EEC Article 9(1)). The Directive also introduced that 'in the case of certain foodstuffs which, from a microbiological point of view, are highly perishable, Member States may require the words 'use before: ... to be indicated' (Directive 79/112/EEC Article 9(2)). Documents relating to the legal procedure for passing the Directive do not shed any light as to why this second date indicator was introduced. The legislative documents available do not provide any enlightenment. The Directive also stated that within a period of six years the Council, acting on a proposal from the Commission, would decide on the common date-indication for highly perishable foodstuffs.

In May 1986 the Commission adopted a proposal to amend Directive 79/112/EEC. The recital stated that 'the principles of the date of minimum durability should be generalised, and the manner of its indication standardised, with a view to avoiding errors on the part of consumers'. The proposal sought to remove the right to allow 'use before' dates for microbiologically highly perishable foodstuffs. The European Economic and Social Committee were not in agreement with this proposal as 'use before' dates had been adopted by a large majority of Member States 'to indicate the minimum durability of microbiologically highly perishable foodstuffs' (European Economic and Social Committee opinion 1986, 2.5.1). The Committee argued that:

*'The 'use before' formula would seem to have a number of advantages for consumers, the food industry and the inspection authorities. From the consumer's point of view it has the merit of greater force than the 'best before' formula and it highlights the perishability of certain foodstuffs. It has not posed any particular application problems for the industry and it has facilitated close monitoring of products that are sensitive from the health angle. The advantage for the inspection authorities is that the imperative nature of this method of indicating minimum durability makes it possible to prohibit the sale of a product once the date has been reached' (European Economic and Social Committee opinion 1986, 2.5.2).*

The Committee reasoned that 'if, as stated in the Explanatory Memorandum, 'use before' and 'best before' dates mean the same thing to the consumer, one solution would be to employ only the 'use before' formula' (European Economic and Social Committee opinion 1986, 2.5.3). However, they also indicated that this may have unwanted consequences such as there being a tendency to extend the minimum durability period of some products and highlighted that it may bring difficulty with selling products which have passed the date of minimum durability but which are still fit for consumption, therefore leading to a high level of waste (European Economic and Social Committee opinion 1986, 2.5.3). The Committee therefore proposed that the 'use before' date remained. Interesting to note is that the Committee also suggested that provisions should be adopted 'laying down standard conditions for the use of this indication (list of foodstuffs concerned — fixing of the period) with the threefold objective of improving consumer information as regards a, label indication which could have health implications, of offering greater legal certainty to the food industry and of facilitating trade'.

The European Parliament opinion on the 1<sup>st</sup> reading proposed that highly perishable from a microbiological point of view is indicated with the words '**consume by** ... at the latest'.

In May 1987, the Commission adopted the amended proposal which stated that the date of last consumption should be used for foodstuffs which from the microbiological point of view are highly perishable. This proposal included another addition:

#### *Article 9a*

*1. In the case of foodstuffs which, from the microbiological point of view, are highly perishable, and whose durability does not exceed seven days, the date of minimum durability shall be replaced by the date of last consumption.*

*2. The date shall be preceded by the words*

*"use before ...".*

This date would be followed by a description of the storage conditions which must be observed.

When Council Directive 89/395/EEC was passed it stated in its recital that:

*Whereas the date of minimum durability has proved its worth; whereas, however, **in the interests of a better protection of public health** a stricter system of dating should be used in preference thereto in the case of foodstuffs which, from the microbiological point of view, are highly perishable and **whereas in doubtful cases** a Community procedure should be laid down;*

This appears to be the justification given for introducing the 'use before' date.

## **Annex II: Legislative process linking ‘use by’ dates to Article 14 of Regulation 178/2002**

The relation of ‘use by’ dates to Article 14 of Regulation 178/2002 was not in original proposal from Commission, nor in 1<sup>st</sup> European Parliament reading.

2 March 2010 – Belgium and Slovakia wanted to add a definition of ‘use by’ date (Council of the European Union, 2010a).

3 June 2010 – proposal was to introduce ‘use by’ date as a definition: “use by” date means the date from the end of which a food shall be deemed to be unsafe in accordance with Article 14 of Regulation 178/2002 (Council of the European Union, 2010b). However, Denmark had reservations whilst Sweden, Austria and France had scrutiny reservations.

9 July 2010 – ‘use by’ date remained as a definition in the proposal, however, Sweden, Finland, Germany, France, Lithuania, Austria, Bulgaria, Italy and Denmark did not see the need for a definition (Council of the European Union, 2010c).

29 September 2010 – ‘use by’ date was deleted from the proposal (Council of the European Union, 2010d).

25 October 2010 – Romania had a scrutiny reservation on the deletion of ‘use by’ date as a definition (Council of the European Union, 2010e). RO: scrutiny reservation on the deletion of: “‘use by’ date’ means the date from the end of which a food shall be deemed to be unsafe in accordance with Article 14 of Regulation 178/2002. The proposal was amended to include ‘after the ‘use by’ date a food shall be deemed to be unsafe in accordance with Article 14 (2) to (5) of Regulation 178/2002’ in Article 25 on Minimum durability date. Denmark, Romania and Sweden had scrutiny reservations on this.

12 November 2010 – political agreement was reached and ‘after the ‘use by’ date a food shall be deemed to be unsafe in accordance with Article 14 (2) to (5) of Regulation 178/2002’ was added to the Commission’s proposal to the European Parliament (Council of the European Union, 2010f).

21 February 2011 - Council’s common position included ‘use by’ being linked to Article 14 of Regulation (EC) 178/2002.