



# **Market study on date marking and other information provided on food labels and food waste prevention**

Final Report

Written by ICF in association with Anthesis, Brook Lyndhurst, and WRAP

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E-mail: [sante-consult-e1@ec.europa.eu](mailto:sante-consult-e1@ec.europa.eu)

European Commission

B-1049 Brussels

**Market study on date  
marking and other  
information provided on food  
labels and food waste  
prevention**

Final Report

Directorate-General for Health and Food Safety

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## Glossary

Term	Meaning
Available life	The period of time remaining on a product at a given stage in the supply chain
Avoidable food waste	Edible materials of a food product that could have been consumed but become waste for various reasons.
Company brand	A brand owned by a food manufacturer
Defra	UK Department of Environment, Food and Rural Affairs
EU 28	The 28 Member States of the European Union
FAO	Food and Agriculture Organization of the United Nations
FBO	Food Business Operator – for example, a company that produces or retails food, or an organisation that operates a food bank
FIC Regulation	Regulation (EU) No 1169/2011 of the European Parliament and of the Council on the provision of food information to consumers
Food waste	A general term comprising of avoidable and unavoidable food waste.
FUSIONS	Food Use for Social Innovation by Optimising Waste Prevention Strategies, a multi-stakeholder platform
LBRO	Local Better Regulation Office
MAP	Modified Atmosphere Packaging
Minimum Life On Receipt (MLOR)	The amount of life remaining on a product on receipt into a retailer's depot. Retailers use MLOR to assess whether the available life remaining on a product when delivered to retail depot is sufficient for retail and consumer stages.
MS	Member State(s)
Mt	Million tonnes
NACE codes	«nomenclature statistique des activités économiques dans la Communauté européenne» : Statistical classification of the economic activities in the European Community
NCA	National Competent Authority
Open Life	The period that a product should be consumed within once open, e.g. 'once opened consume within x days', as specified on an information label on the product packaging
POS	Point Of Sale

<b>Term</b>	<b>Meaning</b>
PRODCOM	"PRODUCTION COMMUNAUTAIRE" (Community Production): statistics on the production of manufactured goods
Product life or Shelf life	The length of time a product may be stored unopened, in accordance with storage advice, without becoming unsuitable for consumption, with regards to food safety and/or quality.
REFRESH	Resource Efficient Food and Drink for the Entire Supply Chain, EU Horizons 2020 project
Retailer's own brand	A brand owned by a food retailer
RDC	Regional Distribution Centre, retailer depot that supplies stores within a region
SKU	Stock Keeping Units
Total life	The length of time a product may be stored without becoming unsuitable for consumption. (NB, it is not the same as the "maximum life", which is the technical maximum product life that could be set without compromising food safety.)
Unavoidable food waste	Inedible materials that become waste when the product is used/consumed. In food manufacturing this may also include the edible fraction of non-recoverable materials in manufacturing processes.
WRAP	Waste and Resources Action Programme



## **Abstract**

European law (Regulation (EU) No 1169/2011 on Food Information to Consumers (the "FIC Regulation")) requires that most pre-packed foods display a date mark and accompanying wording that explains whether the date signals a threshold in the product's safety ("use by") or its quality ("best before"). The date mark is intended for use by consumers but also informs food chain operations, examples being retailers' stock management and food redistribution systems.

This study has been carried out to help inform actions of the European Union (EU) to prevent food waste, as part of the Circular Economy Action Plan. The study examined the practical application of EU date labelling legislation and its implications for food waste prevention. It involved: desk research on the use of date labels and their links to food waste in the supply chain and in the home, including a review of EU food waste data to identify the main categories of foods contributing to food waste; market research to collect and analyse date labels on 2,296 products of ten pre-defined food product types (pre-prepared fruit/ vegetables, pre-packed sliced bread, chilled fish, sliced ham, fresh milk, yoghurts, hard cheese, chilled fresh juice, pre-prepared chilled pasta, and sauce (ketchup) that were purchased during 109 retail store visits in eight EU Member States (Germany, Greece, Hungary, the Netherlands, Poland, Slovakia, Spain and Sweden); and consultations with food businesses, national regulators and other stakeholders on their understanding and application of relevant aspects of the FIC Regulation.

The study estimates that up to 10% of the 88 million tonnes of food waste generated annually in the EU are linked to date marking. The main food categories contributing to food waste were fruit and vegetables, bakery products, meat including fish and poultry, and dairy products.

The over-arching conclusion from the analysis of EU food waste data is that any proposals to reduce food waste by driving improvements to labelling practices should focus on those food product types for which the consumer decision to discard is likely to be informed by reading the on-pack label; and whose contributions to EU food waste is significant. Of food product types used in the market research, the greatest opportunities for prevention of food waste in relation to date marking exist for milk and yoghurts, fresh juices, chilled meat and fish. For other product types, the consumer decision to discard is more likely to be informed by visual cues that indicate a decline in product quality and palatability.

Interviewees showed high awareness of the FIC Regulation and its requirements, and the market survey showed a high level of compliance. Almost 96% of products sampled carried either a "best before" or "use by" date mark and accompanying wording that were in line with the provisions of the FIC Regulation. However, the legibility of date marks was judged to be poor on 11% of products sampled.

The market survey found variation in date marking practices within product types and among Member States. Of the ten product types sampled for this study, only sauce, sliced bread, and fresh juice had predominantly the same type of date mark in all eight Member States surveyed. The other product types tended to display a "use by" date mark in some Member States but a "best before" date mark in others. Some otherwise identical products manufactured by international brands displayed a "use by" date in one Member State and a "best before" date in another, and no significant difference was found between the average remaining life values for "use by" and "best before" labelled products of the same type. There was also wide variation in the storage and open life advice found on the same type of product.

Interviewees advised that the choice of date mark was influenced by different factors such as food safety and technology considerations, national customary practice, and company-specific factors. Shelf life is normally determined by safety and quality but other factors can affect the specified date, such as producers' expectations of how

consumers will store food, retail practices in relation to date marking and the supply chain's temperature regime for chilled foods in the country where the food will be sold.

The study recommendations call for the production of technical guidance for food businesses on how to: determine shelf life; choose between "use by" and "best before" date marks; specify storage advice and open life instructions; and examine opportunities for possible extension of product life. The study also calls for specific action by food producers to remedy the problem of illegible labels. Evidence from desk research and stakeholder interviews suggests that many consumers do not understand date marks, including the distinction between "use by" and "best before"; however, stakeholders were divided as to whether there would be merit in changing the terminology. There was also widespread support for pursuing consumer information campaigns on date marking, which the study authors advise should be informed by results of previous initiatives.

Further research is also needed regarding consumers' use of date marks and storage advice in order to help to inform future policy making.

## **Executive Summary**

### **Introduction**

European law (Regulation (EU) No 1169/2011 on Food Information to Consumers (the "FIC Regulation")) requires that most pre-packed foods display a date mark and accompanying wording that explains whether the date signals a threshold in the product's safety ("use by") or its quality ("best before"). The date mark is intended for use by consumers but also informs food chain operations, examples being retailers' stock management and food redistribution systems.

This study has been carried out to help inform actions of the European Union (EU) to prevent food waste, as part of the Circular Economy Action Plan. The study examined the practical application of EU date labelling legislation and its implications for food waste prevention.

The study's objectives were to:

- investigate food business operators' and national competent authorities' understanding and practices regarding information provided on food labels, especially date marking;
- assess the possible impact of these practices on food waste; and, in doing so,
- support the work of DG SANTE on date marking in relation to food waste prevention and, in particular, its dialogue with all actors on this issue.

The study was contracted to ICF by the Directorate-General for Health and Food Safety (SANTE) of the European Commission. ICF worked in close collaboration with Anthesis and was supported by experts from Brook Lyndhurst and the Waste and Resources Action Programme (UK).

### **Method**

The study involved:

- desk research on the use of date labels and their links to food waste in the supply chain and in the home, including a review of EU food waste data to identify the main categories of foods contributing to food waste;
- market research in the form of a survey that used a 'mystery shopping' format in which products of ten pre-defined types were purchased from selected stores in eight Member States (Germany, Greece, Hungary, the Netherlands, Poland, Slovakia, Spain and Sweden). In this survey:
  - the eight Member States were selected to capture the variation in purchasing patterns across the EU;
  - the product types selected were: pre-prepared fruit/ vegetables, pre-packed sliced bread, chilled fish, sliced ham, fresh milk, yoghurts, hard cheese, chilled fresh juice, pre-prepared chilled pasta, and sauce (ketchup);
  - the main factors in the selection of the product types were: the food category's overall contribution to EU-28 avoidable food waste; evidence of use of different types of date mark for the same product type; extent to which consumers may take into account date marks when deciding whether or not to discard particular products; and relevant issues identified for the products relating to open life guidance, storage for optimal product life, and home freezing advice;
  - 2,296 products from 1,058 brands were purchased in 109 store visits. Detailed specifications prepared for each product enabled comparisons in date marking and information practices to be made between products across different brands, retailers, and Member States.

- semi-structured telephone interviews with 39 Food Business Operators (FBOs) and 19 National Competent Authorities (NCAs) in the countries targeted by the market survey, plus 16 EU-level organisations representing food industry sectors, consumers and food bank operators. These interviews focused mainly on stakeholders' understanding of the FIC Regulation and its application.

### **Findings from the desk research**

Fruit and vegetables account for the highest proportion of avoidable food waste in the EU-28 across the manufacturing/processing, retail, food service, and household sectors: 16.2 million tonnes per year (Mt/yr), i.e., 33% of total avoidable food waste. This category is followed by bakery products (10.5Mt/yr, 21%); meat, including fish and poultry (4.8Mt/yr, 10%); and dairy products (4.7Mt/yr, 10%). No other category contributed more than 4.2Mt/yr or 8% of the total. Annual EU-28 food waste attributable to date marking issues was estimated at 6.9 Mt/yr - 8.9 Mt/yr across the manufacturing/ processing, retail and household sectors. This represents 5%, 55%<sup>1</sup> and 9.5-12% of the food waste from those three sectors, respectively. It was not possible to include the food service sector on the basis of data reviewed or to provide a breakdown by food product category. The value of 8.9 Mt/yr for food waste attributable to date marking issues approximates to 10% of the estimate for total food waste in the EU-28 (88 Mt/yr).

The over-arching conclusion from the analysis of EU food waste data is that any proposals to reduce food waste by driving improvements to labelling practices should focus on those food product types for which the consumer decision to discard is (already) likely to be informed by reading the on-pack label; and whose contributions to EU food waste is significant. Of food product types used in the market research, the greatest opportunities for prevention of food waste in relation to date marking exist for milk and yoghurts, fresh juices, chilled meat and fish. For other product types, the consumer decision to discard is more likely to be informed by visual cues that indicate a decline in product quality and palatability.

### **Findings from the stakeholder consultations and market survey**

#### **Use and choice of date marks**

The interviews showed a high level of awareness among FBOs and NCAs of the FIC Regulation, its requirements, and its intent in distinguishing between "use by" date marks and "best before" date marks. This is consistent with the key finding from the market survey that almost 96% of products sampled displayed a date mark and accompanying wording that were in line with the provisions of the FIC Regulation.

Nonetheless, the market survey found variation in date marking practices within product types and among Member States. Of the ten product types sampled for this study, only sauce, sliced bread, and fresh juice had predominantly the same type of date mark in all eight Member States surveyed. (Along with hard cheese, these were the product types for which more than 80% of products sampled displayed a "best before" date mark.) The other product types tend to display a "use by" date mark in some Member States but a "best before" date mark in others. Examples were even found of otherwise identical products manufactured by international brands displaying a "use by" date in one Member State and a "best before" date in another.

The stakeholder interviews provided insights into the causes of the differences observed among FBOs and across the EU. Interviewees also gave examples of products listed in Annex X of the FIC Regulation (which details food exempt from "best before" labelling obligations) which have a date mark where none is required.

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<sup>1</sup> For the retail sector this includes date expiry within stores.

Some **producers** take account of factors beyond the product characteristics when determining how to apply the FIC Regulation with respect to date marks. These include their perceptions of consumer knowledge of date labels. Some producers apply “use by” date marks to products (for which a “best before” date mark would be more appropriate) as a precautionary measure given the uncertainties about consumer handling of food. This is also due to differences in perceptions of what foods are considered to be ‘highly perishable’ in each market as well as retailer preferences for date marking.

**Retailers** tend to favour a consistent approach to date marking for each product type in each national market but are used to accommodating variation in labelling practice between national markets. The determination of the preferred type of label in each country is influenced by factors that include perceived expectations of consumers and, in some cases, guidance provided by a trade association or the relevant NCA.

Some **NCA**s provide interpretative guidance of date marks based on the FIC Regulation. There is variation among Member States in what this guidance entails. There are also examples of NCAs working to harmonise practices across countries (e.g. among Nordic countries).

### **Product shelf life/ setting of expiry date**

FBOs are responsible for the determination of products’ shelf life, as well as the choice of date mark, other than for eggs and poultry meat. The remaining shelf life (as measured by the gap between the date of purchase and the “use by” or “best before” date on the product) of products purchased in the market research was assessed. None of the 10 product types showed a statistically significant difference between the remaining life of products carrying “use by” and those carrying “best before” date marks. This suggests that date marks were being used interchangeably.

Interviews with FBOs and NCAs suggest that the declared shelf life is normally determined by safety and quality considerations (as informed by microbiological or sensory testing), and previous experience of a product or similar products. For some FBOs the product life testing also takes account of the variations among countries in retailers’ storage temperatures.

The interviews identified examples of retailers and suppliers working together to improve shelf life. FBOs prioritise food safety – and tend to act cautiously to take account of differences in storage conditions within the food supply chain and the ‘worst case’ scenarios for consumer or retail behaviour (e.g. chilled foods being stored in ambient conditions). This suggests that greater harmonisation might bring further benefits in allowing FBOs to extend shelf life safely and reduce buffers, taking account of varying storage conditions.

Concern about consumer perceptions of products can prevent firms from exploiting the potential for extension of shelf life provided by improved storage technology. For example, some products which have traditionally been sold as chilled products can now be safely stored at ambient temperatures (for example, fruit juice and certain cheeses). Producers may resist setting a longer shelf life for fear of undermining a product’s association with freshness and quality.

NCAs are generally not involved in providing technical guidance on product testing or setting shelf lives. The main reason given by NCAs for not providing such guidance is that setting the date is the producers’ responsibility (as only they can fully understand product formulation and issues of food quality and safety) and so the producers should continue to be accountable for the date setting choices that they make.

### **On-pack storage advice and open-life instructions**

The market survey found a wide range of storage advice on the sampled products, particularly in relation to the appropriate storage temperature for chilled products (which was expressed either as a maximum temperature or a temperature range). The

quoted storage temperatures tended to be lower than the standard maximum retail temperatures identified by interviewees as the norm for the relevant market. The storage advice in the same product group was often found to vary or even be contradictory across different markets, potentially leading to consumer confusion.

There was variation in prevalence of advice on open life. Such advice was provided on majority of fresh juice and pre-prepared chilled pasta products. It was least common on yoghurt, tomato sauce, hard cheese and sliced bread.

Interviewees acknowledged the lack of consistency in storage advice and open life advice. There was no consensus on what constituted good quality, non-mandatory advice on open life for consumers. The discussions suggested that FBOs' concern to avoid customer complaints and adjustments for factors such as consumer knowledge, and uncertainty about the conditions in which the product might be stored, led them to use formulations such as 'consume immediately' as a precautionary measure.

### **Legibility and layout of date mark and on-pack information**

Fieldworkers reported difficulty in reading date marks and/or the wording on 11% of the products sampled. The main problems were that the text was too small, the layout was unhelpful and the print quality was poor. For example, 20% of pre-prepared chilled pasta products had a date mark or associated wording that was unclear, as did 16% of sliced ham products and 13% of sliced bread. No interviewees mentioned specific problems with making dates legible, despite the difficulties faced during the fieldwork.

The market research found that the date wording and date mark were alongside one another on some packaging and appeared separately on others. In the latter case, the FIC Regulation requires the date wording to state where the date mark is displayed on the packaging (e.g., "best before: see date on cap" rather than just "best before:"). FBOs explained this variation by reference to historic practices in each market that governed the location of the date mark for certain product groups as well as limitations due to product format. FBOs did not see the separate location of date mark and date wording as a problem for consumer understanding; when asked, they stated that such layouts were standard and something that consumers were accustomed to.

### **Enforcement of compliance with FIC Regulation and guidance**

Most NCAs considered that the choice of date mark is the responsibility of FBOs and so not a matter for them to enforce. However, some NCAs and other actors (e.g. trade associations) actively tried to shift date marking practices when these have the potential to increase food waste. Examples are: attempts to harmonise storage conditions across the chilled food chain; support for stakeholder or cross-industry dialogue; guidance clarifying interpretation of "best before" or "use by"; and studies on consumers' understanding of date labels.

### **Donation of food past the "best before" date**

Interviews revealed a wide range of practices and legal frameworks governing the donation of food that has passed its "best before" date. Although allowed under EU rules, some Member States discourage or forbid this practice (e.g. Poland) while others encourage it (e.g. Italy). The local infrastructure for food distribution, including food banks and charity organisations, also influences FBOs' practices.

### **Possible further exemptions to date marking under FIC Regulation Annex X**

Annex X of the FIC Regulation lists food products that are not required to display a "best before" date mark. There was no consensus among those consulted on whether further exemptions in the FIC Regulation, based on evidence of consumer behaviour in relation to date marking, would be helpful in reducing food waste. Consumer expectations relating to the presence of information and a date mark played a part in this feedback.

## Conclusions

Based on the study's findings, the authors conclude that avoidable food waste linked to date marking is likely to be reduced where:

- a date mark is present, its meaning is clear and it is legible;
- consumers have a good understanding of date labelling (notably the distinction between "use by" – as an indicator of safety – and "best before" – as an indicator of quality);
- "use by" dates are used only where there is a safety-based rationale for doing so, consistent with the FIC Regulation;
- the product life stated on the packaging is consistent with the findings of safety and quality tests, and is not shortened unnecessarily by other considerations, such as product marketing;
- storage and open life guidance are consistent with the findings of safety and quality tests;
- there is a level of consistency in storage of food at retail and guidance for consumers regarding the temperatures at which products should be stored in the home.

## Recommendations

The study makes the following recommendations.

### **1. Technical guidance and support for dialogue within the supply chain would help to steer FBOs towards best practice in date labelling**

A number of issues identified in the research could be addressed by producing technical guidance and by giving support to dialogue within the supply chain. Such guidance, which is likely to be specific to food product categories, should be developed by a multi-stakeholder group and could be coordinated by the Commission through the EU Platform on Food Losses and Food Waste.

- ***Determination of shelf life and guidance on storage and open life advice***

The uncertainty among FBOs as to how best to determine shelf life and guidance on storage and open life could be addressed by technical guidance that takes into account food safety and technology considerations as well as best practice. NCAs, scientific bodies and trade associations could be consulted. Important areas for guidance include the assessment of possible risk to health and the determination of product shelf life and open life, taking account of safety and other factors. Where there are gaps in evidence, support for new research should be considered.

- ***Making a choice between "use by" and "best before" labels***

It would be beneficial to provide technical guidance on when a "best before" date mark could be used instead of a "use by" date mark without compromising product safety and consumer information. At present, local market conditions and inertia among FBOs may be limiting the potential for a consistent approach across Member States, as evidenced by conflicting information given on multilingual labels.

- ***Management of temperatures of chilled food in the retail supply chain***

The differences in management practices in the supply chain for chilled food among Member States that have an effect on producers' decisions about product shelf life could be addressed by guidance or regulations.

## **2. FBOs should be encouraged to act to address the problem of illegible date marks as a priority**

The legibility problems – poor print quality and ink retention, excessively small font size, layout, and colours that could not be distinguished against the background packaging, etc. – should be addressed by FBOs in partnership with retailers, and checked by NCAs as part of their monitoring of compliance with the FIC Regulation. These problems most commonly occurred when date marks were printed onto plastic film and plastic bottles. However, they may also occur when an “overlabel” displaying information, for instance in an additional language, is affixed to food packaging but is damaged.

Supplementary measures targeted at FBOs and the packaging sector that could help to address this problem are: an online resource that illustrates best practice for different packaging formats, considering layout, legibility and compliance with FIC requirements; and consultation with the packaging sector/ trade bodies on minimum ink adherence/ chemical compatibility for printing onto different materials, taking into account product life.

## **3. Further steps could be taken to help empower consumers to make informed choices**

This study did not involve direct consumer research but evidence and perceptions of consumer awareness and behaviours figured prominently in the desk research and in the stakeholder consultations.

- ***Improving coherence and consistency of food information to consumers***

The problem of inconsistent guidance from various sources, national laws and local practices, which may lead to increased food waste in the home or at the point of sale, is especially acute on multilingual packaging where information in one language, including maximum and minimum temperatures, open-life guidance, and even the date wording, may contradict information displayed in another. Thus there appears to be a need for stakeholder dialogue or further European guidance on this topic.

- ***Ensure that any new consumer education campaigns are informed by a synthesis of existing research evidence on consumer behaviour***

There is evidence that many consumers do not fully understand the distinction between “use by” and “best before” labels, and that this can contribute to edible food being discarded; however, stakeholders were divided as to whether there would be merit in changing the terminology. Many interviewees suggested that the European Commission should support consumer education campaigns on food waste prevention. However, before responding to calls for supporting consumer campaigns, it is recommended that relevant existing research evidence is collated and made available to inform the communication strategy. This synthesis could usefully be conducted at an EU level given the variable depth of evidence available in individual Member States.

- ***Research on consumer engagement with date labels and associated guidance in the home would help to inform future policy***

The evidence base on how to inform consumers and influence behaviour so as to avoid unnecessary food waste through use of “best before” and “use by” dates, storage advice and open life advice is comparatively weak. Support for further research in this area would help to inform future policy, including by exploring options to increase the impact of communications via graphic symbols or smart packaging.

## **4. Support efforts to extend product life**

- ***Guidance highlighting measures that increase product life***

There is evidence that discussions about the Minimum Life On Receipt between producers and retailers have helped to improve product life and reduce food waste by



encouraging investment in new technologies, such as innovative packaging and “clean rooms” (i.e., processing areas in which environmental pollutants are kept at very low levels by means of air filtration). NCAs and other stakeholders could highlight good practice or use guidance to encourage FBOs to consider extension of product life for certain foods.

#### **5. Address barriers to safe redistribution of food**

This study did not investigate barriers to food redistribution in-depth but the research did suggest scope to clarify the legal position and improve consistency of practice with regard to the sale or redistribution of food that has passed its “best before” date. (This would need to be specific to food product categories.) This recommendation could be considered within the scope of work commissioned by DG SANTE to support food redistribution in the EU.

## **1 Introduction**

### **1.1 This report**

This is the final report of a study that provides evidence on the use of date marking on packaged food products in the European Union. The work was undertaken by ICF<sup>2</sup> in association with Anthesis<sup>3</sup>. The core team was supported by experts from Brook Lyndhurst and the Waste & Resources Action Programme (WRAP).

### **1.2 Purpose**

Date marks were introduced by supermarkets in the 1970s to help ensure the freshness of food products and to assist with stock control. They are now additionally used on many food products to support these supply chain functions and to help consumers to make safe use of food with minimal waste. The use of date marks is governed by EU law.

There is strong evidence to suggest that consumers are confused by the information provided on food packaging (including date marking) and by the variation in how food businesses apply it<sup>4</sup>. There is further evidence connecting misinterpretation of date marks with food waste<sup>5</sup>. In that context, evidence on the nature and use of date marks could inform the specification of new measures to help consumers reduce the amount of food they waste and also to reduce food waste at earlier stages of the supply chain. Estimates reported of the share of household food waste in the EU that could be linked to date marking range from 15 to 33%.<sup>6</sup> Although estimates have been made of the amount of food wasted attributable to date labelling, these estimates are highly uncertain. Hence they have been subject to review by this study.

Reduction in food waste was identified by the Commission's Circular Economy Package as important to the creation of a more sustainable food supply chain and to achieve more efficient use of resources. This study is intended to contribute to that effort by providing evidence on:

- the understanding and practices of food business operators and national competent authorities with regard to date marking; and
- the possible impact of these practices on food waste.

The information gathered will help to inform the active dialogue among the European Commission, the food industry, national authorities and other stakeholders.

### **1.3 Method**

The method adopted for this study is explained in detail in Annexes 1, 2 & 3. (Annexes to this report are provided in a separate document.) The core components were:

- desk research on data on food waste in the European Union (EU);
- a mystery shopping exercise involving 109 store visits in eight Member States that sampled 2,296 products from 1,058 brands of 10 target product types; and
- interviews with food business operators and national regulators that examined the factors determining the specification of date marking for different food types and explored opportunities for food waste prevention.

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<sup>2</sup> [www.icf.com](http://www.icf.com)

<sup>3</sup> <https://anthesisgroup.com>

<sup>4</sup> Lipinski et al., 2013; Newsome et al., 2014; WRAP, 2010.

<sup>5</sup> Norden, 2016.

<sup>6</sup> Note from the Netherlands and Sweden to the Agriculture Council of the European Union, May 2014; WRAP, 2008

## **1.4 Structure of this report**

The remainder of this report is structured as follows:

- Section 2 describes the desk research to assess the evidence on EU food waste data and discusses the key findings that are most relevant to the process of selecting food product types to target in the fieldwork stages of research;
- Section 3 sets out the market research fieldwork undertaken and presents key findings;
- Section 4 presents findings from the stakeholder interviews;
- Section 5 presents the conclusions of the study based on the findings of the desk research, market research and interview programme;
- Section 6 presents the study recommendations.

## **2 Desk research**

### **2.1 Introduction**

This section assesses the evidence in the literature on the links between date marks and food waste. Forty three articles associated with food waste and evidence of possible links with date labels and other food waste drivers were reviewed<sup>7</sup>. The articles were produced by various public and private organisations from around the world, including food manufacturers, not-for-profit organisations, EU research projects and food labelling companies. Most did not relate to specific research undertaken on the direct effects that food labels have on food waste, either in the food chain or in the home. The review found that there is more quantitative evidence available on food retail and consumers than for manufacturing.

The most significant work on the causes of food waste in supply chains, including specific projects on date labelling and food waste has been undertaken by:

- The Nordic Council of Ministers, whose reports focus on processes involved in generating date labels for different food products or the impacts on consumers and retailers<sup>8</sup>.
- WRAP, which has examined links between food waste and date labelling in a series of report, and provides evidence on the role of date marks in the wider context of food waste reduction in the supply chain and with consumers<sup>9</sup>; and
- REFRESH (Resource Efficient Food and Drink for the Entire Supply Chain), an EU-funded research project that has reported on consumer behaviours relevant to food waste, including the confusion caused by date labels.

These sources make the most significant contributions to the results of the review.

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<sup>7</sup> Annex 2 provides full details of the references that were used in this review, identifying links between date marks and food waste.

<sup>8</sup> Examples are “Food Waste and Date Labelling” (Norden, 2016) and “Date labelling in the Nordic countries, Practice of legislation” (Norden, 2015)

<sup>9</sup> Examples are “Fruit and vegetable resource maps (WRAP, 2011a)”, “Reducing Food Waste through Retail Supply Chain Collaboration” (WRAP, 2011b), “Estimates of waste in the food and drink supply chain” (WRAP, 2013), “Reducing food waste by extending product life (WRAP, 2015)” and “Household food and drink waste – A product focus” (WRAP, 2014b).

## 2.2 Date-marking practices in the EU food chain

### ***Date marking requirements are defined in EU law***

Variation in date marking across the EU can be attributed to differences within the EU in the interpretation and application of the terms of the FIC Regulation. The FIC Regulation requires:

- food labelling to bear a date mark, and that marked date to be identified as a date of minimum durability (i.e., a “best before” date) or a “use by” date<sup>10</sup>;
- foods “*which, from a microbiological point of view, are highly perishable and therefore likely after a short period to constitute an immediate danger to human health*” to be marked with a “use by” rather than a “best before” date<sup>11</sup> – although it does not identify these foods;
- where appropriate, food labelling to include a description of storage conditions<sup>12</sup>.

Foods that are not required to bear a “best before” date mark<sup>13</sup> are identified in Annex X of the FIC Regulation. They are:

- fresh fruit and vegetables which have not been peeled, cut or similarly treated – including potatoes, excluding sprouting seeds and similar products such as legume sprouts;
- wines of various kinds;
- beverages containing 10% or more by volume of alcohol;
- bakers’ or pastry cooks’ wares “*which, given the nature of their content, are normally consumed within 24 hours of their manufacture*”;
- vinegar;
- cooking salt;
- solid sugar;
- confectionary products consisting almost solely of flavoured and/or coloured sugars;
- chewing gum and similar chewing products.

Some EU countries, such as the Netherlands and Sweden, have proposed that Annex X be amended to include more food products. The proposed additions are products with a long shelf life, such as coffee, pasta and rice (Food Navigator, 2016). Any such changes would require agreement at EU level.

### ***There is some evidence that the requirements are not applied consistently by food business operators***

Research has found variation in how food and drink manufacturers and suppliers meet the legal requirements for date marking. For example, one project<sup>14</sup> examined the use of “best before” and “use by” in date labels by 64 food and drink companies in

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<sup>10</sup> From Regulation (EU) no 1169/2011, Article 9(1)(f)

<sup>11</sup> From Regulation (EU) No 1169/2011, Article 24(1)

<sup>12</sup> From Regulation (EU) no 1169/2011, Article 9(1)(g)

<sup>13</sup> From Regulation (EU) No 1169/2011, Annex X, point 1(d)

<sup>14</sup> Norden (2015). 64 food and drink companies, representing 87 products, were surveyed. The researchers conducted surveys and in-depth interviews with the companies to identify how date labels used and shelf life are determined within the industry.

four Nordic countries as part of research into use of date labels and shelf life. It found differences in use of date labelling and in the specified shelf life within the sample of products (Table 1). The authors concluded that there is a need for a better understanding and guidance on food labelling terms. In the UK this challenge has been addressed by the Department for the Environment, Food & Rural Affairs and the Food Standards Agency producing guidance documents on how the FIC regulations should be implemented to help businesses comply with the law (Department for Environment, Food & Rural Affairs (Defra) and Food Standards Agency, 2016).

Table 1. Research with Nordic food and drink manufacturers found variation in date labelling practices and shelf life specification

Product	Key findings
Fresh milk, pasteurised.	<ul style="list-style-type: none"> <li>All products used the “best before” label</li> <li>The same product from different manufacturers showed differences in shelf life, with some being labelled with a date twice as long as other products in the same category</li> </ul>
Cold smoked sliced salmon, vacuum packed. Cooked ham, MAP-packed <sup>15</sup> . Warm smoked ham, MAP-packed. Ready-to-eat salad, containing heat-treated chicken. Ready-to-eat sandwich, containing chicken	<ul style="list-style-type: none"> <li>Difference in the use of labelling across the four Nordic countries: “best before” labelling was used extensively by Swedish manufacturers for cold smoked salmon due to established practice &amp; legislative guidance, as well as by Danish and Swedish manufacturers for cooked as well as warm smoked ham</li> <li>The same product from different manufacturers showed differences in shelf life, with some being labelled with a date twice as long as other products in the same category</li> </ul>
Minced beef without water and salt, MAP-packed.	<ul style="list-style-type: none"> <li>The same product from different manufacturers showed differences in shelf life, with some being labelled with a date three times as long as other products in the same category</li> </ul>

Source: Norden (2015)

**Managing date marks within a complex and varied retail environment is an ongoing challenge for the sector**

A large supermarket store may have 3,500 “use by” dated product lines, and around 50,000 individual items with a “use by” date for sale at any one time<sup>16</sup>. Managing the stock to ensure the products on display have not exceeded their “use by” date is a significant logistical challenge. Many retailers are embracing new printing technologies to improve use of labelling and reduce food waste.

Strategies for managing stock in relation to date labels need to accommodate the variation across the EU food retail sector in how some products are presented for sale. A product that is commonly presented ‘loose’ so that consumers can make their own selection in one country may be sold in packaged form in another country. Rules on date marks provided by the FIC Regulation can assist in the latter context but not in the former.

<sup>15</sup> Modified Atmosphere Packaging

<sup>16</sup> UK Local Better Regulation Office (“LBRO”), Business Reference Panel (2011).

The rapid growth of online shopping in many countries in Europe adds a new dynamic to date labelling and guidance. It is likely that online product information will become more important for consumers as online services grow. In the UK, for instance, online grocery sales reached £11.1 billion in 2017 (around 10% of total grocery sales (Defra, 2017)) and are projected to grow at around 11% per annum to £16.7 billion over the next 5 years (Mintel, 2017).

Very few of the food retailers that support online sales display information on their websites on "use by" or "best before" dates, or the product life remaining on arrival, for the products that are purchased online. Only one of the European retailers' online shopping platforms reviewed for this report enabled the customer to request a minimum "best before" date and indicated product life, i.e. number of days next to the image of the product.

### 2.3 Evidence on the links between consumer use of date marks and food waste

A number of in-depth studies have examined consumer understanding and use of date labels and of guidance on food and drinks produce. Most have used a combination of interviews and surveys of consumers but do not provide any quantitative data on the amounts of food waste generated. Findings of some of the principal relevant studies are summarised in Table 2.

Table 2. Existing studies indicate imperfect consumer understanding of date marks on food products

Key findings	Source	Country studied
Many consumers need better knowledge of the difference between "best before" and "use by"	Food waste and date labelling (Norden, 2016)	Norway, Sweden, Denmark and Finland
Consumer understanding of date labels vary widely dependent on the research Some stock control labels e.g. 'display until' dates may be misinterpreted by consumers	Consumer Insight: date labels and storage guidance (WRAP, 2011c)	UK
The reason most commonly given for discarding baked goods, sliced meat and yoghurt/sour cream was that it was "past its expiry date"	Food waste in Norway 2014 (Østfoldforskning, 2014)	Norway
58% of consumers consider "use by" and "best before" dates when shopping and preparing meals 47% of consumers understand "best before" labelling 40% understand "use by" date labelling	Flash Eurobarometer survey (Food Navigator, 2015)	EU
30% does not know difference between use by and best before labels Consumers' interpretation of the date mark varies according to food type	Understanding and attitude regarding the shelf life labels and dates on pre-packaged food products by Belgian consumers (Van Boxstael, S., 2013)	Belgium

The most direct evidence of the role that date labels play in the discard of food and drink waste in the home is from the kitchen diary data collected by WRAP in the UK<sup>17</sup>. Reasons linked to date labels accounted for a third of the 2 million tonnes of household food that became waste because it was 'not used in time' (i.e. 0.66 million tonnes (Mt)). The main food groups that contributed to avoidable food waste where householders cited the 'date label' as a factor contributing to the disposal of the food are shown in Table 3.

Table 3. For certain food products, the date mark is frequently cited by consumers as a reason for avoidable food waste

Food product	Percentage of avoidable food waste attributable to "date label"
Eggs	59%
Cakes and desserts	28%
Yoghurt	70%
Meat/fish	15%-31%
Cooking sauce	59%
Fruit juice and smoothies	18%

Source: WRAP, 2014b.

Other reasons cited by consumers for disposing of food were that:

- they had served too much;
- they had cooked or prepared too much;
- personal preference – they chose not to eat what had been prepared;
- accidents;
- the product was "not used in time" – instances where the date label was not cited.

In general, products that were 'not used in time' where the date label was not cited as a factor in them being thrown away were those:

- that had visual cues of deteriorating quality (vegetables/ fruit);
- that were of lower food safety concern (i.e. not subject to "use by" dates); or
- that are either sold loose or generally unpacked once in the home and therefore separated from the on-pack labelling information.

Examples are apples, cucumbers, bananas, lettuce/ leafy salad and standard bread<sup>18</sup>.

These findings provide a useful indication of the characteristics of food products for which date labels are most likely to be able to contribute to reduction of consumer food waste.

Other studies have explored consumers' understanding and use of storage and durability guidance. Norden (2016) provided specific examples of consumer guidance on storage and durability for different food products. These examples show some of the different terms used by manufacturers and retailers that can cause misunderstandings for consumers. The report concludes that consumers need clearer

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<sup>17</sup> WRAP, 2014b.

<sup>18</sup> WRAP, table 15: Reasons for disposal for avoidable food and drink waste by food type, 2014b



and more easily accessible information on different labelling, storage temperature and durability of products. A similar finding and recommendation was made in the WRAP 'Consumer Insight: date labels and storage guidance' report.

## **2.4 Determinants of product life and its impact on food waste**

The literature suggests that the "use by" or "best before" date specified on a food product is influenced by various considerations.

For some products, such as sliced ham, food safety is the limiting factor when setting product life. In other cases food manufacturers may specify a product life that includes a 'buffer' between the stated date on which the product should no longer be consumed and the actual date on which the product should no longer be consumed. Beyond the stated date, the product is still safe to eat but the quality is not optimal. This is a precautionary approach that is applied to product types where an obvious degradation in quality can cause consumers to dispose of items that are not yet unsafe to eat, such as yoghurt, cheese, juice, milk and salads<sup>19</sup>.

Other reasons for manufacturers to specify a product life that is shorter than necessary include:

- concern about the product being kept outside the recommended temperature in the home, during transport from store to home, or in the supply chain;
- limitations for brand reasons, i.e., setting the expiry date to be before any apparent degradation in quality.

Cautious consumer behaviour due to a lack of understanding and guidance regarding the safety and the quality of a product can therefore lead to the disposal of products despite goods still being fit for consumption.

Poor stock rotation of products with a shorter remaining shelf life can contribute to food waste in retail stores. If older products are hidden at the back of the shelf, with newer stock obscuring them, they are likely to be overlooked by the consumer. This practice can also lead to a larger quantity of products being sold closer to their expiry date and therefore having to be marked down in price, or being over-looked by store staff and so being disposed of rather than sold at a reduced price. Products with a short shelf life may also end up as food waste as a consequence of consumers specifically seeking out products with a longer shelf life.

### ***Extending product life can reduce food waste***

WRAP's study "Reducing food waste by extending product life" (2015) (WRAP, 2015) examines the impact of lengthening product life which may be brought about through product/packaging innovations, as well as setting appropriate expiry dates on products that may otherwise have unduly shortened shelf life. The study encompassed the impact of date marks across various supply chain stages and examined total life of a product, the open life, the available life and the Minimum Life on Receipt (MLOR) in relation to food waste<sup>20</sup>. The most relevant supply chain stages related to the delivery of product to the retailer regional distribution centre (RDC) from the supplier as well as at the retail store and the consumption of products in the home.

Within the supply chain the length of remaining life on a product delivered to the retailer is a key factor driven by the stock control function of date marks. The management of remaining life is important to ensure that the retail and ultimately the consumer ends up with a significant share of total remaining product life. However, the setting of unreasonable MLOR criteria may result in product returns and food

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<sup>19</sup> "Reducing food waste by extending product life", WRAP (2015).

<sup>20</sup> These terms are explained in the glossary at the front of this report.



waste. The use of MLOR might also mask failures in product ordering systems and allocation of consignments to their intended destinations or inefficiencies within delivery times between supplier and retailer.

MLOR is set by the retailer for products received from suppliers at regional distribution centres (RDCs). It can be a cause of food waste further back in the supply chain, due to product returns. MLOR is set with reference to the date on the date mark. Factors which influence MLOR specification include the supply chain performance, logistical challenges on the supplier side, the order quantity, delivery frequency, and the negotiating power of the retailer. Bread is perceived as having the highest MLOR with the requirement for delivered product to have at least 86% of date life remaining on delivery. Suppliers producing bread may deliver it in smaller batches and more frequently to the depot (i.e. daily) on order to maintain high MLOR. Chicken breast and lasagne, in comparison, have lower MLORs.

The main opportunities to extend product life and thereby reduce food waste are identified in a hotspot analysis summarised in Table A1.11 of Annex 1. This analysis sets date mark reforms within the wider context of a range of inter-related actions that contribute to food waste reduction: extension of the total product life, reform of the types of date marks used (for instance, elimination of “display until” or use of no dates). Some of these opportunities relate directly to the nature and duration of date marks applied, for example:

- removal of ‘display until’ dates (retailer stock control labels that have been shown to confuse consumers);
- variation in the application of “use by” and “best before” dates on certain products (e.g. yoghurt and juice) also has potential to cause waste by confusing consumers;
- potential to extend the product life, through innovation and reform of date labels applied to existing total life (through a reduction in buffer);
- extension of product life by reviewing the dates applied.

WRAP has produced the guidance documents and tools for the food manufacturing and retail industry to help them challenge existing product life and ‘open’ life on products<sup>21</sup>.

The WRAP 2015 study estimated the total benefits associated with product life extension through reduction in date expired product arising at manufacturing, retail and household stages. From WRAP’s programme of Waste Prevention Reviews, it was estimated that 5% of waste at the manufacturing stage was caused by date expired products. As producers are incentivised to move product through the supply chain to their customers as swiftly as possible, it is unlikely that much of the benefit of extended life would accrue to manufacturers and that retailers and consumers would benefit most.

Any reform of date marks and the extension of product life will have benefits in food waste reduction within the supply chain but these are likely to be modest compared with the benefits at the consumer end, particularly with respect to food products where the public have been shown to be more attentive to date marks.

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<sup>21</sup> Examples are: (a) A guide to help you and your business challenge existing product life and ‘open’ life (WRAP, 2016b). The guide is structured around 5 key stages; fact finding, opportunity identification, validation, implementation and review & embed. A worked example has also been produced (WRAP, 2016c) along with a template that is available on the WRAP website at <http://www.wrap.org.uk/content/extending-product-life-reduce-food-waste> ; and (b) A guide to help you and your business increase ‘available’ product life for consumers (WRAP, 2016d). This guide is structured for food manufacturing and the retail industry and focuses on improved performance in the supply chain.

Table 4. Estimates of retail waste prevented by adding one extra day to product life

Product type	Amount purchased by households in 2011 (tonnes)	Mean date expired losses at retail (% sales)	Estimated date expired losses at retail (tonnes)	Reduction in date expired losses from extending available life by 1 day (% sales)	Reduction in date expired losses from extending available life by 1 day (tonnes)
<b>Standard bread</b>	1,600,000	3.0	48,000	1.0	16,000
<b>Poultry (chicken) / turkey / duck</b>	820,000	4.3	35,260	0.9	7,380
<b>Pre-prepared meals</b>	428,000	5.3	22,684	0.9	3,852
<b>Fruit juice and smoothies</b>	1,100,000	0.4	4,400	0.01	110
<b>Milk</b>	5,100,000	0.5	25,500	0.1	5,100
<b>Potato</b>	1,600,000	1.3	20,800	0.3	4,800
<b>Lettuce and leafy salad</b>	170,000	5.5	9,350	1.6	2,720
<b>Sliced ham</b>	236,000	3.5	8,260	0.3	708
<b>Yoghurt / yoghurt drink</b>	479,000	1.4	6,706	0.1	479
<b>Total</b>	<b>11,533,000</b>	<b>1.5</b>	<b>180,960</b>	<b>0.3</b>	<b>41,149</b>

Source: WRAP (2015)

## 2.5 The products that contribute most to food waste in the EU

### 2.5.1 Introduction

This sub-section reports an attempt to use existing food waste datasets to identify the main food products that contribute to EU food waste at manufacture, retail, wholesale, food service and consumer/ household sectors<sup>22</sup>. This attempt uses the available food waste datasets for the EU-28 supplemented by data on food production, food availability and food consumption. These datasets were reviewed by an EU-funded research project called "FUSIONS" (short for "Food Use for Social Innovation by Optimising Waste Prevention Strategies", a multi-stakeholder platform) and are described in Annex 1, which provides a more detailed report of the analysis.

No primary data collection was involved in this desk-based review. As such, the outputs are constrained by the availability of data across the Member States, in a context where (i) the topic has had much more attention in some countries than in

<sup>22</sup> For the purposes of this review, losses associated with primary production were out of scope.

others, and (ii) data on food waste are not commonly collected as part of standard waste statistics.

### 2.5.2 Food product profiles for EU food waste

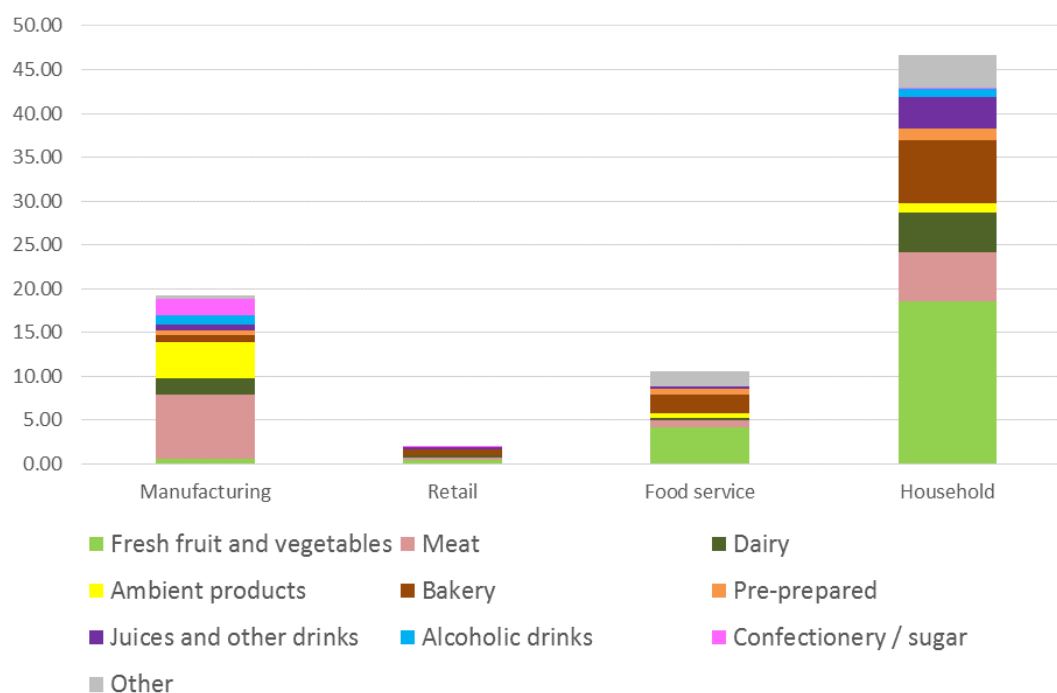
The FUSIONS project estimated that the EU-28 produce around 88 Mt of food waste per year<sup>23</sup>. Across the manufacturing, retail, food service and consumer/household sectors, fruit and vegetables account for the highest proportion of total food waste, followed by bakery products, meat (including fish and poultry) and dairy products.

There are differences in this ranking by sector. Bakery products account for the highest proportion within retail food waste whereas at the consumer stage (food service or in home) fruit and vegetables represent a greater proportion of tonnage.

The product category profile in manufacturing is different to that of other sectors. Significant quantities of food waste relate to rejected inputs to production, materials not intended for human consumption (inedible or unsuitable for production) as well as quality out-grades, depot returns and wastes associated with plant washing and cleaning. Fresh fruit and vegetables make a less significant contribution to food waste as more of the losses for these products occur 'upstream' of where produce is packed (i.e. on farm), rather than within the processing sector.

Figure 1 and Figure 2 present findings on the quantities of total and avoidable food waste in the EU 28 across four sectors. Two food product categories, fresh fruit and vegetables and bakery, account for over half of the avoidable food waste, taking retail, food service and household together (Figure 3).

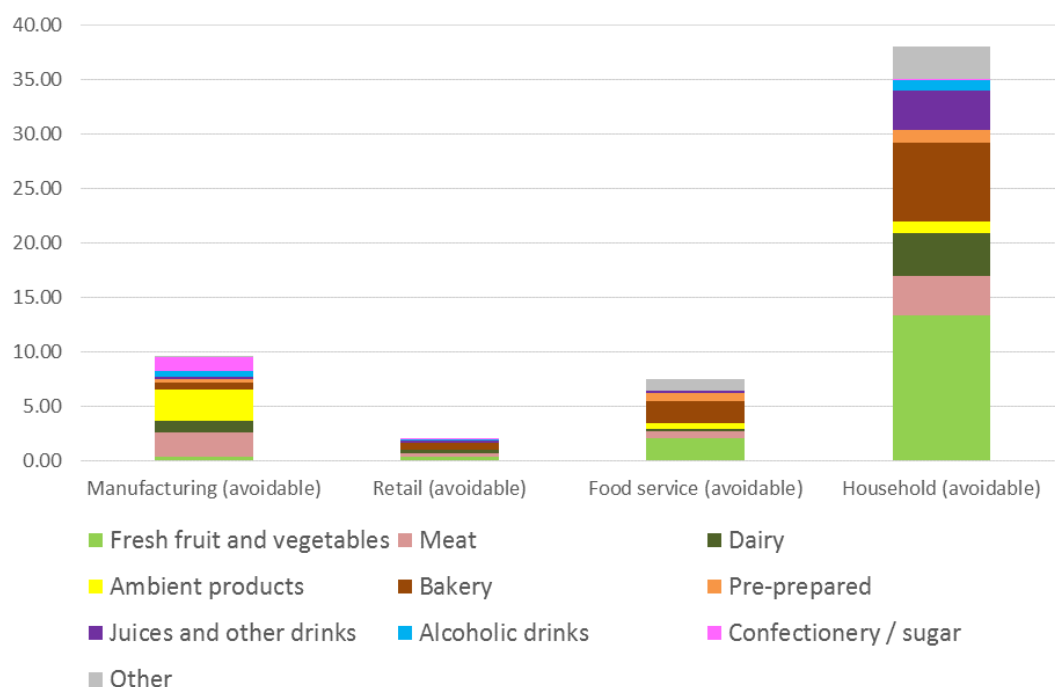
Figure 1. EU 28 total food waste by food product category, across 4 sectors (Mt/year)



Source: ICF/Anthesis based on European Commission (FP7), Coordination and Support Action (2016a, 2016b); FAO (2011, 2011c); WRAP (2013f, 2016, 2016a)

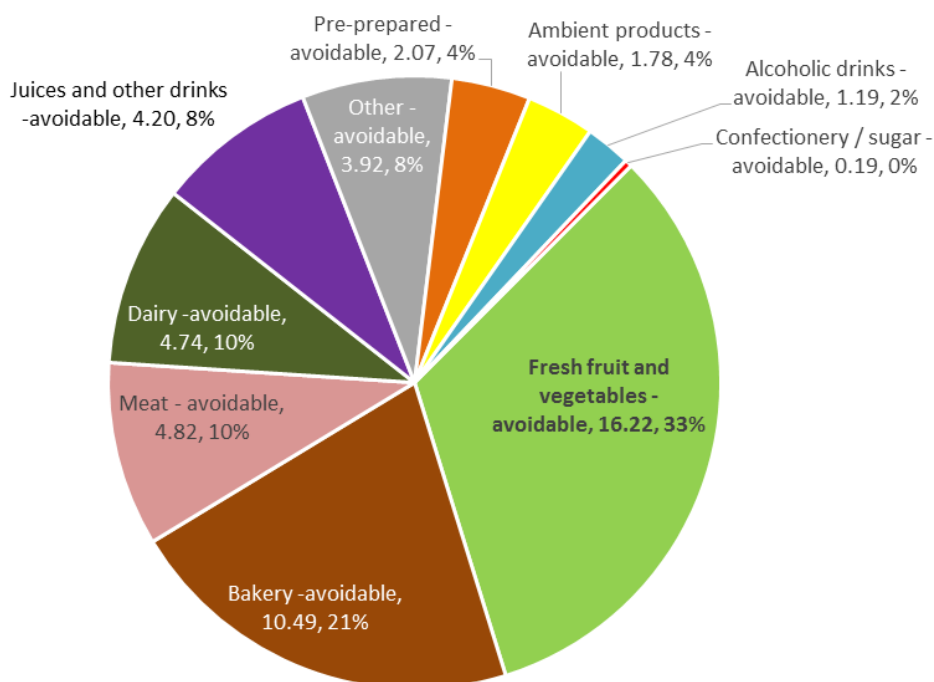
<sup>23</sup> European Commission (FP7), Coordination and Support Action, FUSIONS, 2016a

Figure 2. EU 28 avoidable food waste by food product category, across 4 sectors (Mt/year)



Source: ICF/Anthesis based on European Commission (FP7), Coordination and Support Action (2016a, 2016b); FAO (2011, 2011c); WRAP (2013f, 2016, 2016a)

Figure 3. Avoidable food waste profile for combined retail, food service and household sectors (Mt / year)



Source: ICF/Anthesis based on European Commission (FP7), Coordination and Support Action (2016a, 2016b); FAO (2011, 2011c); WRAP (2013f, 2016, 2016a)

The costs associated with food waste in the EU-28 were estimated by the FUSIONS project to be around €143 billion in 2012<sup>24</sup>. This estimate included food waste from food production, which is not within the scope of the current project.

The product category level data compiled for the four sectors by the current study permit a more detailed assessment of costs related to food waste. For the manufacturing stage, estimates have taken account two factors: the extent to which food waste was avoidable and the extent to which losses were ingredients, 'work in progress' or final product. These factors were derived for each product category, based on the WRAP 2016 study and the value of losses were estimated from sales of finished product reported within the PRODCOM datasets. For retail and food service sector, losses were assumed to be final product, with the lost sales value based on data collected by WRAP 2016a and WRAP 2013c. The estimated value of food waste for manufacture, retail, food service and household sectors was in the order of €200 to €250 billion, significantly higher than the FUSIONS estimates which were based on a single Euro/ tonne value of food waste applied to the EU-28 food waste total. Further research, outside the scope of this study, would be needed to refine these indicative estimates to take account of Member State differences in food costs and to establish for the manufacturing sector the extent to which food waste is in the form of final product, ingredient or waste generated during 'work in progress'.

## 2.6 The wasted food products most sensitive to date mark and labelling issues

There is only a limited amount of research evidence directly linking food waste with the use of date marks. The most relevant evidence relates to consumer food waste, with one source providing estimates of the significance of date expired products in food waste at manufacture, retail and household stages (WRAP, 2015). For the purposes of this study those estimates have been adapted based on the more detailed statistics collected over the course of the study. An EU-28 extrapolation is provided in Table 5. Annual EU-28 food waste attributable to date marking issues was estimated at between 6.9 Mt/yr and 8.9 Mt/yr across the manufacturing/ processing, retail and household sectors, with the upper value approximating to around 10% of the total food waste estimated by the FUSIONS project (88 Mt/yr).

Table 5. Estimates for the maximum amount of waste arising attributable to date marking issues

Sectors	As % of sectoral food waste	Total (Mt / year)
Manufacture (MLOR linked to depot returns)	5%	<1
Retail (Linked to "date expiry" in stores)	55%	2.5
Household (Consumers citing date labels in their discard decisions)	9.5% to 12%	4.4 to 5.5

Source: ICF, based on WRAP (2014b)

Table 6 draws together the quantitative data based on the product category estimates of food waste with the consumer evidence linking food product wastage to date marks.

<sup>24</sup> European Commission (FP7), Coordination and Support Action, FUSIONS, 2016a

Table 6. Summary of findings by product category

Food product category	Proportion of total food available for consumption (based on FAO, 2011)	Proportion of avoidable food waste in EU retail, food service and household sectors by product category (based on Figure 3)	Extent to which product packaged + date marked (WRAP, 2016a, unless otherwise specified)	Sensitivity to date mark issue at consumer stage(WRAP, 2015)
Fresh fruit and vegetables	20.4%	33%	<ul style="list-style-type: none"> <li>Prepared fruit/ veg require 'used by' date;</li> <li>Loose product does not require a "best before" date as covered by exemption</li> <li>95% of UK retail sector fresh fruit and vegetable food waste has a date label</li> <li>May not be typical of EU28</li> </ul>	<ul style="list-style-type: none"> <li>Varies by product, but evidence suggests that consumers are less responsive to date marks in this product area than others and are more likely to take visual cues from appearance and product condition. Not clear why so much of this category has "best before" dates applied in the UK as not a legal requirement e.g. potatoes may have 'no dates'.</li> </ul>
Bakery	14.7%	21%	<ul style="list-style-type: none"> <li>Fresh/ instore bakery products not date marked: limited shelf life so high wastage rates if demand predictions wrong;</li> <li>Standard packaged sliced loaves: lower wastage rate.</li> </ul>	<ul style="list-style-type: none"> <li>Packaged products may have 'display until' or "best before" dates; issue of whether or not home freezing advice included.</li> </ul>
Meat, fish, poultry	10.5%	10%	<ul style="list-style-type: none"> <li>Sold over the counter: no date mark; pre-packaged fresh / chilled product with "use by" dates</li> <li>Use of "best before" labels in some cases: by Swedish manufacturers for cold smoked salmon; by Danish and Swedish manufacturers for cooked and warm smoked ham (Norden, 2015)</li> </ul>	<ul style="list-style-type: none"> <li>Use by dates; consumers more sensitive to date labels on fresh/ processed meat, fish, poultry products.</li> </ul>
Dairy (incl. milk, cheese and eggs)	21.1%	10%	<ul style="list-style-type: none"> <li>Over the counter hard cheeses are not date marked; majority of products are pre-packed; possible variances on freezing advice</li> </ul>	<ul style="list-style-type: none"> <li>Consumers are more attentive to date marks in relation to dairy products (discard decisions rely more on 'date' than visual cues); however, different types of date</li> </ul>

Food product category	Proportion of total food available for consumption (based on FAO, 2011)	Proportion of avoidable food waste in EU retail, food service and household sectors by product category (based on Figure 3)	Extent to which product packaged + date marked (WRAP, 2016a, unless otherwise specified)	Sensitivity to date mark issue at consumer stage (WRAP, 2015)
				mark are applied, adding to confusion. Date mark / egg codes regime separately specified by regulations, including "best before" date.
Soft drinks/ juices	15.4%	8%	<ul style="list-style-type: none"> <li>Mix of product types: some with longer shelf life (e.g. carbonated drinks)</li> </ul>	<ul style="list-style-type: none"> <li>Fruit juice/ chilled fresh product may have a variety of different date marks. Consumer research shows sensitivity to date mark in consumer decision to dispose of unconsumed product.</li> </ul>
Pre-prepared meals	3.1%	4%	<ul style="list-style-type: none"> <li>Chilled product with "use by" dates; frozen with "best before"</li> </ul>	<ul style="list-style-type: none"> <li>Variations in home freezing advice in relation to date of purchase may be an issue with specific chilled products.</li> </ul>
Ambient products	6.8%	4%	<ul style="list-style-type: none"> <li>Packaged products carrying a "best before" date, with a long shelf life<sup>25</sup></li> </ul>	<ul style="list-style-type: none"> <li>Expiry of "best before" date <sup>26</sup> may not represent an actual decline in product quality</li> </ul>
Frozen products	N/A	N/A %	<ul style="list-style-type: none"> <li>Frozen products have "best before" dates: lower wastage rate than fresh/ chilled equivalents (however it is not possible to distinguish food temperature of storage in consumer food waste audits: therefore frozen product contribution to total food waste cannot be estimated separately)</li> </ul>	<ul style="list-style-type: none"> <li>Not much scope for different approaches to date marks with frozen produce</li> </ul>

Source: ICF

<sup>25</sup> 'shelf life' = the date on the product regardless of the label, such as 'use by' or 'best before'.

<sup>26</sup> As above.

## **3 Market research**

### **3.1 Introduction**

Market research was conducted to obtain empirical evidence of the date marking practices for a set of selected product types in Member States chosen to represent the diversity of food retail markets of the European Union. The main purpose was to identify differences and similarities in date marking practices for products that look, from a consumer perspective, quite similar. Other relevant information such as the length of shelf life available for consumers at time of purchase (i.e., at time of survey), and whether foods with shorter shelf life were made available at discount, was also documented.

The research was conducted using a 'mystery shopping' format in which pre-specified products were purchased from a target list of stores in eight Member States: Germany (DE), Greece (EL), Hungary (HU), the Netherlands (NL), Poland (PL), Slovakia (SK), Spain (ES) and Sweden (SE).

### **3.2 Method**

The market research methodology is set out in full in Annex 3. Target product types and fieldwork methodology are summarised in the subsections below.

#### **3.2.1 Selection and specification of food product types**

Food product types were selected on the basis of the desk research described in Section 2. They were:

- pre-prepared fruit/ vegetables;
- pre-packed sliced bread;
- chilled fish;
- sliced ham;
- fresh milk;
- yoghurts;
- hard cheese;
- fresh juice (chilled);
- pre-prepared chilled pasta; and
- sauce (ketchup).

The main factors in the selection of these product types are set out in detail in Table A3.1 of Annex 3<sup>27</sup>. In brief, they are the:

- food category's overall contribution to EU-28 avoidable food waste;
- evidence of use of different types of date mark for the same product type;
- extent to which consumers may take into account date marks when deciding whether or not to discard particular products;
- relevant issues identified for the products relating to open life guidance, storage for optimal product life, and home freezing advice.

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<sup>27</sup> The selection of product types also took into account the final selection of six products by the Horizons 2020 REFRESH project for use in consumer-facing date label and consumer storage advice research in June 2017, namely: yoghurt, carrots, oranges, fresh meat, fresh (pasteurised) juice, and bread. However, the REFRESH selection of products reflects a different project remit, with the research focusing on visual testing of clarified or enhanced date mark and storage information across the selected products.



Frozen products were not retained because date labelling issues are generally of lesser significance for these products, as explained in Section 2.6 (Table 6).

Detailed product specifications were defined for each of the 10 product types (Table 7). These enabled valid comparisons in date-marking and information practices to be made between products (of the same type) across different brands, retailers, and Member States<sup>28</sup>. Despite being set tightly, the product specifications allowed fieldworkers (the “mystery shoppers”) to purchase substitute products if the target products were unavailable.

### **3.2.2 Sampling strategy**

The main objective was to maximise the diversity of date marking and other information on food labels. To achieve this, it was necessary to maximise the diversity of items purchased within the 10 defined product types. To maximise the diversity of items purchased, care was taken to prioritise larger retailer organisations (“retailers”) and larger store formats and to visit one store of each selected retailer only once. The strategy is described in detail in Section 3.2 of Annex 3.

Retailers were selected on the basis that selecting them would:

- increase the likelihood of fieldworkers obtaining the target food products (or suitable substitutes) at store visits;
- enable the widest possible selection of products to be obtained at each retail store visit; and
- account for different shopper demographics and retailer market positioning.

The sampling strategy was designed to:

- balance discounters and conventional stores;
- take account of overall market shares; and, where possible,
- include a mix of endemic and multinational retailers.

In total, the market research involved 34 visits to discounters and 75 visits to conventional retailers (supermarkets and hypermarkets). Table 8 indicates the number of visits to discounters and the number of visits to conventional retailers conducted in each Member State.

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<sup>28</sup> Use of less-detailed specifications might have led to products being purchased that are subject to different date-marking practices because of differences in product characteristics such as composition, preparation, size, or in-store storage conditions.)

Table 7. Description and exclusion criteria for each of the food products to be purchased during the mystery shopping

Product type	Product description	Item size	Storage	Examples of exclusions	Acceptable substitutions
Pre-prepared fruit/vegetables	<b>Pre-packed green salad/ pre-cut lettuce leaves</b>	90g – 120g	Chilled	Whole lettuce heads. Organic lettuce. Baby lettuce. Lettuce hearts. Rocket, spinach, chard, watercress, radicchio, lambs' lettuce. Salad with grated beetroot or carrot, tomatoes, or croutons.	Mixed green leaf salad (mixture of lettuce and other leaf types). Bag larger than 120g, e.g., 150g.
Pre-packed sliced bread	<b>White, medium sliced bread</b>	800g	Ambient	Seeded, granary, brown, 50/50, "best of both", unsliced, organic, "free-from", "stay fresh", or "toastie". Non-wheat bread. Unsliced. Small packs of same composition. In-store bakery or loose.	Thin-sliced or thick-sliced white. White, sliced "toast" bread is acceptable if standard white, sliced bread is not available.
Chilled fish	<b>Pre-packed smoked salmon</b>	100 – 120g	Chilled	Deli counter, loose, pre-cooked, flavoured, coated, frozen, mixed pack, chopped.	Pack larger than 120g, e.g., 150g. Smoked mackerel (a 2-piece pack)
Sliced ham	<b>Pre-packed sliced prosciutto / serrano dry-cured ham'</b>	125g	Chilled	Honey roast, breaded, smoked or wafer thin ham. Ham from in-store delicatessen.	Sliced pre-packed cured beef
Fresh milk	<b>Semi-skimmed cows' milk</b>	1 litre	Chilled	Skimmed, organic, lactose-free, UHT, long-life, flavoured, ultra-filtered. Goats' or ewes' milk. Plant milk (e.g., almond, coconut or soya)	Whole (i.e., full fat) cows' milk
Yoghurts	<b>Strawberry yoghurts in a multipack</b>	4 pack	Chilled	Organic, lactose-free, or low-fat yoghurts. Yoghurt drinks, Muller corners. Active/ live/ bio-yoghurts or single pots (unless no others available).	4 pack of summer berries, red fruits, 2 strawberry & 2 raspberry.

Product type	Product description	Item size	Storage	Examples of exclusions	Acceptable substitutions
Hard cheese	<b>Sliced cheddar</b>	240 – 250g	Chilled	Light/ reduced fat, extra-mature, medium, or smoked cheddar. Organic. Lactose-free. Grated, unsliced, loose, or in individual portions. Niche products. Cheese from in store delicatessen. Soft cheese. Goats' or ewes' milk cheese.	Sliced emmental or gouda. (Ideally, the same strength sliced hard cheese should be purchased in all store visits. If mild unavailable, medium is acceptable.)
Fresh juice	<b>Smooth fresh orange juice</b>	1000ml	Chilled	Freshly squeezed. Organic. Mixed fruit flavour. 'Juice drink'. Multipacks or single portion bottles.	Fresh orange juice with bits, smooth fresh apple juice
Pre-prepared chilled pasta	<b>Pasta with a vegetable filling</b>	400g	Chilled	Non-vegetable filling. Pasta stored at ambient temperature. Cannelloni & lasagne. Lunch pots.	Pack larger than 400g. Fresh pasta with a mushroom filling.
Sauce (ketchup)	<b>Tomato ketchup ('squeezy' bottle)</b>	460-580g	Ambient	Other table sauces, e.g., barbeque sauce, or relishes, e.g., salsa. Organic. Low sugar or salt.	Tomato ketchup in glass bottle

Source: ICF.

Table 8. Number of visits to discounters and conventional retailers conducted in each Member State by mystery shoppers

Member State	Supermarkets and hypermarkets	Discounters
	Number of visits	Number of visits
<b>Germany</b>	11	7
<b>Greece</b>	9	3
<b>Hungary</b>	8	4
<b>Netherlands</b>	8	4
<b>Poland</b>	11	5
<b>Slovakia</b>	10	2
<b>Spain</b>	10	5
<b>Sweden</b>	8	4
<b>TOTAL</b>	<b>75</b>	<b>34</b>

Source: ICF

### 3.2.3 Data gathering and quality assurance checks

Fieldworkers purchased single items of each brand (company brand or retailer's own brand<sup>29</sup>) found during each store visit, working to the pre-defined product specification. After each store visit, they recorded, via an online questionnaire:

- contextual data about the store (such as date and time of visit, store format, any promotions applied to the selected products) and
- information about each product (such as location of date labels of the packaging, the date, and the exact wording used).

A full specification of the information recorded is provided in Section 3.2.4 of Annex 3. Table A3.6 of Annex 3 provides a fictional example of data gathered during a store visit for illustration.

Fieldworkers provided photographs of each product. These showed the front of the pack, date label information, (including any supplementary advice), the ingredients list and barcode. In the case of food products that had both food contact packaging and outer packaging (such as cardboard sleeves), the photographs covered both packaging elements. The photos included any date marks appearing on the products as well as other relevant open-life instructions and on-pack storage advice, such as home freezing advice, "once opened, eat within x day" and home storage instructions.

The study team reviewed each fieldworker's data entries and corresponding photographs and then gave feedback on any errors. This feedback resulted in correction of errors or in amendment to products purchased in subsequent store visits.

<sup>29</sup> A "company brand" is a brand owned by a food manufacturer; a "retailer's own brand" is owned by a food retailer

### 3.3 Market research results and analysis

#### 3.3.1 Products sampled by product type and Member State

Over the course of **109 store visits** in eight Member States, **2,296 products** within the scope of specifications set out in Table 7 were purchased. Table 9 gives a breakdown of these products by product category and Member State. In total, **1,058 brands** were sampled. Table 10 gives a breakdown of these brands by product category and Member State.

Of the items purchased, **71% were target products** according to the specifications set out in Table 7, and **29% were acceptable substitute products**. Table 11 gives a breakdown by product category.

The high proportion of substitute cheeses (85%) is due to a widespread lack of availability of cheddar cheese (though there was a good availability of substitute pre-sliced hard cheeses such as Edam, Gouda, Herregård and Emmental). The high proportion of substitute yoghurts (75%) is due to a widespread lack of availability of the 4-pack format (strawberry flavoured yoghurts are commonly available in other packaging formats).

The availability of four-pack strawberry yoghurts varied by country (Table A4.1 in Annex 4). The most common substitute product was the single-pot strawberry yoghurt. Other substitutions were strawberry yoghurts in other types of multi-pack (2-pack, 3-pack or 6-pack) or yoghurts of other flavours (in single pots or various types of multi-pack).

Semi-skimmed fresh milk was widely available, except in Germany and Greece. In Germany, full-fat milk or low-fat<sup>30</sup> milk were bought as substitutes. In Greece, the only substitute purchased was low-fat milk (Table A4.2 in Annex 4).

Bread purchases had to accommodate the differences in bread culture across the eight countries (Table A4.3 in Annex 4). In Greece, Hungary, Poland and (to a lesser extent) Sweden and Germany, the pre-packaged bread products mainly available were those specifically marketed for toast/sandwich making.

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<sup>30</sup> Low fat milk in this case means with a fat content typically around 1.8%, i.e., lower than that of semi-skimmed milk (2.5%) but greater than that of skimmed milk (0.1%).

Table 9. Products sampled by product type and Member State

Member State	Product Type										
	Chilled fish	Fresh juice	Fresh milk	Hard cheese	Pre-packed sliced bread	Pre-prepared chilled pasta	Pre-prepared fruit/vegetables	Sauce	Sliced ham	Yoghurt	ALL
DE	34	39	31	43	35	32	26	26	40	45	351
EL	18	59	55	28	53	4	18	22	18	17	292
HU	16	51	49	33	21	11	8	33	23	33	278
NL	16	19	26	28	11	10	12	29	17	11	179
PL	39	50	56	64	57	13	22	85	30	44	460
SK	15	27	21	32	20	8	13	33	22	38	229
ES	31	21	17	22	27	28	22	32	58	23	281
SE	18	20	22	31	24	22	15	26	30	18	226
<b>TOTAL</b>	<b>187</b>	<b>286</b>	<b>277</b>	<b>281</b>	<b>248</b>	<b>128</b>	<b>136</b>	<b>286</b>	<b>238</b>	<b>229</b>	<b>2,296</b>

Source: ICF

Table 10. Brands sampled by product type and Member State

Member State	Product Type										
	Chilled fish	Fresh juice	Fresh milk	Hard cheese	Pre-packed sliced bread	Pre-prepared chilled pasta	Pre-prepared fruit/vegetables	Sauce	Sliced ham	Yoghurts	ALL
DE	18	24	28	27	18	17	17	15	33	19	216
EL	15	24	26	12	15	4	9	15	14	6	140
HU	9	17	29	15	10	6	5	20	14	11	136
NL	9	12	15	18	11	8	12	12	16	3	116
PL	23	18	25	35	34	12	12	31	21	16	227
SK	11	15	13	18	14	6	11	16	16	16	136
ES	17	15	9	19	14	18	15	18	36	12	173
SE	11	9	11	20	7	11	9	10	22	3	113
SUM	113	134	156	164	123	82	90	137	172	86	1,257
<b>TOTAL</b> (excluding duplications)	<b>98</b>	<b>110</b>	<b>142</b>	<b>142</b>	<b>110</b>	<b>59</b>	<b>84</b>	<b>105</b>	<b>144</b>	<b>64</b>	<b>1,058</b>

Source: ICF

Table 11. Numbers and proportions of target products and substitute products for each product type

	Product Type										
	Chilled fish	Fresh juice	Fresh milk	Hard cheese	Pre-packed sliced bread	Pre-prepared chilled pasta	Pre-prepared fruit/vegetables	Sauce	Sliced ham	Yoghurts	ALL
Target product (no.)	<b>184</b>	<b>268</b>	<b>207</b>	41	<b>157</b>	<b>92</b>	<b>114</b>	<b>274</b>	<b>238</b>	57	<b>1,632</b>
Target product (%)	<b>98%</b>	<b>94%</b>	<b>75%</b>	15%	<b>63%</b>	<b>72%</b>	<b>84%</b>	<b>96%</b>	<b>100%</b>	25%	<b>71%</b>
Substitute product (no.)	3	18	70	<b>240</b>	91	36	22	12	0	<b>172</b>	664
Substitute product (%)	2%	6%	25%	<b>86%</b>	37%	28%	16%	4%	0%	<b>75%</b>	29%
All products (no.)	<b>187</b>	<b>286</b>	<b>277</b>	<b>281</b>	<b>248</b>	<b>128</b>	<b>136</b>	<b>286</b>	<b>238</b>	<b>229</b>	<b>2,296</b>

Source: ICF



### 3.3.2 Retailers' own-brands and company brands

Of the 1,058 brands sampled, 328 were "retailers' own brands" and 730 were "company brands" – a ratio of 31%:69%. Table 12 shows this ratio in terms of numbers sampled and percentages for each of the 10 product types sampled.

Yoghurt, chilled fish, and hard cheese each have a ratio of retailers' own brands to company brands very similar to the average (31%:69%). The product type with the largest representation of retailers' own brands was pre-prepared fruit/ vegetables (38%:62%), the product with the largest representation of company brands was sliced ham (24%:76%).

Table 12. Brand breakdown by product type: retailers own brands, company brands, total

Product type	Retailers' own-brands	Company brands	Total
Chilled fish (number and %)	29	69	98
	30%	70%	100%
Fresh juice (number and %)	39	71	110
	35%	65%	100%
Fresh milk (number and %)	37	105	142
	26%	74%	100%
Hard cheese (number and %)	41	101	142
	29%	71%	100%
Pre-packaged sliced bread (number and %)	40	70	110
	36%	64%	100%
Pre-prepared chilled pasta (number and %)	21	38	59
	36%	64%	100%
Pre-prepared fruit/ vegetables (number and %)	32	52	84
	38%	62%	100%
Sauce (number and %)	35	70	105
	33%	67%	100%
Sliced ham (number and %)	34	110	144
	24%	76%	100%
Yoghurts (number and %)	20	44	64
	31%	69%	100%
Total (number and %)	<b>328</b>	<b>730</b>	<b>1,058</b>
	<b>31%</b>	<b>69%</b>	<b>100%</b>

Source: ICF

Of the products purchased, 24% displayed a retailer's own brand and 76% displayed a company brand (see Table 13). The proportion of products purchased from discounters that were retailers' own-brand products (38%) is almost twice as high as the proportion of products purchased from conventional grocery retailers that were retailers' own-brand products (21%).

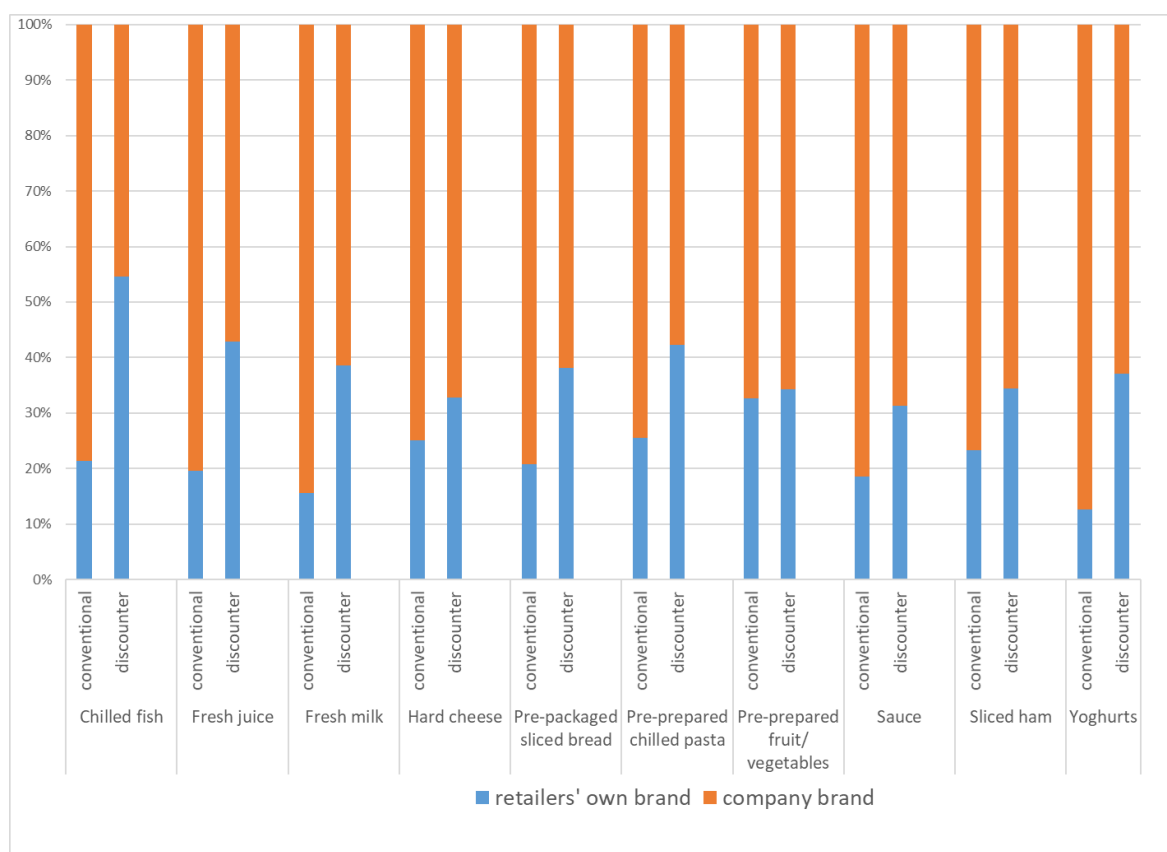
Table 13. Breakdown of "retailers' own brand" products and "company brand" product totals by retailer type

Retailer type	"Retailers' own brand" products sampled	"Company brand" products sampled	Total
Conventional retailers (number and %)	370 21%	1,420 79%	1,790 100%
Discounters (number and %)	191 38%	315 62%	506 100%
<b>Total (number and %)</b>	<b>561</b> <b>24%</b>	<b>1,735</b> <b>76%</b>	<b>2,296</b> <b>100%</b>

Source: ICF

For each of the 10 product types, Figure 4 shows the ratio of "retailers' own brand" products to "company brand" products at conventional retailers and the ratio of "retailers' own brand" products to "company brand" products at discounters. These two ratios are most similar to each other for pre-prepared fruit/ vegetables and most different from each other for chilled fish.

Figure 4. Ratio of "retailers' own brand" products and "company brand" for each of the 10 product types at conventional retailers and at discounters



Source: ICF

### 3.3.3 Findings on date marks and date wording

The FIC Regulation<sup>31</sup> requires that food labelling must<sup>32</sup> display one of the following two types of date<sup>33</sup>:

- a “best before” date: the date until which the labelled food retains its specific properties when properly stored, also known as the “date of minimum durability”<sup>34</sup>; or
- a “use by” date: the deadline for consumption of the labelled food, after which it will be deemed unsafe for human consumption even when properly stored throughout the preceding period.

Annex X of the FIC Regulation specifies the exact wording that should be used to identify the marked date as either a “best before” date or a “use by” date<sup>35</sup>. Table 14 provides the “date wording” specified by the FIC Regulation in the languages of the Member States in which market research was undertaken.

Annex X also defines the format for “best before” dates and “use by” date marks. Both kinds of date mark must consist of “the day, the month and, possibly, the year in that order and in uncoded form.” However, the FIC Regulation provides flexibility in how a “best before” date is indicated depending on the length of the product's shelf life<sup>36</sup>.

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<sup>31</sup> 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. Available [here](#). (Last accessed 19 December 2017.)

<sup>32</sup> Annex X, point 1(d) of the FIC Regulation provides a list of foods that are not required to bear a Best Before date. This list does not include any product types purchased during the market research phase of this study.

<sup>33</sup> FIC Regulation, Article 9(1)(f):

“1. [In accordance with Articles 10 to 35 and subject to the exceptions contained in this Chapter,] indication of the following particulars shall be mandatory: ...

... (f) the date of minimum durability or the ‘use by’ date”

<sup>34</sup> Regulation (EU) No 1169/2011, Article 2(2)(f): “date of minimum durability of a food’ means the date until which the food retains its specific properties when properly stored”

<sup>35</sup> Annex X, point 1(a) for the “best before” date:

“1. The date of minimum durability shall be indicated as follows:

(a) the date shall be preceded by the words:  
- ‘Best before...’ when the date includes an indication of the day,  
- ‘Best before end...’ in other cases,”

Annex X, point 2(a) for the “use by” date:

“2. The ‘use by’ date shall be indicated as follows:

(a) the date shall be preceded by the words ‘use by’;”

<sup>36</sup> Annex X, point 1(c) for the “best before” date:

“1. The date of minimum durability shall be indicated as follows:...

(c) the date shall consist of the day, the month and, possibly, the year, in that order and in uncoded form.

However, in the case of foods:

- which will not keep for more than 3 months, an indication of the day and the month shall be sufficient,
- which will not keep for more than 3 months but not more than 18 months, an indication of the month and the year shall be sufficient,
- which will keep for more than 18 months, an indication of the year shall be sufficient”

Annex X, point 2(a) for the “use by” date:

“2. The ‘use by’ date shall be indicated as follows:...

(c) the date shall consist of the day, the month and, possibly, the year, in that order and in uncoded form.”

With regard to the presence, wording and format of date marks, the research found that (Table 15):

- There was a high level of compliance with the terms of the FIC Regulation:
  - The great majority of products sampled (2,196, 95.6% of total) displayed a “best before” or “use by” date mark with wording that is in line with the relevant requirement of the FIC Regulation;
  - All date marks displayed were in one of the appropriate formats (e.g., day and month, or month and year).
- A small minority of products showed some form of non-compliance:
  - 100 individual products (4.4% of products sampled) did not display date wording that is in line with the relevant requirement of the FIC Regulation. Of these:
    - 43 products (1.9%) displayed no date wording (though a date was provided, see commentary in the following section);
    - 39 products (1.7%) displayed date wording whose meaning could not be determined with certainty (although in some cases, it appeared similar to “best before” or “use by” wording in the relevant language);
    - 15 products (0.7%) displayed forms of date wording that identified the date marks as neither “best before” nor “use by” (for example, packing dates, delivery dates, “display until” dates, “sell by” dates, and – for a chilled fish product – a date of catch);
    - 2 products (0.1%) display date wording only in a language other than that of the Member State in which the products were purchased; and
    - 1 product (<0.1%) displays both a “best before” date mark and a “use by” date mark.
- Non-compliances were concentrated in a small number of product types:
  - 25 pre-prepared fruit /vegetable products (18.4% of total) did not display date mark and wording consistent with the provisions of the FIC Regulation. For 14 cases, the date mark was absent; for the remaining 11 cases, the date wording was absent or not consistent with the provisions of the FIC Regulation;
  - 19 pre-packed sliced-bread products (7.7% of total) did not display date wording consistent with the provisions of the FIC Regulation. The two main reasons for this were: (i) the display of date wording whose meaning could not be determined with certainty; and (ii) to the date wording indicating a “sell by” date or date of packing.
  - 10 chilled fish products (5.3% of total) did not display date wording consistent with the provisions of the FIC Regulation. In most cases, this was because the meaning of the date wording could not be determined with certainty.
  - For all other product types, the incidence of products purchased failing to display date wording consistent with the FIC Regulation was less than the average incidence across all product types (i.e. less than 4.4%).
- For some product types the packaging usually displayed “best before” dates while for other product types the packaging usually displayed “use by” date marks (Table 16):
  - “best before” date marks predominated for: sauce (98.6% of products sampled); pre-packed sliced bread (86.3%); fresh juice (85.3%); hard

cheese (81.9%); sliced ham (73.1%); and pre-prepared chilled pasta (53.9%).

- "use by" date marks predominated for: chilled fish (75.4% of products sampled); pre-prepared fruit/ vegetables (70.6%); fresh milk (68.1%); and yoghurts (64.3%).

Table 16 shows, for each product type, the Member States in which a "best before" date mark was more popular and those in which a "use by" date mark was more popular. Figure 5 shows the variation in usage of "best before" and "use by" date marks by product type and Member State in graphic form.

Table 17 provides examples found of date wording that could not be determined with certainty to be either "best before" or "use by". Table A5.1 of Annex 5 shows examples of the precise date wording found on products, some of which is consistent with the FIC Regulation, and some which is not.

Table 14. Date wording specified by Regulation (EU) No 1169/2011, Annex X, points 1(a) and 2(a)

Member State	Minimum durability ("best before") date wording...		"use by" date wording
	...when the date mark indicates the day, i.e., "best before"	...when the date mark includes only the month & year, i.e., "best before end..."	
Germany	Mindestens haltbar bis...	Mindestens haltbar bis Ende...	Zu verbrauchen bis...
Greece	Ανάλωση κατά προτίμηση πριν από...	Ανάλωση κατά προτίμηση πριν από το τέλος...	Ανάλωση έως...
Hungary	Minőségét megőrzi...	Minőségét megőrzi ... végéig	Fogyasztható...
Netherlands	Ten minste houdbaar tot...	"Ten minste houdbaar tot einde..."	Te gebruiken tot...
Poland	Najlepiej spożyć przed...	Najlepiej spożyć przed końcem...	Należy spożyć do...
Slovakia	Minimálna trvanlivosť do...	Minimálna trvanlivosť do konca...	Spotrebujte do...
Spain	Consumir preferentemente antes del...	Consumir preferentemente antes del fin de...	Fecha de caducidad...
Sweden	Bäst-före...	Bäst före utgången av...	Sista förbrukningsdag...

Source: Regulation (EU) No 1169/2011.

Table 15. Number of purchased products by date type for all product types

Date Type	Product type										
	Chilled fish	Fresh juice	Fresh milk	Hard cheese	Pre-packed sliced bread	Pre-prepared chilled pasta	Pre-prepared fruit/veg.	Sauce	Sliced ham	Yoghurt	ALL
Best Before (no. and as % of all products)	36 19.3%	<b>244</b> <b>85.3%</b>	90 32.5%	<b>230</b> <b>81.9%</b>	<b>214</b> <b>86.3%</b>	<b>69</b> <b>53.9%</b>	15 11.0%	<b>282</b> <b>98.6%</b>	<b>174</b> <b>73.1%</b>	73 31.9%	<b>1,427</b> <b>62.2%</b>
Use By (no. and as % of all products)	<b>141</b> <b>75.4%</b>	32 11.2%	<b>178</b> <b>64.3%</b>	39 13.9%	15 6.0%	54 42.2%	<b>96</b> <b>70.6%</b>	0 0.0%	58 24.4%	<b>156</b> <b>68.1%</b>	<b>769</b> <b>33.5%</b>
Sub-total in line with FIC Regulation provisions (no., % of all products)	177 94.7%	276 96.5%	268 96.8%	269 95.7%	229 92.3%	123 96.1%	111 81.6%	282 98.6%	232 97.5%	229 100.0%	<b>2,196</b> <b>95.6%</b>
Sell by date/ date of sale	0	0	0	0	<b>7</b>	0	0	0	0	0	<b>7</b>
Date of packing	0	0	0	0	2	0	3	0	0	0	<b>5</b>
Delivery date	0	0	0	0	0	0	1	0	0	0	<b>1</b>
Use By & Best Before	1	0	0	0	0	0	0	0	0	0	<b>1</b>
Display until	0	0	0	0	0	0	1	0	0	0	<b>1</b>
Date of capture (fish)	1	0	0	0	0	0	0	0	0	0	<b>1</b>
Wording in wrong language for country	0	0	0	0	0	1	0	0	1	0	<b>2</b>
Uncertain date type	<b>7</b>	2	7	9	<b>9</b>	1	0	0	4	0	<b>39</b>
No date displayed	0	0	0	0	0	0	<b>14</b>	0	0	0	<b>14</b>
Date displayed but no wording displayed	1	8	2	3	1	3	6	4	1	0	<b>29</b>
Sub-total not in line with FIC provisions (no, %)	<b>10</b> <b>5.3%</b>	10 3.5%	9 3.2%	12 4.3%	<b>19</b> <b>7.7%</b>	5 3.9%	<b>25</b> <b>18.4%</b>	4 1.4%	6 2.5%	0 0.0%	<b>100</b> <b>4.4%</b>
<b>Total products</b>	<b>187</b>	<b>286</b>	<b>277</b>	<b>281</b>	<b>248</b>	<b>128</b>	<b>136</b>	<b>286</b>	<b>238</b>	<b>229</b>	<b>2,296</b>

Source: ICF. Note: Emboldened numbers relate to points highlighted in the accompanying text.

Table 16. Number of purchased products that display a "best before" date mark or a "use by" date mark for all product types

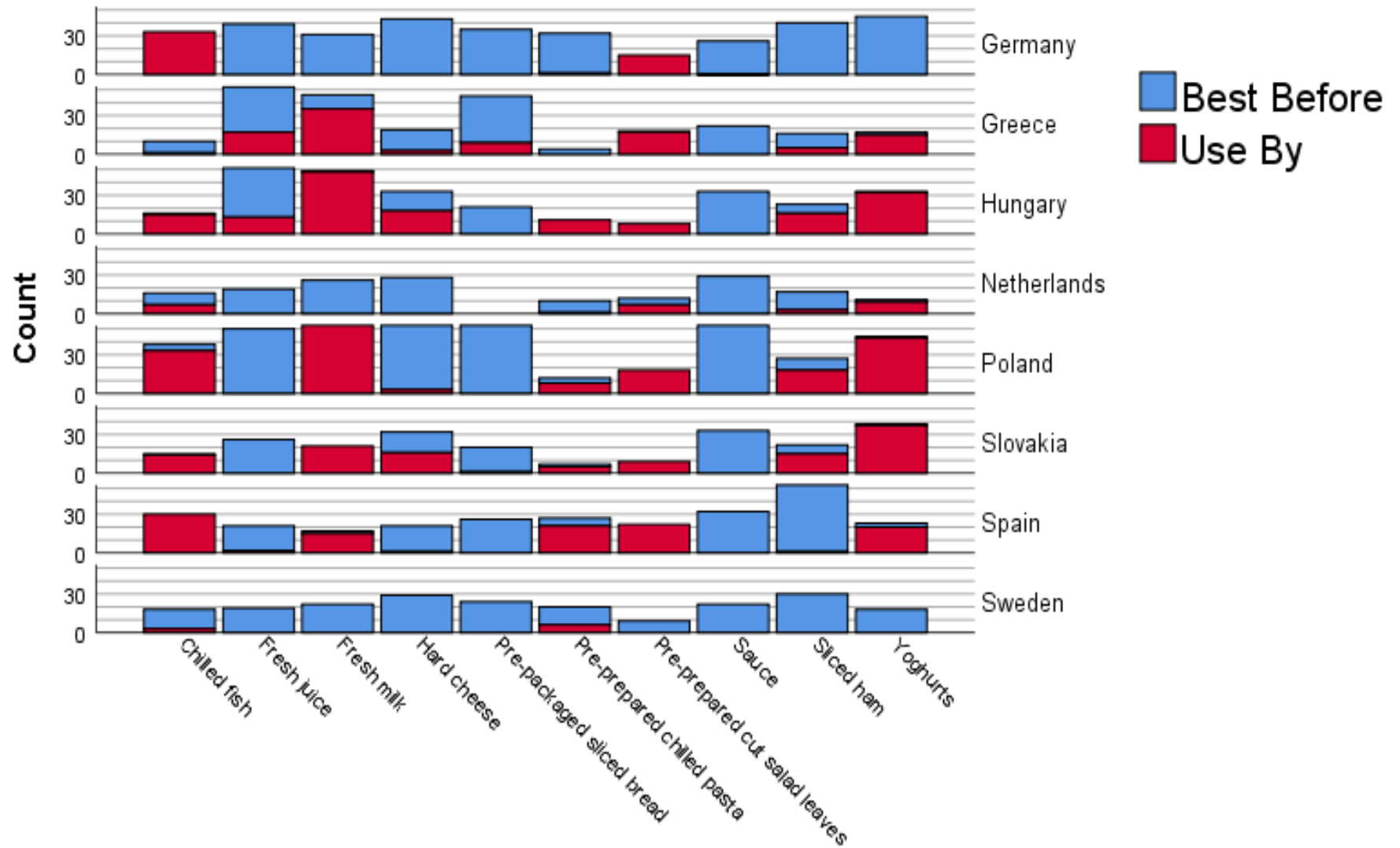
Date type	Product type										
	Chilled fish	Fresh juice	Fresh milk	Hard cheese	Pre-packed sliced bread	Pre-prepared chilled pasta	Pre-prepared fruit/ veg.	Sauce	Sliced ham	Yoghurt	ALL
"best before" (no. and as %*)	36	<b>244</b>	90	<b>230</b>	<b>214</b>	<b>69</b>	15	<b>282</b>	<b>174</b>	73	<b>1,427</b>
	20.3%	<b>88.4%</b>	33.6%	<b>85.5%</b>	<b>93.4%</b>	<b>56.1%</b>	13.5%	<b>100.0%</b>	<b>75.0%</b>	31.9%	65.0%
"use by" (no. and as %*)	<b>141</b>	32	<b>178</b>	39	15	54	<b>96</b>	0	58	<b>156</b>	<b>769</b>
	<b>79.7%</b>	11.6%	<b>66.4%</b>	14.5%	6.6%	43.9%	<b>86.5%</b>	0.0%	25.0%	<b>68.1%</b>	35.0%
Sum	177	276	268	269	229	123	111	282	232	229	<b>2,196</b>
Countries where "best before" is predominantly applied to product type	EL, SE	All	DE, NL, SE	DE, EL, NL, PL, ES, SE	DE, HU, PL, SK, ES, SE	DE, NL, SE, EL	SE	All	DE, EL, NL, ES, SE	DE, SE	
Countries where "use by" is predominantly applied to product type	DE, HU, PL, SK, ES	None	EL, HU, PL, SK, ES	HU	None	ES, SK, HU, PL	DE, EL, HU, PL, SK, ES	None	HU, PL, SK	EL, HU, NL, PL, SK, ES	

\* As a percentage of products purchased that have a date mark that is in line with the FIC Regulation provisions, whether Best Before or Use By

Source: ICF



Figure 5. Variation in usage of "best before" and "use by" date marks between product types and Member States



Source: ICF

Table 17. Examples of date wording found that could not clearly be determined as either "best before" or "use by"

Member State	Date wording in local language	English translation	Product types on which this date wording was found
Slovakia	Vychutnávajte si ma do	<i>Enjoy me in</i>	Fresh juice
Poland	Przydatności do spożycia	<i>[This is a term which is sometimes used as 'suitable for consumption until' as well as "best before"]</i>	Sliced ham
Greece	Ημερομηνία λήξης	<i>Expiry date</i>	Chilled fish, hard cheese, sliced ham
Spain	Caducidad	<i>Expiration</i>	Sliced ham

Source: ICF

### **3.3.4 Location of date wording in relation to date mark**

Annex X of the FIC Regulation allows the date wording to be placed alongside the date mark or to be apart from it, provided that the date wording is accompanied by a reference to where the date is given on the product labelling<sup>37</sup>.

The analysis of the location of the date wording and indication of the location of the date mark on the purchased products determined that:

- the location of date mark in relation to the date wording varied by packaging format. The data suggest that:
  - product types that are generally sold in relatively flat packaging, such as sealed trays, tend to display the date mark and date wording alongside each other (pre-prepared chilled pasta is an exception to this).
  - product types sold in other types of packaging (such as pots, bottles, and cartons) tend to display the date mark and date wording apart from each other.
- this pattern reflects physical constraints: locating the date wording alongside the date mark is more difficult to achieve with certain packaging formats than with others
- date marks and date wording generally appeared alongside each other on packaging for:
  - hard cheese (85.4% of products sampled);
  - chilled fish (78.1%);
  - pre-prepared fruit/ vegetables (70.6%); and
  - sliced ham (68.9%).
- date marks and date wording generally appeared in different locations of the packaging for:
  - yoghurts (72.1% of products sampled);
  - sauce (69.9%);
  - pre-packed sliced bread (66.5%);
  - fresh milk (66.1%);
  - pre-prepared chilled pasta (59.4%); and
  - fresh juice (54.2%).

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<sup>37</sup> FIC Regulation, Annex X, point 1(b) for “best before”:

“1.The date of minimum durability shall be indicated as follows:...

(a) the words in point (a) shall be accompanied by:

- ‘either the date itself, or,
- a reference to where the date is given on the labelling

FIC Regulation, Annex X, point 2(b) for “use by”:

“2.The ‘use by’ date shall be indicated as follows:...

(b) the words in point (a) shall be accompanied by:

- ‘either the date itself, or,
- a reference to where the date is given on the labelling

The review also found that:

- bottles, whether plastic or glass, generally displayed date marks on the bottle tops on the filling line and date wording on the label on the side of the bottle.
- cartons were more likely than bottles to show the date mark and date wording adjacent to each other. The majority of cartons of fresh juice displayed date mark and date wording together, whereas the majority of cartons of fresh milk displayed date mark and date wording apart from each other.
- most single pot yoghurts displayed date mark and date wording apart from each other (with the date mark being printed onto the metallised plastic covering lids and the date wording appearing on the label on the side of the pot). By contrast, a majority of the 4-pack yoghurts displayed date mark and date wording together, generally on the film lid of each pot.

Data describing the position of the date type and date wording relative to each other in the products that were purchased are provided in:

- Table 18 for all product types;
- Table 19 for yoghurt;
- Table 20 for each packaging format of fresh juice;
- Table 21 for each packaging format of fresh milk.

Annex 6 provides photographic examples of the most common arrangements of date mark and date wording for each product type in each typical form of packaging.

Table 18. Count of number of purchased products against relative position of date mark and date wording for all product types

Relative position of date mark and date wording	Product type										
	Chilled fish	Fresh juice	Fresh milk	Hard cheese	Pre-packed sliced bread	Pre-prepared chilled pasta	Pre-prepared fruit/vegetables	Sauce	Sliced ham	Yoghurt	ALL
Date and wording together (number and %)	<b>146</b> <b>78.1%</b>	123 43.0%	90 32.5%	<b>240</b> <b>85.4%</b>	82 33.1%	48 37.5%	<b>96</b> <b>70.6%</b>	80 28.0%	<b>164</b> <b>68.9%</b>	64 27.9%	1133 49.3%
In different locations (number and %)	32 17.1%	<b>155</b> <b>54.2%</b>	<b>183</b> <b>66.1%</b>	38 13.5%	<b>165</b> <b>66.5%</b>	<b>76</b> <b>59.4%</b>	20 14.7%	<b>200</b> <b>69.9%</b>	71 29.8%	<b>165</b> <b>72.1%</b>	1105 48.1%
Adjacent, but wording mixed with other text (number and %)	8 4.3%	0 0.0%	2 0.7%	0 0.0%	0 0.0%	1 0.8%	0 0.0%	2 0.7%	2 0.8%	0 0.0%	15 0.7%
No wording (number and %)	1 0.5%	8 2.8%	2 0.7%	3 1.1%	1 0.4%	3 2.3%	<b>20</b> <b>14.7%</b>	4 1.4%	1 0.4%	0 0.4%	43 1.9%
Total products	187	286	277	281	248	128	136	286	238	229	2296

Source: ICF

Table 19. Relative location of date mark and date wording for yoghurts

Number of yoghurt pots in product	Date and wording together	In different locations	Total
Single pot	4	<b>128</b>	132
	3.0%	<b>97.0%</b>	57.6%
2-pack	2	4	6
	33.3%	66.7%	2.6%
3-pack	14	0	14
	100.0%	0%	6.1%
4-pack	<b>41</b>	33	74
	<b>55.4%</b>	44.6%	32.3%
6-pack	3	0	3
	100.0%	0%	1.3%
<b>Total</b>	64	<b>165</b>	229
	27.9%	<b>72.1%</b>	100.0%

Source: ICF

Table 20. Relative location of date mark and date wording for fruit juice

Packaging format	Date and wording together	In different locations	No wording	Total
Carton	<b>119</b>	87	8	214
	<b>55.6%</b>	40.7%	3.7%	74.8%
Plastic bottle	4	<b>67</b>	0	71
	5.6%	<b>94.4%</b>	0.0%	24.8%
Glass bottle	0	1	0	1
	0.0%	100.0%	0.0%	0.3%
<b>Total</b>	123	<b>155</b>	8	286
	43.0%	<b>54.4%</b>	2.4%	100.0%

Source: ICF

Table 21. Relative location of the date mark and date wording for milk

Packaging format	Date and wording together	In different locations	Adjacent, but wording mixed with other text	Total
Carton	66	<b>87</b>	0	153
	43.1%	<b>56.9%</b>	0.0%	55.2%
Plastic bottle	22	<b>87</b>	2	111
	19.8%	<b>78.4%</b>	1.8%	40.1%
Glass bottle	0	4	0	4
	0.0%	100.0%	0.0%	1.4%
Plastic bag	4	5	0	9
	44.4%	55.6%	0.0%	3.2%
<b>Total</b>	92	<b>183</b>	2	277
	33.2%	<b>66.1%</b>	0.7%	100.0%

Source: ICF

### 3.3.5 Legibility of date mark and date wording

The research design was constructed to provide evidence on the sampled products' compliance with Article 13 of the FIC Regulation. Article 13 requires that mandatory food information (which includes the date mark and date wording) must be presented visibly, legibly and, where appropriate, indelibly on the food packaging<sup>38</sup>.

Although the majority of products were judged to be compliant with Article 13, fieldworkers reported problems with legibility of date mark and/or wording on 247 products sampled (10.8% of total). The incidence of such legibility problems ranged from less than 5% for fresh milk products up to 20.8% of the pre-prepared chilled pasta sampled.

The most common legibility problems reported were that the date mark and/or date wording were printed too small (affecting 6.6% of products sampled) and that the date mark was printed unclearly or with fading ink (affecting 2.2% of products sampled).

Excessively small print was the main legibility issue for 9 out of the 10 product types (pre-prepared fruit / vegetables being the exception). A typical example of problem reported was, "Datestamp on lid is small and the opposite way up to the wording relating to it" (a comment registered in relation to a sauce product purchased in Germany).

<sup>38</sup> FIC Regulation, Article 13 states that:

"1. Without prejudice to the national measures adopted under Article 44(2), mandatory food information shall be marked in a conspicuous place in such a way as to be easily visible, clearly legible and, where appropriate, indelible. It shall not be in any hidden, obscured, detracted from or interrupted by any other written or pictorial matter or any intervening material.

2. Without prejudice to specific Union provisions applicable to particular foods, when appearing on the package or on the label attached thereto, the mandatory particulars listed in Article 9(1) shall be printed on the package or on the label in such a way as to ensure clear legibility, in characters using a font size where the x-height, as defined in Annex IV, is equal to or greater than 1.2 mm.

3. In case of packaging or containers the largest surface of which has an area of less than 80 cm<sup>2</sup> the x-height of the font size referred to in paragraph 2 shall be equal to or greater than 0.9 mm."

Unclear printing and/or fading ink was the main legibility problem for pre-prepared fruit/ vegetables. Fading ink was a particular problem for date marks printed onto plastic bottles and bottle tops (and hence sauce and fresh milk). A typical example of problem reported was: *"Information was clearly displayed but the ink is very sensitive and if you touch it many times fades out"* (a comment relating to a pre-packaged loaf of sliced bread purchased in Greece).

Table 22 shows the incidence of legibility problems reported for all ten product types.

### **3.3.6 Products' remaining life**

A product's 'remaining life' is the period between the date of purchase and the date shown by the date mark, whether "best before" or "use by". The remaining life of each product purchased was calculated from the date mark displayed on the packaging and the date of purchase reported by the fieldworker. Figures A7.1 to A7.10 in Annex 7 show the results of these calculations for each product type.

There was wide variation in the remaining life of the products sampled within each product type. The widest variations were observed for fresh juice and sauce. For fresh juice, this variation is likely to reflect differences in product specification (the on-pack labels do not provide sufficient information to relate this to the processing technologies applied). For sauce, it may be due to poor stock rotation or an inconsistent approach to setting shelf life. Some of the fresh milk products had a longer remaining life due to higher levels of pasteurisation/ micro-filtration applied to some of the sampled products (see Table A7.1 in Annex 7).

Within all 10 product types, no significant variation was found between the average remaining life of products that displayed a "best before" date mark and the average remaining life of products that displayed a "use by" date mark (in terms of number of days).



Table 22. Legibility problems were reported by mystery shoppers for all product types

Legibility problem identified (no. products affected, and as % of all in-scope products)	Product type										
	Chilled fish	Fresh juice	Fresh milk	Hard cheese	Pre-packed sliced bread	Pre-prepared chilled pasta	Pre-prepared fruit/ veg.	Sauce	Sliced ham	Yoghurt	ALL
<b>too small</b>	<b>10</b>	<b>9</b>	<b>4</b>	<b>19</b>	<b>24</b>	<b>16</b>	1	<b>26</b>	<b>24</b>	<b>19</b>	<b>152</b>
	<b>5.3%</b>	<b>3.1%</b>	<b>1.4%</b>	<b>6.8%</b>	<b>9.7%</b>	<b>12.5%</b>	0.7%	<b>9.1%</b>	<b>10.1%</b>	<b>8.3%</b>	<b>6.6%</b>
date mark difficult to find	1	3	1	3	1	5	1	4	3	2	24
	0.5%	1.0%	0.4%	1.1%	0.4%	3.9%	0.7%	1.4%	1.3%	0.9%	1.0%
<b>date mark ink faded/ printing not clear</b>	3	3	4	5	3	2	<b>3</b>	13	6	3	45
	1.6%	1.0%	1.4%	1.8%	1.2%	1.6%	<b>2.2%</b>	4.5%	2.5%	1.3%	2.0%
wrong language/ incorrect translation	0	0	0	0	0	0	2	0	2	1	5
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	0.0%	0.8%	0.4%	0.2%
date mark does not give year	0	0	0	0	4	0	0	0	0	1	5
	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.4%	0.2%
date and wording on different sections of pack	1	1	0	1	0	3	1	1	0	1	9
	0.5%	0.3%	0.0%	0.4%	0.0%	2.3%	0.7%	0.3%	0.0%	0.4%	0.4%
not clear wording that relates to date mark	0	0	0	0	0	0	0	1	0	0	1
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
stickers on pack obscuring info	1	0	0	1	1	0	0	0	0	1	4
	0.5%	0.0%	0.0%	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%	0.4%	0.2%
other stated problem	0	0	0	0	0	0	0	0	2	0	2
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.1%
<b>All products with a legibility problem</b>	<b>16</b>	<b>16</b>	<b>9</b>	<b>29</b>	<b>33</b>	<b>26</b>	<b>8</b>	<b>45</b>	<b>37</b>	<b>28</b>	<b>247</b>
	<b>8.6%</b>	<b>5.6%</b>	<b>3.2%</b>	<b>10.3%</b>	<b>13.3%</b>	<b>20.3%</b>	<b>5.9%</b>	<b>15.7%</b>	<b>15.5%</b>	<b>12.2%</b>	<b>10.8%</b>
Total products	187	286	277	281	248	128	136	286	238	229	2,296

Source: ICF

### 3.4 Open-life and on-pack storage advice

Article 9(1)(f)<sup>39</sup> and Annex X<sup>40</sup> of the FIC Regulation require the display of any special storage conditions applying to the product and of any advice on the life of the product once the packaging has been opened be displayed (“open-life” advice). In addition, Article 25 of the FIC Regulation requires special storage conditions and/or conditions of use to be indicated, as well as the storage conditions and time limit for consumption of the product once the product has been opened<sup>41</sup>.

The data collected from the purchased products enable the compliance of the overall sample with these aspects of the FIC Regulation to be assessed.

For fresh juice and pre-prepared chilled pasta, a majority of the products sampled provided open-life advice (91.9% and 97.6% respectively). For the other product types, only a minority (from 7% to 48%) of the products sampled provided open-life advice. Where products did provide open-life advice it was either in the form of:

- Information on the number of days within which the product should be consumed once opened (this was present for the majority of the fresh juice and pre-prepared chilled pasta products that were sampled); or
- An instruction to consume immediately after opening (for all product types this was present on a minority of the products that were sampled).

The overall situation for storage advice was more complex than that for open-life advice. The research analysis found that storage advice provided on the food packaging generally included advice relating to storage temperature – either a maximum temperature or a temperature range. There was some variation by product type:

- Chilled products (such as chilled fish, dairy products, sliced ham, pre-prepared chilled pasta, and pre-prepared salad) were more likely to carry specific temperature advice than ambient products (such as sauce and bread). The exception was chilled juice (Table 25);
- For sauce and bread, on-pack information sometimes included temperature and storage advice for the unopened pack that was different to that given for reference once it has been opened.

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<sup>39</sup> FIC Regulation, Article 9(1)(f):

“1. [In accordance with Articles 10 to 35 and subject to the exceptions contained in this Chapter,] indication of the following particulars shall be mandatory: ...

... (g) any special storage conditions [and/or conditions of use]

<sup>40</sup> FIC Regulation, Annex X, point 1(b):

“...If need be, these particulars [date wording] shall be followed by a description of the storage conditions which must be observed if the product is to keep for the specified period;”

FIC Regulation, Annex X, point 2(b):

“...Those particulars [date wording] shall be followed by a description of the storage conditions which must be observed;”

<sup>41</sup> FIC Regulation, Article 25:

“1. In cases where foods require special storage conditions and/or conditions of use, those conditions shall be indicated

2. To enable appropriate storage or use of the food after opening the package, the storage conditions and/or time limit for consumption shall be indicated where appropriate”

There was also some variation by country:

- In Germany and the Netherlands, products displayed storage temperature advice alongside the date wording, regardless of whether the date type was “best before” or “use by”;
- In Sweden, products displayed advice on storage temperature alongside the date wording if the date type was “use by” but apart if it was “best before” (so in the latter case, the advice on storage temperature was not linked as obviously to the date mark);
- In Greece, Hungary, Poland, Slovakia and Spain, products displayed storage-temperature advice apart from the date wording;
- The text on yoghurts that provided advice on storage temperature generally displayed:
  - a maximum storage temperature in Germany, the Netherlands and Sweden,
  - a temperature range in Greece, Hungary, Poland, Slovakia and Spain.
- In Germany, the wording that was provided on storage temperature was the same across all the yoghurts sampled.

Table 23 shows the average open life by product type.

Table 24 gives a breakdown by product type of open-life information. Figures A8.1 to A8.4 in Annex 8 show variations in open life for product types whose open life varied across the eight Member States. These product types are fresh juice, fresh milk, hard cheese, and sauce.

Table 25 gives a breakdown by product type of on-pack storage advice related to temperature. Results for each product are provided in Annex 9. There is significant variation in maximum and minimum temperatures advised on products indicating storage temperature ranges (Figure A9.1 to Figure A9.8 in Annex 9).

*Table 23. Average open life by product type*

Product type	Mean	N	Standard deviation
Chilled fish	2.13	75	0.96
Fresh juice	3.09	261	1.14
Fresh milk	2.65	137	1.58
Hard cheese	2.32	40	1.20
Pre-packed sliced bread	1.98	47	0.95
Pre-prepared chilled pasta	2.57	88	0.77
Pre-prepared fruit/ vegetables	1.12	19	0.33
Sauce	33.15	47	20.99
Sliced ham	3.14	55	1.81
Yoghurts	1.00	2	0.00

Source: ICF

Table 24. Open-life information displayed on purchased products for all product types

Open-life information	Product type										
	Chilled fish	Fresh juice	Fresh milk	Hard cheese	Pre-packed sliced bread	Pre-prepared chilled pasta	Pre-prepared fruit/veg.	Sauce	Sliced ham	Yoghurt	ALL
No open life (number and %)	<b>104</b> <b>55.6%</b>	23 8.0%	<b>143</b> <b>51.6%</b>	<b>231</b> <b>82.2%</b>	<b>199</b> <b>80.2%</b>	39 30.5%	<b>102</b> <b>75.0%</b>	<b>236</b> <b>82.5%</b>	<b>172</b> <b>72.3%</b>	<b>212</b> <b>92.6%</b>	1,461 63.6%
Number of days of open life stated (number and %)	75 40.1%	<b>260</b> <b>90.9%</b>	115 41.5%	40 14.2%	47 19.0%	<b>88</b> <b>68.8%</b>	19 14.0%	47 16.4%	55 23.1%	2 0.9%	748 32.6%
Eat immediately (number and %)	8 4.3%	3 1.0%	19 6.9%	10 3.6%	2 0.8%	1 0.8%	15 11.0%	3 1.0%	11 4.6%	15 6.6%	87 3.8%
Total products	187	286	277	281	248	128	136	286	238	229	2,296

Source: ICF

Table 25. On-pack storage relating to temperature of purchased products for all product types

On-pack storage relating to temperature	Product type										
	Chilled fish	Fresh juice	Fresh milk	Hard cheese	Pre-packed sliced bread	Pre-prepared chilled pasta	Pre-prepared fruit/veg.	Sauce	Sliced ham	Yoghurt	ALL
Products showing no storage advice/ specific temp (number and %)	5 2.7%	3 1.0%	1 0.4%	4 1.4%	85 34.3%	5 3.9%	15 11.0%	14 4.9%	11 4.6%	2 0.9%	145 6.3%
Products showing specific temperature or temperature range (number and %)	<b>166</b> <b>88.8%</b>	40 14.0%	<b>248</b> <b>89.5%</b>	<b>246</b> <b>87.5%</b>	0 0.0%	<b>104</b> <b>81.3%</b>	<b>99</b> <b>72.8%</b>	24 8.4%	<b>187</b> <b>78.6%</b>	<b>220</b> <b>96.1%</b>	1,334 58.1%
Products showing advice on storage, no temperature stated (number and %)	16 8.6%	<b>243</b> <b>85.0%</b>	28 10.1%	31 11.0%	<b>163</b> <b>65.7%</b>	19 14.8%	22 16.2%	<b>248</b> <b>86.7%</b>	40 16.8%	7 3.1%	817 35.6%
Total products	187	286	277	281	248	128	136	286	238	229	2,296

Source: ICF

### **3.5 Summary and conclusions**

The market research yielded a large number and wide distribution of product samples as well as a high level of detail on the labelling of the sampled products. Overall, a good level of consistency was achieved in the purchasing. Where there was variance from the precise product specification (e.g. single pot yoghurts vs. four-pack yoghurts) it was within acceptable bounds and has added interest to the findings.

Among the points of interest arising are the:

- differences among Member States in the predominant approach to date labelling and storage advice for the same product type, and even for the same product;
- differences by type of product in the predominant approach to date labelling;
- relatively few instances of date wording that did not meet the requirements of the FIC Regulation;
- relatively high frequency of problems with the legibility of the date mark.

Table 26 provides an overall summary of the results for each food product. These results informed the interviews of food industry stakeholders (food business operators, national competent authorities, and various organisations that represent food sector or other stakeholder interests at EU level) in the final phase of the study.

Table 26. Overview of results for each product type purchased during the mystery shopping in terms of key parameters

Product description	Consistency of date mark type applied* (exceptions)	Food temp. (unopened pack)	Main packaging formats	Storage temp. advice	Remaining life [mean value across all products purchased that indicate expiry date]	Once opened advice [mean value across all products purchased that indicate number of days open life]	Location / legibility of date mark and associated wording
<b>Chilled Fish:</b> Pre-packed smoked salmon N=187	BB = 36 (19.3%) <b>UB = 141 (75.4%)</b> Other = 10 (5.3%), including one instance of BB AND UB (Mainly BB: EL, SE) (Mainly UB: DE, HU, PL, SK, ES) (Split: NL)	Chilled	Vacuum packed plastic, with or without cardboard sleeve	Chilled product: more likely to have storage temperature range DE, NL mainly use max. storage temperature linked to date mark	[15 days] (DE 6 days)	56% products no open life stated [2.1 days (n=75)] SE, ES higher open life (max 7 days) Home freezing advice on 8 products: 4 'do not freeze'	78% date & wording appear together 13% unclear
<b>Fresh Juice:</b> smooth fresh orange juice N=287	<b>BB = 244 (85.3%)</b> UB = 32 (11.2%) Other = 10 (3.5%) (BB predominates in all 8 MS)	Ambient or Chilled	Cardboard carton with plastic cap, plastic bottle	Specific storage temperature advice less likely	[182 days] NL, ES, SE purchased products had significantly shorter remaining life	90% state open life [3.1 (n=261)] ES, SE	Plastic bottles: 95 % date and wording different locations Cartons: 56% date & wording appear together 23% of plastic juice bottles unclear/ difficult to read; Only 8% of cartons
<b>Fresh Milk:</b> semi-skimmed cows' milk N=276	BB=89 (32.5%) <b>UB=178 (64.3%)</b> Other = 9 (3.2%) (Mainly BB: DE, NL, SE) (Mainly UB: EL, HU, SK, ES, PL)	Chilled	Plastic bottle with plastic cap or cardboard carton with plastic cap (PL glass milk bottle)	Chilled product: more likely to have storage temperature range DE max. storage temperature linked to date mark; NL link not so direct	[9 days] consistent across all countries	51% no open life stated 'consume immediately' (n=21) [2.7 days (n=137)] No correlation found between level of pasteurisation and open life	Plastic bottles: 78 % date and wording different locations Cartons: 43% date & wording appear together 25% of plastic milk bottles unclear / difficult to read; only 3% of cartons were criticised
<b>Hard Cheese:</b> sliced cheddar or other hard cheese N=281	<b>BB=230 (81.9%)</b> UB=39 (13.9%) Other = 12 (4.3%) (Mainly BB: DE, EL, HU, PL, SK, ES) (Mainly UB: HU) (Split: SK)	Chilled	Vacuum packed, may be re-sealable	Chilled product: more likely to have storage temperature range DE max. storage temperature linked to date mark	[64 days] (EL 100 days)	82% no open life stated 'eat immediately' (n=10) [2.3 days (n=40)]	85% date & wording appear together 15% wording/ date unclear difficult to read
<b>Pre-packed sliced Bread:</b> white, medium-sliced N=248	<b>BB = 214 (86.3%)</b> UB = 15 (6.0%) Other = 19 (7.7%) (Mainly BB: DE, EL, HU, PL, SK, ES, SE) (NL has "sell by" only)	Ambient	Plastic bag with clip tie	Contradictory storage advice across different MS, e.g.: EL most frequent advice to store in fridge; PL advice to store at room temp.	[11 days] (EL =18 days, NL=0 days)	80% products state no open life [2.0 days (n=47)] Advice on home freezing provided on 7 products	67% date & wording different locations: date on clip tie 32% unclear

Product description	Consistency of date mark type applied* (exceptions)	Food temp. (unopened pack)	Main packaging formats	Storage temp. advice	Remaining life [mean value across all products purchased that indicate expiry date]	Once opened advice [mean value across all products purchased that indicate number of days open life]	Location / legibility of date mark and associated wording
<b>Pre-prepared chilled pasta</b> with a vegetable filling N=128	<b>BB = 69 (53.9%)</b> UB = 54 (42.2%) Other = 5 (3.9%) (Mainly BB: DE, EL, NL, SE) (Mainly UB: HU, PL, SK, ES)	Chilled	Vacuum packed in plastic	Chilled product: more likely to have storage temperature range DE max. storage temp. linked to date mark	[31 days]	69% state open life [2.6 days (n=88)] No correlation between remaining life and period to consume once opened	59% in different locations 36% wording/ date unclear difficult to read {most comments about difficulty of finding/ text too small]
<b>Pre-prepared fruit/vegetables:</b> pre-packed green salad/ pre-cut lettuce leaves N=136	<b>BB = 15 (11.0%)</b> <b>UB = 96 (70.6%)</b> Other= 25 (18.4%) (Mainly BB: SE) (Mainly UB: the 7 other MS)	Chilled	Plastic bag, plastic box with plastic bag wrapper	Chilled product: more likely to have storage temperature range NL max. storage temperature	[3.8 days] no difference in remaining life between products with UB or BB dates	75% products state no open life 1.1 days (n=19)	71% date & wording appear together 15% no wording 18% unclear
<b>Sauce:</b> tomato ketchup in squeeze bottle N=286	<b>BB = 282 (98.6%)</b> UB = None Other = 4 (1.4%) (BB predominates in all 8 MS)	Ambient	Plastic bottle with plastic cap and nozzle	Ambient product: temperature advice	[321 days], (PL 270) No correlation between remaining life and period to consume once opened	83% no open life stated [33.2 days (n=47)] EL, HU, SK more likely to state open life, SK mean 60	70% in different locations 38% wording/ date unclear difficult to read (dates rub off tops)
<b>Sliced ham:</b> pre-packed sliced prosciutto / serrano dry-cured ham' N=238	<b>BB = 174 (73.1%)</b> UB = 58 (24.4%) Other = 6 (2.5%) (Mainly BB: DE/, EL, NL, ES, SE) (Mainly UB: HU, PL, SK)	Chilled	Vacuum packed in plastic	Chilled product: more likely to have storage temperature range	[71 days], (ES 125 days) Correlation between products with longer life & period to consume 'once opened'	72% no open life stated 'eat immediately' (n=11) [3.1 days (n=55)]	69% date & wording appear together 28% unclear
Strawberry <b>Yoghurts</b> in a multipack N=229	BB = 73 (31.9%) <b>UB = 156 (68.1%)</b> Other = None (Mainly BB: DE, SE) (Mainly UB: EL, HU, NL, PL, SK, ES)	Chilled	Plastic pots, with cardboard sleeve	Chilled product: more likely to have storage temperature range	[18 days] (EL 28 days)	93% no open life stated 'eat immediately' (n=15)	Multi-pack: 62% date & wording appear together Single pot: 97% date & wording in different locations 30% unclear, but related to single pots

\* BB means "best before" date mark; UB means "use by" date mark; "Other" means a date mark that is neither definitely a "best before" date mark nor definitely a "use by" date mark

Source: ICF



## 4 Stakeholder consultations on date marking practice

Interviews were undertaken with 74 food sector stakeholders to discuss findings from the desk research and market research phases of the study.

### 4.1 Research design and method

Stakeholders from the three following groups were interviewed:

- **National Competent Authorities (NCAs)**, specifically:
  - NCAs of the Member States in which the market research was undertaken (i.e. Germany, Greece, Hungary, Netherlands, Poland, Slovakia, Spain, and Sweden); and
  - NCAs from European countries<sup>42</sup> that are members of the EU Platform on Food Losses and Food Waste or of the Working Group on Food Information to Consumers.
- **European organisations**, specifically:
  - trade associations representing food manufacturing, retail and service sectors;
  - consumer organisations; and
  - organisations representing operators of food banks.
  - Priority was given to those who are members of the EU Platform on Food Losses and Food Waste or are otherwise active in food waste prevention.
- **Food business operators (FBOs)**, giving priority to:
  - producers of the food products that were purchased in the market research;
  - retailers from whom those target food products were purchased; and
  - food banks and other charity organisations involved in the recovery and redistribution of foods.
- Most of the FBO representatives were employed in the quality assurance department of their respective firms. Others worked in corporate social responsibility, public affairs or marketing functions.

Positive responses were received from NCAs from 19 countries, 16 European organisations, and 39 FBOs. In-depth interviews were conducted with these stakeholders using a "semi-structured" format to allow focused, conversational, two-way communication between respondent and interviewer.

Semi-structured interviewing starts with more general questions or topics and allows the interview to evolve and address issues and topics that may not have been foreseen in the original topic guide. This approach enables an open discussion with each stakeholder that covers a broad set of issues (such as the way food practices in the food chain are impacting on food waste). This means that the interview is not limited to coverage of date marks, associated advice and information provided to consumers on the pack, and how that information and advice may be leading behaviours.

The interview topic guides for NCAs, European organisations, and FBOs are presented in Annexes 10, 11 and 12 respectively. Interviewers were also given a list of issues identified in the analysis of the market research data for use as discussion points.

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<sup>42</sup> This includes one country that is not an EU Member State – Norway.

The qualitative data obtained from the interviews were coded for analysis. A synthesis of the results was then prepared. Findings from the interviews have been grouped under to the following topic headings:

- Stakeholders' understanding of the terms "use by" and "best before";
- Factors in producers' choice of date mark type;
- Factors that determine location, format and legibility of the date mark;
- Factors in the determination of product shelf life;
- Storage advice and open life advice;
- Use of date marking in managing the food supply chain;
- Enforcement of date marking rules;
- Barriers to and facilitators of better utilisation of date marking in relation to food waste prevention;
- Stakeholders' views on Annex X of the FIC Regulation

The rest of this section considers the evidence obtained on each of these topics through the interviews, also taking into account (where relevant) evidence from the previous market research and desk research.

#### **4.2 Stakeholders' understanding of "use by" and "best before"**

In general, awareness of the FIC Regulation's requirements in relation to date marking of foods was high. The FIC Regulation seems to be well regarded; no interviewees raised major concerns about it.

NCA's and most of the European organisations clearly understood the definitions of "use by" and "best before" date marks in their respective national languages. Many interviewees from both NCA's and European organisations did not have a strong understanding of the practices that producers use to choose one date mark type over another or to set a particular date. Even so, European trade associations did understand that variation in their members' practices would lead to differences in the date marks placed on products. One stated that:

*"The use of durability dates also depends on producers' choice and retailer conditions in each Member State or region, and of course consumer habits in each country – for the same product you will have different ways of placing the date across the EU."*

*Trade association*

The market research carried out for this study supports the associations' view that there are variations in the usage of "best before" and "use by" date marks within the same product groups across different Member States, as discussed in Section 3.3.3 and summarised in Figure 5. (Reasons given for choosing one type of date mark over the other are discussed in Section 4.3).

The majority of FBOs gave clear answers that demonstrated an accurate understanding of the difference between "use by" and "best before" (in their respective languages) in line with the FIC Regulation. In a minority of instances, some producers understood "use by" and "best before" to be more or less the same, and others viewed the difference to be on the basis of overall shelf life (with shorter shelf lives necessitating a "use by" date mark, and longer shelf lives necessitating a "best before" date mark). Nonetheless, there is wide variation in producers' views of what foods pose a higher risk to food safety and should therefore be subject to a "use by" date mark - even among the producers who demonstrated an accurate understanding of the difference between "use by" and "best before".

Producers have the responsibility for displaying a date mark (and associated date wording) on the packaging of their products. Most of the producers interviewed stated that they act in line with the FIC Regulation, although one stated that it does not put a date mark on bagged salad and that it considers "use by" and "best before" to be different ways of saying the same thing.

### **4.3 Factors in producers' choice of date mark type**

#### ***Producers' perceptions of product characteristics and food safety***

The most common determinants of producers' choice of date mark are their perceptions of product characteristics and food safety, which is consistent with the FIC Regulation. In particular, producers cited either the presence/ absence of food safety risks or microbiological concerns. For some products, the absence or presence of food safety processes during production (such as heat treatment for pasta or pasteurisation for juice) were given as the deciding factor for choosing between "use by" and "best before".

Producers often linked their food safety concerns to the overall shelf life of their product. Producers of products with longer shelf lives (e.g., cheese, ketchup) tended to cite [long] overall longevity (sometimes described as "microbiological stability") as their reason for applying a "best before" date mark. Producers of products with shorter shelf lives (e.g., fish, milk) had a greater tendency to cite food safety concerns as a reason to choose to apply a "use by" date mark.

#### ***Decision on basis of shelf life or storage conditions***

A few producers explained their choice without reference to food safety or product characteristics, which is not consistent with the FIC Regulation. For example, one producer stated that the type of date mark that it applied to a product was based simply on the storage conditions that it had specified for that product. Hence, a "use by" date mark was applied to chilled products, and a "best before" date mark was applied to ambient products.

In another example, some dairy producers reported that they base their choice of date mark for a given product directly on the length of shelf life, without reference to food safety concerns or product characteristics. They apply a "use by" date mark to products with a shelf life shorter than two or three months (depending on the producer) and a "best before" date mark to products with a shelf life longer than that<sup>43</sup>.

#### ***Factors beyond the producer's product knowledge***

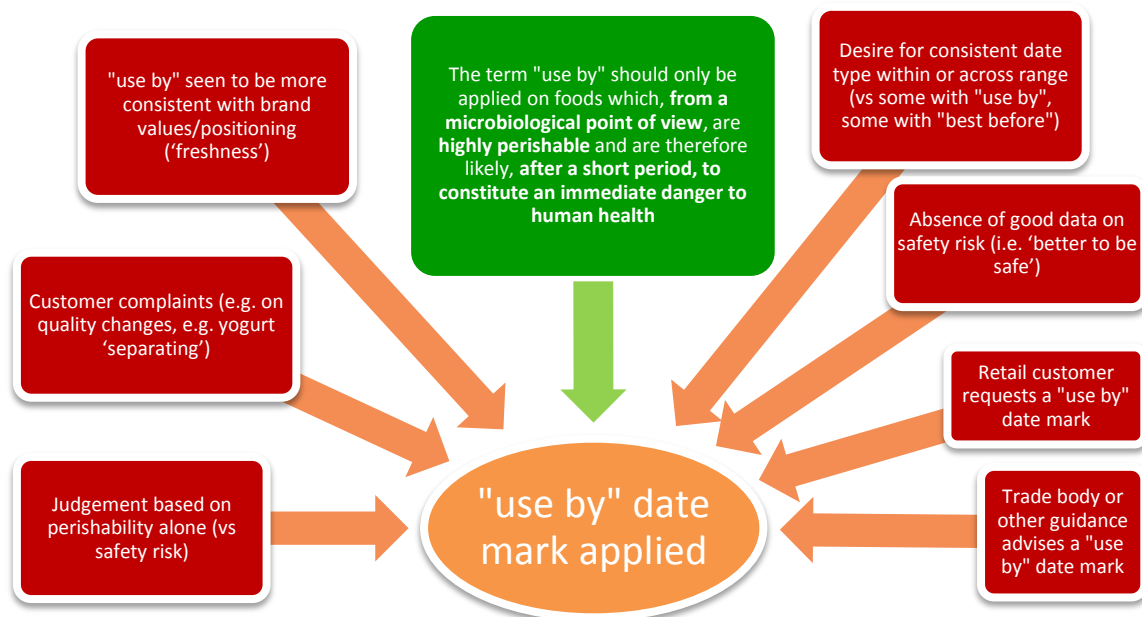
Although the decision of whether to apply a "use by" date mark or a "best before" date mark is a matter for the producer, the producer can be influenced by factors beyond its product knowledge. As a result, that producer may decide to apply a "use by" date mark to a product for which a "best before" date mark may be more appropriate. Figure 6 summarises the factors stated by FBO interviewees that may cause producers to choose "use by" date marks instead of "best before" date marks.

Two particular factors were discussed extensively in interviews with FBOs, namely common practices in national markets (often referred to by interviewees as "local market norms") and consumers' understanding of "use by" and "best before".

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<sup>43</sup> By contrast, the market research undertaken for this study suggests that a producer's choice of date mark for a product does not depend on that product's remaining life (Sections 3.3.6 and 5.4)

Figure 6. Factors favouring the application of "use by" date marks over "best before" date marks



Source: ICF

### Common practices in national markets

The choice of date mark ("best before" or "use by") is partly driven by what FBOs (especially retailers) think consumers in a given market will prefer or expect to see due to common practices within that market. Retailers reportedly exercise more influence over the choice of date marks applied to retailers' own-brand products than to company-branded products.

For instance, a ham producer stated that, although it applies a "best before" date mark on its products for its domestic market, retailers in certain export markets request a "use by" date mark. A similar situation was mentioned by a dairy producer. The firm stated that, although it applies a "best before" date mark to all products for sale in its home market, it applies a "use by" date mark to products for sale in European export markets where "use by" was the standard type of marking in that jurisdiction.

Although fresh fruit and vegetables which have not been peeled, cut or similarly treated are exempt from date marking, some producers reported that they sometimes apply a date mark to their packaging because of common practices within a national market or because of retailer influence.

### Consumer understanding of "use by" and "best before"

Interviewees reported few cases of consumer behaviour directly leading to changes in date marking practices. Focus group testing was mentioned by one FBO. Another referred to consumer testing that occurred alongside product development. (This sort of testing would not specifically focus on a particular aspect of date marking, but would contribute to the FBO's overall knowledge of how consumers use its products.)

Most of what FBOs had to say about consumer behaviour was anecdotal and rooted in the interviewees' personal experience. Only one FBO mentioned conducting specific consumer research on how "use by" and "best before" are understood, concluding that consumers were not aware of the differences in labelling. FBOs generally perceive consumer understanding of "use by" and "best before" to be poor. This has led some

producers to “err on the side of caution” by applying a “use by” date mark. One dairy producer described the situation as such:

*“Marking products with “use by” is not great for food waste because consumers get scared and throw away products, but “use by” ensures [i.e., provides a sense of security to] the industry, as you can never be sure how consumers store and use the products.”*

*Dairy producer*

Some FBOs believe that consumers are more likely to treat the date mark as an indicator of food safety rather than of quality, regardless of the type of date mark applied.

There were some instances of FBOs learning about consumer behaviour through customer complaints. A few stated that complaints had led them to add the caveat “if unopened” to the wording accompanying a “best before” date mark.

NCA were, for the most part, not seen by FBOs (or by themselves) as having a significant influence on the choice of date mark. However, the role of the NCA in enforcing date wording stipulated by regulation was mentioned. For example:

- one producer indicated that it was aware that date labelling was the subject of enforcement, and that this was why it uses the stipulated “best before” date wording on its products, despite not necessarily agreeing that that wording provides clarity for consumers;
- one retailer had focus group results that suggested an alternative “best before” wording performed better for a particular product. It attempted to change the wording to the non-standard text but was instructed by its NCA to revert to the official wording as the alternative was not compliant with the FIC Regulation;
- one producer mentioned that when exporting to a new market it would first send an image of its proposed label, with all relevant wording, to the local NCA for approval; and
- one producer described how the NCA in an export market had wielded a more direct influence on their choice. When exporting a yoghurt that had been assigned a “use by” date mark, the producer received an official letter from the NCA requiring that they switch the date mark to “best before”. The producer complied with the request but was surprised and felt that “best before” did not appropriately safeguard consumers in the case of yoghurts.

Many FBOs raised the issue of “use by” and “best before” date wordings, and whether they were understood as intended by consumers. Many interviewees thought the date wording specified by the FIC Regulation makes sense and is helpful. Others stated that their own comprehension of the terms was informed by their technical background. There were no indications of specific problems with any one national wording. However, one FBO in Germany indicated that, while the English “best before” in English would exclude the marked date from the period of minimum durability, the German equivalent “*mindestens haltbar bis*” would include the marked date in the period of minimum durability. This could present challenges for FBOs when deciding what date to use, especially for FBOs who export and those who use multilingual packaging.

Stakeholders were divided on whether there would be merit in changing the wording accompanying a “best before” date mark to communicate more effectively that it is an indicator of product quality. Some believed that a different form of words would be clearer, such as “best quality before” or “best before, but still consumable after”. Many thought that such wording would be clear but insufficiently concise. Others believed that it would be best not to change date wordings because consumers are only now becoming accustomed to them, and the priority should be to increase awareness and

understanding of the date wording currently in use. Several thought changes would not matter because consumers do not read the wording.

Producers generally viewed the formulation of date wording as being outside their control and responsibility.

#### **4.4 Factors that determine location, format and legibility of the date mark**

According to the producers that were interviewed, the location of the date mark (and date wording) depends on common practices in national markets as well as on a concern to display the date mark in an obvious location. No producer raised the issue that displaying the date mark separately from the date wording might impede consumer understanding. When asked if it might be, producers stated that displaying date mark and date wording apart from each other was standard for certain products (for example, the date being displayed on a fastening clip for sliced bread products, and the date wording on the plastic packaging) and something that consumers were accustomed to.

As the market research showed (Section 3.3.4), certain product types are more likely to display date mark and wording alongside each other and other product types are more likely to show them apart. Clearly, displaying date mark and date wording alongside each other makes them easier to understand. However this is difficult to achieve on certain packaging formats, especially those that are not flat, because – as producers explained – date marks are generally printed at a separate stage from the other information on the packaging, and the way in which they are printed on the packaging depends on the equipment used.

The printing equipment and methods can affect legibility. No interviewees mentioned any specific problems with making dates legible. However, the market research revealed problems with legibility of date mark and/or wording on 11% products sampled, making it the most widespread problem encountered (Section 3.3.5).

Producers did not give any insights into how the choice of date mark format (e.g., day/month/year, or month/year) is made. All products sampled during the market research displayed date marks in a format in line with the provisions of the FIC Regulation.

#### **4.5 Factors in setting product shelf life**

Producers' practices in setting product shelf life vary widely and are generally consistent with the factors explored by the WRAP study of 2015 (WRAP, 2015) as discussed in Section 2.4.

##### ***Product testing results***

Producers tend to set shelf life during product development. Shelf life is established through tests or determined on the basis of producers' knowledge of similar products in the same category. Some producers mentioned specific methods or standard procedures for food safety testing set by standardisation bodies such as AFNOR (Association Française de Normalisation), BRC (British Retail Consortium) and IFS (International Featured Standards). Most producer descriptions of testing, however, indicated that decisions were made either internally or in partnership with testing laboratories. There was little mention of external guidance on how to conduct shelf life tests.

For products given a "use by" date mark, producers mentioned measuring *Listeria* growth and predictive microbiological modelling. If microbiological risk is found not to be a factor, tests are conducted to determine a "best before" date.

Testing for determination of a "best before" date involves both qualitative and quantitative aspects. Producers mentioned inspecting organoleptic properties at

various stages in the product's lifespan and using consumer acceptance testing. Consumer acceptance testing includes considering changes in product condition that would be unwelcome to customers – e.g., changes in appearance, taste or smell – regardless of whether those changes affect safety or quality. The characteristics tested are product-specific and vary significantly among producers. Parameters mentioned by FBOs in the context of “best before” testing are:

- appearance;
- colour;
- smell;
- taste;
- texture or consistency;
- characteristics related to functionality (e.g. spreadability, melting point);
- mould growth;
- staleness;
- degradation;
- freshness; and
- weight loss.

Some differences in where tests are undertaken were reported. Most producers stated that they perform the tests themselves. Some use external laboratories. Others use a combination of internal and external testing.

Many of the producers mentioned testing procedures for monitoring, controlling and fine-tuning shelf life. This is especially common for fresh produce, for which factors outside the producer's control (such as weather conditions or the time of year) can have a significant impact on shelf life. In these cases, producers commonly have a storage room in which produce is constantly monitored. Testing of other products was reported to occur less frequently. One producer reported undertaking tests every month; another mentioned testing yoghurts twice a year. Others did not specify any particular frequency.

A dairy producer who stated that it determined the use of “best before” and “use by” based on overall shelf life described its product testing procedure thus:

*The microbiological results from the accredited laboratory decide on the type of label. The accredited laboratory performs tests according to the valid legislation for the given product type at the start and end of the “use by” and “best before” time. The product is also assessed by sensors in the laboratory and “use by” or “best before” is determined based on these tests. Then, until the end of “use by” or “best before”, products are stored at the required temperature in an accredited laboratory – we call this a ‘storage test’, and on the basis of this test the product's durability is finally determined.*

*Dairy producer*

### **Retailer influence**

Most retailers stated that they trust the dates applied by their suppliers but push for a minimum life on receipt (MLOR) wherever possible. Several retailers and a number of producers of retailers’ own-brand products indicated that this influence is stronger for retailers’ own-brand products. For example, a dairy producer stated:



*Of course, sometimes if we are producing cheese for a private label<sup>44</sup>, we might receive a requirement from the customer that they want 120 days shelf life on a product, and in such an instance we then have to give them a cheese with 120 days of life.*

*Dairy producer*

No producer explicitly stated that retailer pressure had led it to increase the shelf life of a product. Many did mention that retailer pressure had played a role in their decisions to invest in innovations such as:

- “clean rooms”<sup>45</sup>;
- innovative packaging;
- new packing methods; and
- changes in recipe.

Some producers stated that a longer shelf life on a product can provide a competitive advantage. A dairy producer explained:

*If you're competing with another producer, this might also end up being a consideration. If company A can produce a product with two weeks shelf life and company B makes the same thing but with four, this could play into retailers' decisions.*

*Dairy producer*

### **Minimum Life on Receipt (MLOR)**

Many of the producers and retailers stated that MLOR is a key parameter in their contracts. One interviewee with a background in retail suggested that this might affect some producers' shelf life calculations but did not identify those producers or the relevant product categories. This suggestion was not confirmed by any producer interviewed.

Several producers stated that retailers or wholesalers request a specific number of days of MLOR. These producers make logistical decisions (about which locations to deliver their product from and when to do so) on the basis of that number of days. This issue is more important for producers of products with relatively short lives than for producers of products with relatively long shelf lives; however, the latter producers did mention this issue as being of importance to them. Just one producer stated that MLOR is almost always stated as a percentage of total shelf life rather than as a specific number of days.

No producer claimed that MLOR considerations influence its practices when setting a “use by” or “best before” date. MLOR was, however, cited as a reason to invest in innovations (see above).

### **Caution by producers**

Many producers set “best before” dates that are cautious, i.e., shorter than necessary, because they consider the “best before” date to be their guarantee of quality and thus that it needs to be correct whatever the circumstances. Testing was frequently described as anticipating the “worst case scenario.”

The need to avoid consumer complaints was mentioned frequently by producers, including those who produce products for sale under a retailer's brand. As one producer stated:

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<sup>44</sup> The FBO was using the term “private label” in the sense of a product manufactured or provided by one company for offer under another company's brand, also known as a “phantom brand”.

<sup>45</sup> “Clean rooms” are processing areas in which environmental pollutants, including microbes, are kept at very low levels by means of air filtration.



*Our performance is measured on service and delivery but also against customer complaints, so it's in our interest to make sure that the right date is on the pack.*

*Fresh produce producer*

### **Shelf life and consumers' perceptions of freshness**

Interviews with FBOs suggest a hesitancy on the part of producers to extend the shelf lives of products that are perceived as "fresh." Consumer purchasing trends have favoured products without preservatives and with more "natural" ingredients. Such characteristics can seem incompatible with long shelf lives, even though they are compatible. As one producer stated:

*We also consider observed product specifications. For example, we might offer a fresh product, and if you put a fresh product on the market with a very long shelf life, that doesn't quite make sense.*

*Dairy producer*

Another producer described a consumer-perception problem with products (such as cheeses) that had traditionally been sold chilled but which, as a result of technological innovations, could now be stored at ambient temperatures:

*When there are such products displayed in store at an ambient temperature, however, it can be difficult for both consumers and authorities to understand that this is okay. We had one case where the retailer had our cheeses standing out and the authorities were about to throw out all the cheese because it was [supposedly] a case of breaching the regulation. So it's not the regulation itself that is an issue, but rather a problem of consumer perception.*

*Dairy producer*

One producer stated that retailers might be overly cautious about the shelf life of pre-packed salad because of their concerns about consumers' perceptions of freshness:

*If we say that the shelf life is 9 days, retailers might choose to set 7 days instead so that they have a better chance the salad still looks great up until the last day.*

*Fresh produce producer*

### **The cold chain and chilled-product storage temperatures**

Many producers stated that they could not assume that retailers and consumers would maintain the integrity of the cold chain. They factor cold chain interruptions and prolonged storage at ambient temperatures into the testing of chilled products. Consequently, the product lives established are shorter than would be possible if the integrity of the cold chain were maintained until consumption.

A few countries have introduced legal requirements (e.g., Denmark, Finland, Sweden and Norway) or guidance (e.g., Austria) on storage temperature. There is some variation in what these laws require. Sweden is working towards harmonised temperature standards among the Nordic countries with the aim of facilitating food exports and maintaining the cold chain.

Some producers also stated that they factor the variations in retailers' storage temperatures between different countries into their product life testing and hence into the determination of product shelf life. For example, they stated that they know the typical temperatures for storing chilled products to be 5°C in Denmark, 6°C in Finland, 8°C in Sweden and 10°C in Germany. They also stated that in some countries these temperatures are mandated by NCAs, whereas in other countries temperatures are advised by local trade association guidance or are simply a matter of customary practice. One such producer stated:

*It is usually said that if you lower the temperature by 1 degree you win one day in duration. So, on a product we are selling to the consumer market in Sweden we*

*have a storage temperature of 8 degrees, and maybe we have 7 days of duration; but if we sell it to Finland, we can put 8 days duration and if we lower the temperature further, we can have 9-10 days duration. So, on the same product we might have different durations because we have specified different storage temperatures.*

*Fresh produce producer*

Another such producer stated that it tests products explicitly on the basis of a cold chain guaranteed by a particular customer.

Other producers did not claim exact knowledge of storage temperature variations across countries or of their customers' storage temperatures. One such producer stated, however:

*What is interesting is that display cases in other countries will be kept much colder, at two degrees for example. This is also true for very hot countries. In Germany, by contrast, the display cases are not so cold. I don't have any proof for this, but this is what I've heard elsewhere too.*

*Dairy producer*

These producers therefore test products on the basis of a "worst case scenario": either a highest likely chilled temperature or, in the case of fresh produce, ambient conditions.

### **NCA influence**

NCA influence on product life reportedly extends only to defining maximum storage temperatures in national legislation. A poor understanding of regulation by some producers led to a perception of influence, however. For example, one producer who claimed that the shelf life used for fresh milk (7 days) was prescribed by EU regulation.

### **Retailer controls**

Some retailers conduct testing of product life (as well as quality control of product information labels). One retailer explained:

*We trust the dates our suppliers set, however, we do our own testing to ensure that the date marks set by the producers are correct. When doing this, we conduct both sensory and microbiologic analyses. This is mainly on the products that carry our own name, as these are the products we can affect the most.*

*If it happens that the date is incorrect, we keep a dialogue and ask the supplier to change. It is however very rare that the supplier's date setting is incorrect. If the producer's date is not correctly set, we discuss this with them in order to establish the cause for the discrepancy—was it an exception or has this been seen before—and then we request they get back to us with an analysis. We set requirements that the producers/suppliers should have established routines for such analysis.*

*Retailer*

Another retailer described conducting similar tests, stating that they did so for between 10-20% of cases, mostly for products coming from smaller suppliers.

Such routines might be important for retailers to ensure food safety, but having more rigorous control of suppliers' date marking practices could also help retailers to reduce

their own waste and loss. Every additional day of shelf life for retailers means more flexibility and a greater prospect of being able to sell the product.<sup>46</sup>

As one retailer stated:

*We also negotiate with some producers so that they supply their products as soon as they are produced (we have more time to keep them on shelves) but we also try to encourage them to put 'the longest date' that is allowed by the law (for example, if the law allows 20 days before production and consumption and producer stipulates 14 days, we have clear case to stretch it here).*

*Retailer*

Although there is no such legal requirement, this reference to an unspecified law indicates a reticence on the part of the retailer to push the issue too far without an appropriate mandate.

Some retailers mentioned that the variation in date marking practices for similar products has led to them work more closely with their suppliers to foster greater consistency of approach.

## **4.6 Storage advice and open life advice**

### ***Storage advice and rationale***

Several producers mentioned that they include storage advice such as "keep in a cool, dry place" or "keep refrigerated" on the label. Others mentioned that they include a specific temperature for chilled products. One such producer said the choice of storage temperature depends on product type. Another producer stated that the storage temperature that it displays depends on the cold chain that could be guaranteed by the retailer.

The data gathered during the market research conducted for this study suggests that temperatures specified on product packaging tend to be lower than the standard maximum retail temperatures mentioned by interviewees. For example, although the temperature for shelf life testing mentioned by producers that send products to the Swedish market is 8°C, the maximum storage temperatures listed on ham, yoghurts and salad bought in Sweden for this study are 7°C, 6°C and 5°C respectively. In addition, storage advice for products of the same product type was often found to vary or even be contradictory across different markets, potentially leading to further confusion.

Some producers felt that the large amount of information they need (for example, because of retailer influence, common practices in national markets, or legal advice) dilutes their ability to appropriately communicate "best before" or "use by", and further contributes to consumer confusion. These interviewees were resistant to inclusion of any additional wording about the date, considering it to be "information overload".

One retailer described the process that it uses to establish on-pack storage or open life advice:

*Always when a particular type of food requires, we also include storage conditions and / or conditions of use on the packaging. This will always result from consultations with the manufacturer, customers, their compliance officers, and after consultation with an external law firm.*

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<sup>46</sup> One study found that each additional day of shelf life reduced total waste by 42.8 percent, while increasing on-shelf availability by 3.4 percent. This had the largest impact on products with shelf lives of eight days or less. Source: Broekmeulen et al. (2016) *Sell more, waste less. A report by the ECR Shrinkage & On-Shelf Availability Group*.

Retailer

Only one FBO described NCA influence as playing a role in deciding storage advice. A retailer described switching from using "keep cool" to "keep cool and dry" based on advice received from the NCA that "keep cool" was being understood as instructions to store in the refrigerator.

#### **Open-life advice and rationale**

Open-life advice (i.e. instructions about how to keep a product fresh and extend its life once opened) was a contentious matter. Many producers stated that they only include such information at the specific request of their customers. Concerns about the lack of knowledge of consumers' treatment of products influence the information that producers put on the pack. Consequently, either the stated open life would be set intentionally short (at just a few days) or the pack would provide advice such as "consume immediately after opening". One dairy producer described why it prefers not to include such advice, explaining that:

*You can imagine you have a breakfast table with a nice camembert and with the same knife you used for the camembert, you cut into a hard cheese – the camembert cultures will be all over the hard cheese. The cultures will grow and a few days later the consumer might call up and complain that their cheese has gone mouldy. Of course, you can't know what the consumer has been doing with this cheese.*

Dairy producer

There was no mention of open life advice being informed by testing. Producers who provide open life advice do so on the assumption that products will be taken in and out of the fridge frequently by consumers, cross-contaminated with other products, left out for significant periods of time, and generally subjected to poor storage conditions.

## **4.7 Use of date marking in managing the food supply chain**

### **Additional uses of date marks**

Date marks are commonly used to support stock rotation in stores. They help retailers to measure availability and predict future demand. Date marks were also mentioned by some producers as having a logistical value: they are used in producers' traceability systems and in the setting of a limit on the time for which the producer is liable for the quality of that product. As one producer commented:

*As a producer, you cannot feel permanently responsible for the quality of your product.*

Bread producer

### **What happens after the displayed date has passed?**

Date marks are used in decisions about a product's fate as the end of the shelf life approaches. FBOs discussed a variety of practices that vary according to product category and date mark type. Retailers are usually responsible for the disposal of products at or near expiry, but in some instances the producers take back unsold product. For example:

- one bread producer mentioned taking back unsold product a few days before expiry because it did not want consumers buying a product that was not fresh. This producer would then sell the product on to be used as animal feed.
- one dairy producer said it takes back unsold milk daily so that the products available on the shelves were "as fresh as possible." It stated that this is common practice in its markets and that consumers have high expectations of how 'fresh' milk, above all other products, should be. This company tests the

returned products to ensure their quality has not been compromised and then uses them in the production of other milk-based products.

- several other producers discussed their practices of donating, selling on or reducing the price of stock as it approached expiry. Retailers usually had responsibility for disposal of expired foods but there were example of producers taking back and further utilising excess stock.

The practice of reducing a product's price as it approached expiry was mentioned by several retailers and NCAs. One retailer stated explicitly that it does not do this because:

*Our goal is to guarantee consumers the high quality of products. Also, shortening the period between when we take the product off the shelf and its expiration would have an impact of logistics, including product management. Additionally, if we shortened that period, we could not pass the products to foodbanks, as the law prohibits to do that. We would have consequently wasted more food.*

*Interview with retailer*

Another retailer stated that it keeps food on the shelves until the last possible date and does not respond to donation requests because donation of food that has passed its "best before" (or "use by") date is forbidden under local legislation.

Other practices mentioned were:

- donating products to be used in biogas production;
- donating leftover produce to zoos; and
- selling food that had passed its "best before" date to a social enterprise that markets these products to the general public.

Retailers and producers alike felt that the best way to prevent this type of waste was through improved planning and ordering systems.

There was some variation among countries in the treatment of products that were beyond their "best before" date. Some countries (such as Poland) do not allow food that is past its "best before" date to be placed on the market of food. National legislation in some other countries (such as Austria and Greece) states that products that have passed their "best before" date can still be sold or redistributed. In other cases (e.g., France), EU rules are considered sufficiently clear, and no additional provisions have been introduced.

Where sales of products that have past their "best before" date is allowed, national legislation may also specify that such products should be clearly marked and distinguished from other foods.

### **Other implementation issues**

Date marks are generally printed separately from the rest of the packaging. The way in which date marks are placed on the packaging depends on the equipment used by the producer. There are some common practices governing the location of the date mark for certain product groups. Many FBOs stated either that they follow these practices or that they place the date in the most obvious location. No interviewees mentioned specific problems with the legibility of the dates. Some noted that, where necessary, the date wording is placed in a different part of the pack from the actual date. This was not mentioned as a problem for consumer understanding; and when asked, producers stated that this layout was standard and something consumers were accustomed to (for example, the date being placed on the tie for bread products).

#### 4.8 Enforcement of date marking rules

The organisation of enforcement activities varies across Member States. In many cases, enforcement is responsibility of local inspectors who undertake random sampling and include date marking as part of these controls.

NCA generally reported that EU date marking rules are clear and thus they did not identify issues with enforcement. One NCA found that some inspectors issued sanctions when they had found food on the market that was passed its "best before" date – even though this was legally permissible – and stated that this was possibly due to some misunderstanding of EU rules. The NCA planned to advise inspection bodies that foods can be sold after the "best before" date as long as they are safe.

Another NCA described enforcement issues as follows:

*"The highest priority is that no one gets sick; sometimes you have a feeling that businesses want to be 150% sure that the label is correct. It is difficult for inspectors to challenge this – businesses know all the rules, they know the product and the production processes and inspectors have to challenge the business decisions."*

NCA

Some NCAs had specifically discussed the setting of date marks and what date marking is appropriate with FBOs. FBOs in Norway had collaborated with enforcement authorities to trial a non-standard wording for date marks. A producer in Sweden had trialled a new wording, although this was declared non-compliant by enforcement authorities:

*"[A retailer] tried last year to change the date labelling on their own yoghurt products. They wrote "lasts at least until" instead of "best before" to press on the fact that a product actually last at least until the set best before date. They challenged the National Food Administration a little around this labelling, but were not supported so now they have been forced to go back to the "best before" labelling. It was legal rules that forced them to stop with this "alternative" marking. The Swedish National Food Administration told them that you are not allowed to write like that because it is linked to the [FIC] Regulation."*

Data gathered during the mystery shopping exercise revealed some date marks or wording not to be in line with the requirements of the FIC Regulation. Interviews undertaken with the FBOs that produced these products found:

- one instance of where the producer did not seem to be aware of the FIC Regulation and believed their product (an unmarked bagged salad) to be exempt from any dating requirements (as it was unwashed and not a "convenience" product);
- one instance where the producer was aware of the FIC Regulation but believed the product (also an unmarked bagged salad) to be exempt as it was unwashed; and
- two instances of non-compliant products that were sold through wholesalers/importers, who seemed both unaware and unconcerned with the FIC Regulation.

#### 4.9 Barriers to, and facilitators of, better utilisation of date marking in relation to food waste prevention

Most NCAs and FBOs felt that EU date marking legislation was not a major issue. Their main concerns about the legislation related to:

- consumer misunderstanding of date marking;
- differences in FBOs' interpretations of EU rules; and

- barriers to donation of foods that were close to their “use by” or “best before” dates, or had passed the “best before” date.

Some countries have introduced national policies to address these issues, as summarised in the table below. NCAs have not systematically gathered information on the impacts of these policies (many rules had been operational for only a short period and interviewees believed it was too soon to draw conclusions about their impacts.) When given by interviewees, evidence of impacts was rather anecdotal and based on NCAs’ and FBOs’ self-assessment. Table 27 describes barriers to achieving the objectives of the date labelling legislation and how these barriers have been tackled.

Table 27. Overview of barriers to achieving the objectives of the date labelling legislation and how these barriers have been tackled

Perceived barriers	Initiatives to address them	Examples and impacts
Consumer understanding of date marking	Consumer education campaigns	NCAs and other organisations have developed communication and education materials to raise awareness of food waste and promote understanding food labels, including date markings (e.g., UK, Finland, Denmark, and Spain).
	Changes in the wording of date marking	Alternatives to the “best before” wording are being trialled by FBOs, such as: “best before, but not bad after” <sup>47</sup> , “Best before, and normally usable until” <sup>48</sup> , or “lasts at least until” (Sweden, Norway) <sup>49</sup> . These initiatives are at a trial stage, or were interrupted as labels were judged non-compliant with date marking legislation. No information is available on their impacts.
	Smart packaging	Food packaging with a colour indicator has been trialled by an FBO (Sweden, Norway). The indicator changes colour according to the state of the product.
FBOs’ interpretation of EU rules	NCAs’ and FBOs’ guidance on date marking	Guidance documents on date marking have been introduced in several countries under initiatives by NCAs and FBOs (e.g., UK and Denmark). Some NCAs have established platforms for dialogue with food stakeholders to discuss date marking rules (e.g., Czech Republic, Estonia, Finland, Germany, Lithuania, Luxembourg, the Netherlands and Norway). Other authorities provide more <i>ad hoc</i> support on FBOs’ request (e.g., UK).
Barriers to food donation	Guidance or legislation supporting food donation	Guidance on which foods can be donated and within what timeframes in relation to date marking exist in several Member States (Austria, Belgium, Finland Italy, Luxembourg and others). Lithuania has specific legislation that addresses these issues. Some countries have also introduced legislation that explicitly allows for donation past the “best before” date (Austria, Czech Republic, Greece).

Source: ICF

<sup>47</sup> ‘Best før, men ikke dårlig etter ....’ in Norwegian

<sup>48</sup> ‘Best før .... Normalt brukbar til....’ in Norwegian

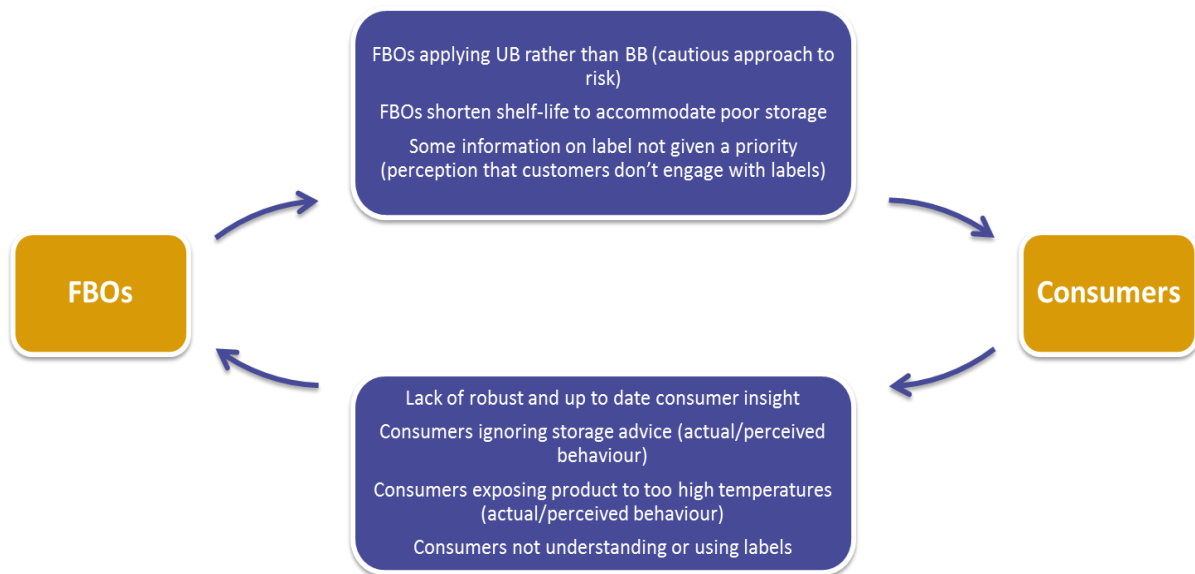
<sup>49</sup> The wordings reported in this report are the English translations of national wordings.

## Consumer understanding of date marking

### The nature of the problem

FBOs and NCAs shared the view that consumer misunderstanding of date marking may lead to edible food being thrown away. Interviewees suggested that consumers pay little attention to date marking information. Figure 7 illustrates the dynamics acting between FBOs and consumers that can lead to use of “use by” dates where they are not needed and to shorter product shelf lives. These dynamics have the potential to contribute to increased food waste.

Figure 7. Illustration of current relationship between consumer habits/ behaviour and FBO application of dates



Source: WRAP

Some interviewees believed that many consumers only look at the date on the label, without reading the wording. They also expressed a personal belief that consumers have become dependent on these dates and no longer use their own senses to determine whether products are fit for consumption.

In support of their comments, NCAs cited evidence from national and EU research into consumer understanding of labels, such as:

- Flash Eurobarometer 425 (this was mentioned several times, though not all NCA interviewees were aware of it). This found that just under half (47%) of Europeans understand the meaning of “best before” and somewhat fewer (40%) are aware of the meaning of “use by”. In both cases, a quarter or more think, incorrectly, that the meaning of date marking differs according to the type of food for which it is used.
- national studies on consumers and food waste (e.g., in Sweden, Finland, Denmark, Norway, Croatia, Estonia, Hungary, Latvia, the Netherlands and Lithuania), which showed different degrees of understanding of date markings among consumers. Examples of findings from these studies are provided in the box below.



### **Insights from national research into consumer understanding of date marks**

This box provides examples of findings from national research into consumer understanding of date marks and possible consequences on food waste generation, as explored by interviews with NCAs.

*Estonia:*

"The latest survey<sup>50</sup> on how consumers understand food labels was done in 2014. Results showed that people most frequently look for the ["best before"] – 78% look for it, followed by information on country of origin, list of ingredients and additives. [...]. The majority of respondents were aware of the meaning of the "best before" date (75%), while 23% of people think that the product is good until the "best before" date and then cannot be consumed at all, and 2% did not know anything. 55% know the meaning of "use by", 43% think that the product is good until the "use by" date but can be consumed later as well, and 2% did not know."

Finland (comment relates to Nordic Cooperation Council states):

*"[...] a study looking at why consumers throw away food can be found in the Norden report (p. 69)<sup>51</sup>. The main reason was mould, followed by the expiration of the "best before"/"use by" date. The big question is then how and to what extent you can minimise this. One third of food wasted was due to the expiration of the "best before" date."*

*Latvia:*

*"While the "use by" date is well understood among the Latvian population, the interviewee argued that consumers are often misled by the "best before" date. This has been verified in a 2016 study conducted by the Ministry of Agriculture<sup>52</sup>."*

In some countries, legislation that was in place before the FIC Regulation came into force may have contributed to consumer confusion. For example, Danish legislation established that foods past the "best before" date could not be sold. The Danish NCA therefore believed that consumers had to be educated on the changes introduced by EU date marking rules.

Some NCAs and FBOs mentioned issues arising from EU provisions which require a double date marking for eggs. For example, an NCA stated that:

*"...products have both a 'to be used by' and a 'to be sold by' date. This can be very confusing for consumers and they don't understand that some of the marking is just for the retailer."*

In a small number of cases, date wordings in different languages were identified as a possible cause of consumer misunderstandings.

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<sup>50</sup> The survey referred to is TNS Emor (2014), "Toidu märgistuse alase uuringu aruanne" [Food Label Survey Report]. An English-language executive summary is contained in slides 12–17 of a presentation available on the website of the Ministry of Rural Affairs of Estonia, available [here](#) (Accessed 5 December 2017).

<sup>51</sup> The study referred to is Silvennoinen, K. et al. (2012), MTT Agrifood Research Finland, "Food waste volume and composition in the Finnish supply chain: special focus on food service sector"

<sup>52</sup> The survey referred to is a 2016 survey by the Ministry of Agriculture which consulted 691 Latvian residents "to better understand the issue of date marking and how the citizens are using food products based on date marking". The results of that survey are available (in the Latvian language) [here](#) (Accessed 5 December 2017)

### Action taken to address the issue

Nearly all of the NCA interviewees mentioned consumer education initiatives as a useful tool for improving understanding of date markings, although only a minority had undertaken any. Many of these initiatives were developed in co-operation with other actors, such as FBOs and environmental NGOs. For example:

- dissemination of awareness-raising materials targeted at consumers, indicating that foods can still be eaten after the “best before” date, and explaining for how long these can be eaten. These initiatives also aimed at teaching consumers how to use their own senses and knowledge to understand when foods are still good to eat;
- organisation of events (such as exhibitions and fairs) to explain food labelling and date marking; and
- development of educational materials for schools to raise awareness about food waste.

Most authorities had not gathered data on the success of these initiatives, although they believed that they improved understanding. A Danish survey that measured consumer understanding before and after an information campaign on date marking had found an increase in understanding, but it not clear how far these improvements were a direct result of the campaign.

To improve understanding of “best before”, operators in Norway and Sweden trialled alternative date wording<sup>53</sup>, such as “best before, but not bad after”, “best before, and normally usable until”, or “lasts at least until”. Interviewees in Norway indicated that the use of “best before, but not bad after” on milk helped to improve consumer understanding. Other businesses were reluctant to change their labels, as this could mean having to change aspects of their production process and also mean additional costs. It should be noted that terminology for date marking is harmonised and explicitly laid down in the FIC Regulation.

Finally, FBOs had tested innovative ways of conveying information to consumers on remaining shelf life. For example, a Swedish FBO piloted a carbon dioxide indicator which changes colour according to the level of freshness of packed salads. A related initiative is being implemented in Norway, where the industry-led organisation leading on food waste reduction (Matvett) is working with a partner to promote the use of a technology that can communicate to consumers the durability of a product depending on the temperatures it has been stored in (so if the product has been stored in optimal conditions, the technology enables consumers to know how long it will last). The latter innovation is expected to have an impact on reducing waste, especially in the food-service sector.

### ***FBOs’ interpretation of the FIC Regulation***

#### *The nature of the problem*

Both producers and retailers discussed issues arising from different interpretations of EU rules. NCAs pointed to some product-specific issues which may impact on food waste levels. For example:

- the Croatian NCA often receives questions from FBOs (especially smaller ones) regarding how honey should be labelled. Many FBOs think that honey should be exempted from “best before” date marking. NCAs advised them that honey is not exempt and that FBOs are responsible for implementing EU rules; and

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<sup>53</sup> The FIC Regulation specifies the exact wording which should be used for “best before” and “use by” date (Table 14 in Section 3.3.3).

- an Estonian NCA reported that some quick-frozen products (such as meat) sometimes had a “use by” date mark applied. However, the NCA then went on to state that a “best before” date mark could be applied to such products because they are not highly perishable if stored at the right conditions and temperature.

#### Action taken to address the issue

NCA's have issued guidance to help FBO's setting the correct date marking and storage advice, such as guidance:

- on what the different date labels mean, and how best to decide which date to apply in relation to curtailing food waste (e.g., Denmark, Netherlands, Poland, Sweden and UK). Other countries planned to introduce similar guidance in the future (e.g., Croatia).
- which specifies the type of products that should bear a certain date marking (e.g., Finland).
- on running studies on the best conditions for product storage (this is an ongoing activity in Estonia).

In some cases, this was complemented by sector-specific guidance by FBO's, such as a software tool to predict the microbial stability of sweet fillings and therefore establish their durability<sup>54</sup>. This tool was developed by Belgian universities in cooperation with the confectionery industry and the Flemish region.

NCA's in the Czech Republic, Estonia, Finland, France, Germany, Lithuania, Luxembourg, the Netherlands, and Norway also established platforms for dialogue with food stakeholders (such as businesses, scientists and NGOs) on date marking and labelling. Other authorities provide more *ad hoc* guidance on date marking, based on requests for clarification by individual FBO's (e.g., UK).

Examples of dialogue between NCA's, food businesses and other food waste stakeholders are given in the box overleaf.

### **Barriers to food donation**

#### The nature of the problem

Interviewees discussed different barriers to food donation, including:

- FBO's' confusions about the conditions under which foods can be donated;
- donor FBO's' concerns over their own liability when donating foods;
- restrictive legislation, such as the prohibition on donating foods for human consumption past the “best before” date (this is the case, for example, in Poland and Hungary);
- cost to the donor of donation to the food bank or charity;
- tax reliefs that favour certain types of uses of edible foods (such as anaerobic digestion) over food donation;
- a lack of donation infrastructure in certain countries or regions; and
- difficulties in donating certain types of products – for example, some foodbanks receive too much bread or chilled products, which presents additional logistical challenges.

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<sup>54</sup> Vlaams Innovatienetwerk, “Project:more stable confectionery fillings while maintaining structure and taste” (online) (in Flemish). Available [here](#) (Accessed 13 December 2017)

### **Examples of dialogue between NCAs, food businesses and other food waste stakeholders**

This box provides examples of initiatives aimed at facilitating businesses' interpretation of EU date marking rules.

**Czech NCAs** meet around four times a year with trade associations (such as the Czech Food and Drink Federation) and food waste NGOs (such as Save Food) to discuss food waste issues and potential initiatives. They also provide funding to some of these NGOs.

**Estonian NCAs** also hold different meetings with retailers to explain date marking rules. These are mainly informative meetings: NCAs explain existing rules and give examples of correct application. They inform businesses of what issues have been found through inspections, and discuss cases of non-compliance. NCAs also present businesses with consumer complaints about goods that exceed the "use by" date being still available in store.

**France** set up working groups with food operators, associations, NGOs, and authorities as part of its national programme against food waste. One working group is dedicated to date labelling. Its aim is to reflect about the issue of understanding of dates, education, and evolution of EU legislation on food date labelling.

**United Kingdom** Food Standards Agency and the Waste and Resources Action Programme launched a consultation exercise in February 2017 for to update industry guidance on the application of on-pack date and related advice (storage and freezing guidance). This revised guidance took account of submissions from FBOs and other stakeholders and was published in November 2017<sup>55</sup>.

### Actions taken to address the issue

The Czech Republic has clearly stated in national legislation that distribution of foods past the "best before" date is allowed. There were, however, ethical concerns about donating "lower quality food to those in need".

Some authorities introduced guidelines for FBOs which indicate what foods can be donated. For example, in 2013 Finland issued a guideline which indicates some exceptions on use of products that have passed their "use by" date if further processed prior to their redistribution to the final beneficiary. The given conditions are very specific and restricted only to the specific context of foods donated for charity and which are further processed. Charity organisations that prepare food using fresh foodstuffs that have been donated can use products on the day after the "use by" date. The condition is that the sensorial quality of the product is evaluated and the products are heated to at least 70 °C during preparation. Based on positive feedback from FBOs and foodbanks, the Finnish NCA believed that these guidelines resulted in increased food donations.

Lithuanian authorities introduced national legislation which indicates which foods can be donated. For example, the legislation states that pre-packaged food can be donated after the "best before" date, but within certain recommended timeframes. Timeframes are defined by product category.

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<sup>55</sup> Waste and Resources Action Programme "Labelling guidance: Best practice on food date labelling and storage advice" (2017). Available [here](#) (Accessed 20 December 2017)

Italy introduced a law to limit food companies' liability for product they donate to charities. This law was aimed at addressing companies' and foodbanks' concerns over their responsibility for the safety of donated foods, which presented an obstacle to the development and growth of food redistribution infrastructures. The law enabled the creation of a redistribution programme involving food banks, retailers and the food service industry. Over the 10 years since the introduction of the law in 2003, this programme supported the recovery of a significant amount of foods to be donated, such as: 2.6 million portions of ready meals, 800.000 kilos of bread, and almost 900.000 kilos of fruit<sup>56</sup>.

In Germany, to address issues associated with logistics and infrastructure, FBOs and food banks established voluntary agreements on donation.

Some countries have introduced tax reliefs on foods distributed to charities in order to address issues associated with the costs of donation. For example, food donations in Hungary, Italy and Belgium are exempt from value added tax (VAT). These countries also provide further benefits to businesses: in Hungary, 20% of the value of donations can be deducted from the corporate tax base. In Italy, the cost of donated items can be deducted from the tax base, up to a value corresponding to 5% of business income.

#### 4.10 Stakeholder views on Annex X of the FIC Regulation

Several NCAs were in favour of further discussions on the list of foods exempt from "best before" labelling specified under Annex X of the FIC Regulation, but many were reluctant to see this happen and did not view it as a priority. There were concerns that consumers were used to the "best before" date on some longer life products and removing the date might have counterproductive effects. It was also felt that there were many products with long shelf lives, such as coffee, where quality would still deteriorate, and for that reason it would make sense to keep a date. However, the Dutch NCA was strongly in favour of extending the list of foods exempt from "best before" labelling and has carried out a risk assessment to determine criteria for selecting such foods based on product qualities and characteristics that could be used to select foods which could be added to Annex X.<sup>57</sup>

Among FBOs and European organisations, a similar range of opinions was expressed. A large number of the producers interviewed were unaware of the list or had no opinion on it, as their own products did not warrant exemption. Some believed that extensions and additional criteria should be considered, especially considering the ongoing advances in food processing technologies. Others believed that additional products should not be added, as such an extension would lead to inferior products being placed on the market. One producer, the bread producer quoted in Section 4.7, went so far as to say that all food products should display a date mark – in other words, that none should be exempt.

*You can lengthen the shelf life all you want but there should still be a date*

*Bread producer*

Across all stakeholder groups, there were suggestions of additional products or product categories that could be added to the list. Examples are:

- dried pasta;
- cheese wheels;

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<sup>56</sup> Banco Alimentar, "Good Samaritan Law: two million ready meals recovered in 10 years" (2013) (in Italian) (online). Available [here](#) (accessed 13 December 2017)

<sup>57</sup> Ministry of Economic Affairs of the Netherlands: "Options to extend the list of foods that are exempted from the requirement to bear a date mark" (2016) (online) – available [here](#) (accessed 20 December 2017)

- canned, sweetened condensed milk;
- some preserved meats that can be stored in ambient conditions;
- coffee;
- tea; and
- cheese in brine

For many of these products, it was suggested that including just a production date would be more helpful than “best before” labelling. There was concern among many stakeholders, however, that adding a type of date that consumers were not used to and is in the past rather than the future would only add to consumer confusion<sup>58</sup>.

Lastly, some NCAs suggested that producers were not making enough use of the existing provision in the FIC Regulation for longer life foods to be labelled with a “best before” date consisting of month and a year, or a year alone in the case of very long life products. They suggested that this might be because of consumer preference, traceability or simply long standing local market practices.

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<sup>58</sup> This is confirmed by an experiment conducted by the European Commission in 2015, which showed that including only the production date led to more food waste than either “best before” dates or no date at all (European Commission: “Milan BExpo 2015: A behavioural study on food choices and eating habits” (2015) – available on the website of DG Justice and Consumers of the European Commission at [http://ec.europa.eu/consumers/consumer\\_evidence/behavioural\\_research/docs/bexpo\\_milan\\_final\\_report\\_website\\_en.pdf](http://ec.europa.eu/consumers/consumer_evidence/behavioural_research/docs/bexpo_milan_final_report_website_en.pdf)). This same work found that products with a non-expired “best before” date were thrown away less than products with no date, but that after the date had passed, the situation reversed. This can be compared to work by Holthuysen *et al.*, which found that long shelf life products were thrown away less frequently (12% reduction) when the “best before” date was removed. Adding “Long Shelf Life” to the packaging on top of this further reduced food waste (31%), but it was also found that these results varied greatly depending on product type.



## **5 Conclusions**

### **5.1 Introduction**

This section presents conclusions from the project research. Following some introductory remarks on lessons drawn from the desk research, the main conclusions of the market research and stakeholder consultations are provided under the following headings:

- Choice of date mark type (“use by”, “best before”)
- Product shelf life/ setting of expiry date
- On-pack storage advice and open-life instructions
- Legibility and layout of date mark and on-pack information
- Enforcement of compliance with FIC Regulation and guidance
- Possible further exemptions to date marking under FIC Regulation Annex X.

The stakeholder consultations provide some explanation of the findings of the market research insofar as they shed light on the practices and perspectives of FBOs and NCAs. These conclusions inform the recommendations on how to prevent food waste through actions related to date labelling of foods that are provided in Section 6.

### **5.2 The existing evidence base**

The desk research component of the study reviewed research on industry use and consumer interpretation of date labels on food, and analysed data on the scale and distribution of food waste in the EU.

The over-arching conclusion from the data analysis is that any proposals to reduce food waste by driving improvements to labelling practices should focus on those food product types for which the consumer decision to discard is (already) likely to be informed by reading the on-pack label; and whose contributions to EU food waste is significant. Of food product types used in the market research, the greatest opportunities for prevention of food waste in relation to date marking exist for milk and yoghurts, fresh juices, chilled meat and fish. For other product types, the consumer decision to discard is more likely to be informed by visual cues that indicate a decline in product quality and palatability, such as fresh produce and bread.

The main findings from the review of existing research are that:

- date marking is frequently cited by consumers as a reason behind avoidable food waste;
- extending product life is possible and would reduce avoidable food waste;
- there is considerable variation in practices concerning date marking and other information provided on food labels, leading to a greater potential for avoidable food waste; and
- consumers have an imperfect understanding of date marks and other information displayed on food labels, and they need clearer and more easily comprehensible information if avoidable food waste is to be reduced.

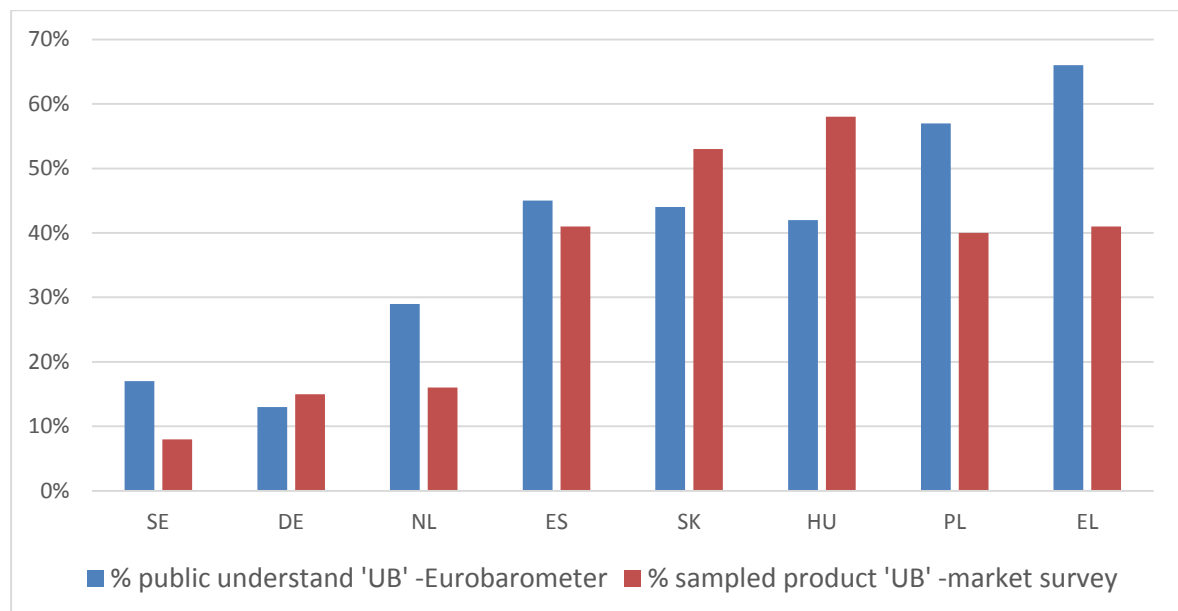
### **5.3 Choice of date mark type (“use by”, “best before”)**

The interviews suggest a high level of awareness among FBOs and NCAs of the FIC Regulation, its requirements, and its intent in distinguishing between “use by” date marks and “best before” date marks. This is consistent with the key finding from the market research that almost 96% of products sampled displayed a date mark and date wording that were in line with the requirements of the FIC Regulation.

Nonetheless, the market research found variation in date marking practices within product types and among Member States. Of the ten product types sampled for this study, only sauce, sliced bread, and fresh juice had predominantly the same type of date mark in all eight Member States surveyed. (Along with hard cheese, these were the product types for which more than 80% of products sampled displayed a “best before” date mark.) The other product types tend to display a “use by” date mark in some Member States but a “best before” date mark in others. Examples were even found of otherwise identical products manufactured by international brands displaying a “use by” date in one Member State and a “best before” date in another.

In general, “use by” date marks were less commonly found on products purchased in Sweden and Germany than on the same products purchased in other Member States. There is survey evidence<sup>59</sup> of particularly low levels of consumer understanding of “use by” date marks in these two countries (Figure 8).

Figure 8. % Public correctly understanding “use by” dates (Eurobarometer 425, 2015) compared with % of sampled product purchased for current study with “use by” dates applied, by Member State



Source: ICF based on Eurobarometer data and current study market research results.  
Note: 'UB' = “use by” date mark.

The stakeholder interviews provided insights into the causes of the differences among FBOs and among Member States in what type of date mark is regarded as appropriate for which type of product and why:

- a product type carrying “use by” in some markets will carry a “best before” date mark in others;
- “use by” date marks are being used on some products where there is no apparent food safety reason for doing so and thus where a “best before” date would be more appropriate; and
- there are examples of products listed in Annex X of the FIC Regulation having a date mark where none is required.

<sup>59</sup> Eurobarometer 425, 2015.



Some **producers** are taking account of factors beyond the product characteristics when determining how to apply the terms of the FIC Regulation. These include their perceptions of consumer knowledge of date labels. Some producers apply “use by” date marks to products (for which a “best before” date mark would be more appropriate) as a precautionary measure given the uncertainties about consumer handling food safely. This is also linked to:

- different perceptions as to which foods are ‘highly perishable’ in each market;
- retailer preferences for date marking practices, including examples of:
  - a preference for using “use by” dates for particular categories of product, such as all chilled products or all fresh produce; and
  - a preference to use “use by” dates to indicate freshness to the consumer.

**Retailers** tend to favour a consistent approach to date marking for each product type in each national market but are used to accommodating variation in labelling practice between national markets. The determination of the preferred type of label in each country is influenced by factors that include perceived expectations of consumers and, in some cases, guidance provided by a trade association or the relevant NCA.

Some **NCA**s provide interpretative guidance of date marks based on the FIC Regulation. There is variation among Member States in what this guidance entails. Most guidance cited by interviewees relates simply to interpreting the meaning of the date marks, but some guidance is more prescriptive, specifying which type of products should display what kind of date mark. There are also examples of NCAs working to harmonise practices across countries (e.g. among Nordic countries).

There is some evidence that “use by” and “best before” are used interchangeably to communicate product safety in some markets. Poor consumer knowledge was sometimes cited as a reason for applying a “use by” date, or for taking a cautious approach to date marking.

Lastly, date marks sometimes have other uses, such as helping with stock rotation or traceability. This may play a role in producers not taking advantage of the possibility offered in the FIC Regulation to mark longer life foods with just the month and the year, which in turn may contribute to consumers’ perceptions of the definitive nature of “best before” dates.

#### **5.4 Product shelf life/ setting of expiry date**

FBOs are responsible for determination of the shelf life of their products (with the notable exceptions of table eggs, which legislation specifies must be sold to the consumer within 21 days of laying, and poultry meat).

The remaining shelf life (as measured by the gap between the date of purchase and the “use by” or “best before” date on the product) of products purchased in the market research was assessed. None of the 10 product types showed a statistically significant difference between the remaining life of products carrying “use by” and those carrying “best before” date marks. This suggests that date marks were being used interchangeably as, since “best before” reflects food quality and “use by” reflects food safety, for a given product, the “best before” date should expire sooner than a “use by” date.

The interviews with FBOs and NCAs established that the declared shelf life is normally determined by safety and quality considerations (as informed by microbiological or sensory testing), and previous experience of a product or similar products<sup>60</sup>. For some FBOs the product life testing, and hence the determination of shelf life, also takes

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<sup>60</sup> The variation in the technical aspects that are used to set product life is well evidenced, e.g. Norden (2015).

account of the variations among countries in retailers' storage temperatures. For example, a manufacturer will give a product a shorter shelf life when selling it into the German market than when selling the same product into the Swedish market because German retailers' chill cabinets tend to be maintained at a higher temperature than those of their Swedish counterparts.

The interviews identified examples of retailers and suppliers working together to improve shelf life. Discussions about minimum shelf lives are part of this process. FBOs prioritise food safety as they would be expected to do – and tend to act cautiously to take account of differences in storage conditions (e.g. temperatures in the chilled food chain) and the 'worst case' scenarios for consumer or retail behaviour (e.g. chilled foods being stored in ambient conditions). This shows that greater harmonisation, with respect to setting shelf life for products of the same product type, might bring further benefits in terms of allowing FBOs to extend shelf life safely and reduce buffers, taking account of varying storage conditions.

Concern about consumer perceptions of products can prevent firms from exploiting the potential for extension of shelf life provided by improved storage technology. For example, advances in food processing technology mean that some products that have traditionally been sold as chilled products with short lives can now be safely stored at ambient temperatures (for example, fruit juice and certain cheeses). However, producers are influenced in the setting of product shelf life by public perceptions and may resist setting a longer product shelf life in such cases for fear of undermining a product's association with freshness and quality.

The interviews suggested that NCAs are generally not involved in providing technical guidance on product testing or setting shelf lives (though there are a few exceptions to this general rule). The main reason given by NCAs for not providing such guidance is that setting the date is the producers' responsibility (because only producers can fully understand product formulation and issues of food quality and food safety) and so the producers should continue to be accountable for the date setting choices that they make.

## **5.5 On-pack storage advice and open-life instructions**

The market survey found that:

- A wide range of storage advice was available for the sampled products, particularly in relation to the appropriate storage temperature for chilled products (which was expressed either as a maximum temperature or a temperature range). In Germany and Netherlands, this temperature-related storage advice was directly linked to the date wording.
- The storage temperatures quoted on products tended to be lower than the standard maximum retail temperatures mentioned by interviewees as the norm for the relevant market. The storage advice in the same product group was often found to vary or even be contradictory across different markets, potentially leading to consumer confusion.
- There was variation across the product types in the prevalence of advice on open life. Such advice was provided on the majority of fresh juice and pre-prepared chilled pasta products. It was least commonly found on yoghurt, tomato sauce, hard cheese and sliced bread.

Interviewees acknowledged the lack of consistency in storage advice and open life advice. There was no consensus on what constituted good quality, non-mandatory advice on open life for consumers.

The discussions suggested that FBOs' concern to avoid customer complaints and adjustments for factors such as consumer knowledge, and uncertainty about the

conditions in which the product might be stored, led them to use formulations such as 'consume immediately' as a precautionary measure.

FBOs and NCAs discussed various aspects of consumers' understanding of "use by", "best before" and storage / open life advice in particular. There were some calls for:

- clarification of the wording;
- more guidance from the Commission and national bodies;
- simplification of the advice provided to consumers (e.g. standardised colour coding or pictures to communicate, rather than words); and
- more innovative or technologically advanced ways of communicating whether a product is no longer safe to eat or close to the end of its life.

## **5.6 Legibility and layout of date mark and on-pack information**

Fieldworkers reported difficulty in reading date marks and/or the wording on 11% of the products sampled. The main problems were that the text was too small, the layout was unhelpful and the print quality was poor. For example, 20% of pre-prepared chilled pasta products had a date mark or associated wording that was unclear, as did 16% of sliced ham products and 13% of sliced bread (Section 3.3.5). No interviewees mentioned specific problems with making dates legible, despite the difficulties faced during the fieldwork.

The market research found that the date wording and date mark were alongside one another on some packaging and appeared separately on others. In the latter case, the FIC Regulation requires the date wording to state where the date mark is displayed on the packaging (e.g., "best before: see date on cap" rather than just "best before:"). FBOs explained this variation by reference to historic practices in each market that governed the location of the date mark for certain product groups. The separation of date wording and date marks generally occurs when the date mark is added on to pre-printed packaging during the latter stages of the production process (e.g. date stamps applied to bottle tops and on bread ties). FBOs did not see the separate location of date mark and date wording as a problem for consumer understanding; when asked, they stated that such layouts were standard and something that consumers were accustomed to.

## **5.7 Enforcement of compliance with FIC Regulation and guidance**

Most NCAs considered that the choice of date mark is the responsibility of FBOs and so not a matter for them to enforce. One NCA commented that enforcement of the FIC Regulation and action by NCAs was generally limited to ensuring that food that has passed its "use by" date is not sold to consumers (Section 4.8). However, some NCAs and other actors (e.g. trade associations) actively tried to shift date marking practices when these have the potential to increase food waste. Examples are:

- attempts to harmonise storage conditions across the chilled food chain;
- support for stakeholder or cross-industry dialogue;
- producing guidance to clarify the interpretation of "best before" or "use by"<sup>61</sup>;
- carrying out studies on what consumers would find helpful, or what they find difficult to understand in relation to date labelling;
- supporting FBO initiatives to propose additional date wording to clarify to consumers that "best before" is a quality mark and not a safety mark, e.g., 'best before but not bad after';

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<sup>61</sup> See, for example "WRAP Whole Chain Resource Efficiency Projects" (WRAP, 2015a)

- investing in smart packaging which can give a more accurate indication of durability for the end consumer; and
- removing legal barriers to food donation as they relate to date marking.

### **5.8 Donation of food past the "best before" date**

Interviews revealed a wide range of practices and legal frameworks governing the donation of food that has passed its "best before" date. Although allowed under EU rules, some Member States discourage or forbid this practice (e.g. Poland) while others encourage it (e.g. Italy). The local infrastructure for food distribution, including food banks and charity organisations, also influences FBOs' practices.

### **5.9 Possible further exemptions to date marking under FIC Regulation Annex X**

Annex X of the FIC Regulation lists food products that are not required to display a "best before" date mark. There was no consensus among those consulted as to whether adding further products to this list would be helpful in reducing food waste (based on evidence of consumer behaviour in relation to date marking). Consumer expectations relating to the presence of information and a date mark played a part in this feedback. This suggests that hesitancy about adding further products to the list is not misplaced, and any potential additions should be carefully considered.

### **Overall conclusions**

Based on the study's findings, the authors conclude that avoidable food waste linked to date marking is likely to be reduced where:

- a date mark is present, its meaning is clear and it is legible;
- consumers have a good understanding of date labelling (notably the distinction between "use by" – as an indicator of safety - and "best before" – as an indicator of quality);
- "use by" dates are used only where there is a safety-based rationale for doing so, consistent with the FIC Regulation;
- the product life stated on the packaging is consistent with the findings of safety and quality tests, and is not shortened unnecessarily by other considerations, such as product marketing;
- storage and open life guidance are consistent with the findings of safety and quality tests;
- there is a level of consistency in storage of food at retail and guidance for consumers regarding the temperatures at which products should be stored in the home.

## **6 Recommendations**

### **6.1 Introduction**

This section provides recommendations, based on the evidence gathered in the research conducted for this study, for future policy on date labelling, looking in particular at links to food waste.

### **6.2 Technical guidance and support for dialogue within the supply chain would help to steer FBOs towards best practice in date labelling**

A number of issues identified in the research could be addressed by producing technical guidance and by giving support to dialogue within the supply chain. Such guidance should be developed by a multi-stakeholder group and could be coordinated by the Commission through the EU Platform on Food Losses and Food Waste.

Issues to be considered are explained below.

#### **6.2.1 Determination of shelf life and guidance on storage and open life advice**

The research found uncertainty among FBOs as to how best to determine shelf life and guidance on storage. This could be addressed by technical guidance that takes into account food safety and technology considerations as well as best practice. Member State NCAs and scientific bodies, especially those who have developed best practice guidance, could be consulted to help manage this. Trade associations could also be consulted, especially since guidance is likely to be specific to food product categories. Important areas for guidance include the:

- assessment of possible risk to health (to inform decisions on the type of date mark to apply); and
- determination of product shelf life and open life taking account of safety and other factors.

Information on good/bad practices on presenting open life information should be made available. Where there are gaps, support for new research should be considered.

Any guidance in this area would need, as far as possible, to be 'future-proofed' to accommodate technical innovations in products (e.g. cases of products shifting from chilled to ambient identified in this research and vice versa) and packaging (e.g. smart packaging).

#### **6.2.2 Making a choice between "use by" and "best before" labels**

Marking food with a "use by" date when there are insufficient safety grounds for doing so increases the likelihood of that food being discarded when it is still safe to eat. The evidence that inappropriate date marking occurs comes from stakeholder interviews as well as the market research data. It would be beneficial to provide technical guidance on when a "best before" date mark could be used instead of a "use by" date mark without compromising product safety and consumer information. At present, local market conditions and inertia among FBOs may be limiting the potential for a consistent approach across Member States, as evidenced by conflicting information given on multilingual labels.

#### **6.2.3 Management of temperatures of chilled food in the retail supply chain**

Interviewees cited differences in management practices in the supply chain for chilled food among Member States that have an effect on producers' decisions about product shelf life. Guidance, or regulations, could be developed to address these inconsistencies in management practice. (The negative impact of the extra energy demand, if any, to store products at a lower temperature would be offset by the

beneficial impact of the reduction in food waste, owing to the large lifecycle impact of food production.)

### **6.3 FBOs should be encouraged to act to address the problem of illegible date marks as a priority**

Many of the products purchased for this study were not legible as a consequence of issues with print quality and ink retention, excessively small font size, and colours that could not be distinguished against the background packaging. There were also issues with layout, notably the separation of date type and date mark. These problems most commonly occurred when date marks were printed onto plastic film and plastic bottles. However, they may also occur when an "overlabel" is used (i.e., a label affixed to food packaging to display information in an additional language) but is damaged.

This is a matter that should be addressed by FBOs in partnership with retailers (who are in a position to monitor the degradation of print after it leaves the production facility and whose staff will have difficulty applying stock control policies if dates cannot easily be read), and checked by NCAs as part of their monitoring of compliance with the FIC Regulation.

Supplementary measures targeted at FBOs and the packaging sector that could help to address this problem are:

- an online resource that illustrates best practice for different packaging formats, considering layout, legibility and compliance with FIC requirements;
- consultation with the packaging sector/ trade bodies on minimum ink adherence/ chemical compatibility for printing onto glass, PET and HDPE, taking into account product life (e.g. requirements would be different for fresh milk compared with tomato ketchup).

### **6.4 Further steps could be taken to help empower consumers to make informed choices**

This study did not involve direct consumer research but evidence and perceptions of consumer awareness and behaviours figured prominently in the desk research and in the stakeholder consultations.

#### **6.4.1 Improving coherence and consistency of food information to consumers**

Desk research and stakeholder interviews suggest that there are a number of instances where inconsistent guidance from various sources, national laws and local practices may be leading to increased food waste in the home or at the point of sale.

This inconsistency is especially acute on multilingual packaging where contradictory storage advice, including maximum and minimum temperatures, open-life guidance, and even the date wording may appear in different languages – either all on the same label or on a main label and an "over-label".

Thus there appears to be a need for stakeholder dialogue or further European guidance on this topic in order to explore the potential for a consistent approach across Member States.

#### **6.4.2 Ensure that any new consumer education campaigns are informed by a synthesis of existing research evidence on consumer behaviour**

There is evidence that many consumers do not fully understand the distinction between "use by" and "best before" labels, and that this can contribute to edible food being discarded"; however, stakeholders were divided as to whether there would be merit in changing the terminology.

Many interviewees suggested that the Commission should support consumer education campaigns on food waste prevention. However, before responding to calls for supporting consumer campaigns, it is recommended that relevant existing research



evidence is collated and made available to inform the communication strategy. This evidence will include information on:

- consumers' actual usage and interpretation of date labels in the home and, if it exists, its related impact on food waste (the Norden reports<sup>62</sup> are a good example of this);
- case studies of campaigns and related evaluation data (if they exist) that have been run in Member States, including campaigns on how to interpret "best before" and instructions on open-life practices;
- the sources that consumers trust for advice on date labels and avoiding food waste, and how such information is disseminated (e.g. via retailers, food manufacturers, traditional media, social media, family networks, schools).

This synthesis could usefully be conducted at an EU level given the variable depth of evidence available in individual Member States.

### **6.4.3 Research on consumer engagement with date labels and associated guidance in the home would help to inform future policy**

The evidence base on how to inform consumers and influence behaviour so as to avoid unnecessary food waste through use of "best before" and "use by" dates, storage advice and open life advice is comparatively weak. Support for further research in this area would help to inform future policy, including by exploring options to increase the impact of communications via simplified messages (see box).

An expert workshop was convened by the research team to discuss the findings of the stakeholder consultations including how consumer research and innovation might reduce the amount of information consumers are expected to understand and process. Examples are:

- The potential for graphic symbols to be used to communicate important aspects of on-pack advice to consumers: e.g. on-pack freezing guidance, distinction between "best before" and "use by", open life. An example is the 'period-after-opening' symbol that is currently required by the European Cosmetics Directive on cosmetic products with a shelf life of less than 30 months.
- Evidence to inform future guidance and/or regulation on 'smart' packaging. Smart packaging can provide visual and tactile indications of information about date marks / wording, food safety risk levels, product life and storage guidance. It may also contain temperature indicators/ sensors and use temperature-sensitive inks.

## **6.5 Support efforts to extend product life**

### **6.5.1 Guidance highlighting measures that increase product life**

There is evidence that discussions about the Minimum Life On Receipt between producers and retailers have helped to improve product life and reduce food waste by providing an incentive for investing in new technologies, such as innovative packaging and "clean rooms".

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<sup>62</sup> Norden 2015, 2016.

NCA's and other stakeholders could highlight good practice or use guidance such as that developed by WRAP (2016d) to encourage FBOs to consider extension of product life as and where appropriate (as well as standard setting which can affect product life such as the example of more consistent storage temperatures).

## **6.6 Address barriers to safe redistribution of food**

This study did not investigate barriers to food redistribution in-depth but the research did suggest scope to clarify the legal position and improve consistency of practice with regard to the sale or redistribution of food that has passed its "best before" date. (This would need to be specific to food product categories.)

This recommendation could be considered within the scope of work commissioned by DG SANTE to support food redistribution in the EU.



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