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Author(s):	Ole Jørgen Hanssen and Hanne Møller
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Status and Trends 2009-13

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Authors: Ole Jørgen Hanssen and Hanne Møller

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Summary

This report summarises four years of data on food waste in Norway, which was obtained from producers, retailers, wholesalers and consumers. The data were collected using systematic uniform methods in order to ensure the best possible comparability over time. The ForMat project is unique in this respect, since there are no similar projects in other countries which analyse trends in the development of food waste over time. The project also demonstrated how consumer behaviour and attitudes regarding food waste change over time, and how this may help to reduce food waste in Norway.

The amount of food waste was studied for 21 product categories in cooperation with participating companies in the ForMat project. Data were obtained from various production units associated with each product category. For the years 2011-12, 8 companies contributed data, covering 5 of the 9 main groups included in the survey (fruit and vegetables, bakery products, prepared foods, fresh fish, dressings/dry goods), while 12 companies provided data for all four years. Data were also obtained from 29 shops, which was a representative sample of the sector in Norway. The amount of food waste is analysed as a percentage of revenue, both for all product categories sold and for the 21 product categories studied in particular. The 21 product categories analysed are not representative of the entire range of products in grocery outlets with regard to food waste, since several important groups with high sales and low waste are not included (soft drinks, beer, and non-food products such as tobacco and detergents). The estimates for food waste at the wholesale stage were based on records of all wastage that has occurred at a large number of wholesale warehouses in Norway. The data mostly relate to product categories distributed through wholesale companies in Norway, and only to a minor degree those distributed directly from producer to retail outlet.

For the consumer stage, the project included questionnaires 2-3 times per year, which were conducted with 1000 respondents as web panels by the leading Scandinavian data provider Norstat as part of its weekly data collection. In two rounds, 1000 consumers were asked whether they have thrown away food and/or leftovers during the past week from the 21 product categories in the study. If they stated that they had thrown away a product in one of seven specific groups, they were automatically routed to follow-up questions about the main reason why they discarded food from this group. There was also a separate questionnaire with a number of more general questions about food waste, unconnected to the analysis of specific product categories. These were concerned with consumer attitudes, behaviour and knowledge of food waste in Norway. The questions were based on shopping, cooking and eating habits, using standard response alternatives related to statements the respondents had to consider.

For producers, the results show a reduction in food waste relative to production from 4.8% to 4.0% between 2010 and 2013 for the selected product categories, which represents a decrease of about 16% in the period. Fresh bakery products show a steady decline in the amount of food waste during the period, and because this commodity constitutes a large proportion of the total production, this also affects the total figures. The same applies to fresh meat which also declined slightly during the period. Groups showing the greatest increase in food waste are fruit and vegetables and fresh fish and shellfish. For fruit and vegetables, the quality of the raw material is of great importance, and a year of lower quality may lead to rejection of a great deal of raw material and thus increased food waste. For fresh fish and shellfish, a change in the data basis is an important reason for the increase.

The results from retailers show that fresh bakery products and fresh prepared foods are the two product groups with the greatest waste as a percentage of revenue throughout the period as a whole, and freshly prepared foods have in fact risen to become the group with the highest percentage of waste in economic terms in 2011 and 2012 at 7.7%. Fresh bakery products showed a considerable increase in 2010, probably due to increased competition among suppliers, while the wastage decreased again to 2012, perhaps because of less competition. Fresh vegetables and fresh potatoes showed the greatest decreases in food waste as a percentage of revenue. Conversely, the waste from most fresh meat products, such as sausages, sliced meat, minced meat, pâtés, and also fresh fish and fish products, increased significantly from 2009 to 2012, while fresh meat and dairy products increased slightly overall during the period. For fresh eggs, the wastage declined slightly from 2009 to 2012. The total amount of food waste measured in tons is calculated by dividing the economic value of the waste by the CPI-adjusted price per kilo of the most important products in each group.

Overall, the results from the retailers show relatively little change in food waste as a percentage of revenue in all the product categories and for the shops with and without fresh food sections as a whole. However, there are clear trends for a number of categories over time when these are evaluated separately, and there are also some differences between the two types of shop:

- Reduction in the food wastage percentage for fresh vegetables, potatoes and dry goods
- Increase in the food wastage percentage for fresh prepared foods, sausages, minced meat, sliced meat and pâtés, fresh fish dishes and dairy products.

This indicates that food wastage has increased for the more expensive products, but decreased somewhat for products with a lower unit price.

At the wholesale stage, food wastage accounted for about 0.13% of revenue in the relevant product categories in 2012, and the figure has roughly halved since 2009.

The consumer survey reveals a clear pattern of a lower percentage who report having discarded a particular product category in 2013 than in 2010, with the greatest reduction in eggs (50%), followed by snacks, fresh meat, milk/cream, cheese and yoghurt/sour cream. The only product category which more respondents have thrown away in 2013 than in 2010 is fresh fish products. The changes must be regarded as significant for a number of product categories, with a reduction of 20% or more for as many as 10 categories. It is also interesting that eggs and yoghurt/sour cream have such a high percentage reduction, since these are products that have received special attention through the communication activities of the ForMat project. The results should be interpreted with caution, both because consumers often do not answer honestly or correctly in this type of survey, and because the reduction in food wastage may also be connected to reduced consumption in certain product categories. This will be explored further in the analyses of the research project Food Waste Prevention. Nevertheless, the pattern here is so unambiguous that the results clearly indicate a consumer response to an increased focus on throwing away food.

The reason most commonly given for discarding food was that it was “past its expiry date”, which shows that many consumers do not relate rationally to the date stamp. Firstly, the expiry date is by far the most important reason for disposing of yoghurt and sour cream, which are products marked with “best before” and which last well beyond the date stamped on them. Secondly, the expiry date is given as an important reason for both fresh bakery products and fresh fruit and vegetables, which are products without a date stamp in most cases. Poor storage of the product at home or during transport home was given as the

main reason in only about 10% of cases, which is closely linked to the fact that consumers themselves consider that they store the products correctly at home or when bringing them home. Discarding food because the product was unusable due to faulty packaging is reported as having quite minimal importance in all product categories, at only 1-3% of cases.

“Past the expiry date” has increased in importance as a cause of throwing away food during the period for all categories except bakery products, while there is a considerable reduction in the frequency of discarding food as a result of poor storage in the home or during transport home.

With regard to the behavioural characteristics of consumers that may affect food wastage, an important result is that 14% more people in 2013 than in 2009 state that they have reduced their wastage. A further positive feature is that in 2013 5% fewer say they throw out food just because it has expired, compared to 2009. Similarly, there are 5% more who state that they take smaller portions in order to waste less food. It is also encouraging that fewer report that it is acceptable to throw away food as long as it is composted or processed into biogas (3%). There are 28% fewer in 2013 who state that the food was unusable because of transport home from the shop, while 24% more say they take care to keep the food well chilled during transport home. There are also more people who report using a shopping list (8%), even though in 2010 there were already 60% who generally used a shopping list.

In 2011, the ForMat project took the initiative to establish network projects across value chains in three product groups, in order to analyse the reasons why food wastage takes place and to specify measures aimed at preventing it. The three groups were fresh meat, fresh ready-made meals (salads and pâtés) and dairy products. The networks consisted of representatives of retailers and producers, assisted by researchers from Ostfold Research and Nofima Food Research Institute. All networks helped to provide more detailed data on food wastage for selected products from producers and retailers, with a focus on individual products with a high percentage of wastage in relation to revenue. Two main lessons learned from this work were that forecasting needs to be improved through closer cooperation between client and supplier, and that the system of a threefold division of product life between producer, wholesaler and retailer in the common standard STAND 001 may be too rigid and should be reassessed. An important result of the network project is therefore that DLF (Grocery Producers of Norway) and DMF (the Norwegian Grocery Sector’s Environmental Forum) have jointly set up a working group under STAND to facilitate reduced food wastage throughout the value chain, for example by proposing a revised standard for fresh food management (<40 days total product life).

As part of Subproject III with network development, DLF, DMF and Ostfold Research have prepared a simple questionnaire where companies themselves can describe their own “here and now situation” with regard to food wastage, both in production and in shops. They have also developed a simple calculation tool to assist companies in assessing what food wastage currently costs them in terms of lost revenue and waste management expenses. To encourage companies to adopt the tool, called the “ForMat Check”, a separate website is also being developed under www.matsvinn.no together with a short video and PowerPoint presentation to explain its purpose and use.

In 2012, the ForMat project was requested to take responsibility for further progress in the work by establishing a food bank for the Greater Oslo Region. The ForMat project has led efforts to obtain funding for a follow-up project, and the Salvation Army, Blue Cross and Church City Mission have now established a cooperative (Matsentralen SA) to run the food bank, which was officially opened on 2

September 2013. It is estimated that the food bank will meet the food needs of about 3000 clients daily, which could reduce food wastage by up to 1,000 tons annually.

The results of the survey show few clear signs of reduction in the amount of food wasted over the four-year period covered by the report. At the production stage, the results indicate a reduction in total food wastage over the period of about 16%. The amount of food wastage from wholesalers remains at a low level and has little effect on the figures when the value chain is viewed as a whole. The retail stage also sees little change in total food wastage during the period, when all the retail outlets involved in reporting are considered. Overall wastage has remained stable at about 3.5% of revenue for the product groups throughout the period. With regard to the consumer stage, there are no studies to provide a basis for updating the data on the amount of wastage per capita in Norway or the total waste from households, i.e. detailed waste sample analyses. The results in this report are therefore based on figures representing what consumers themselves report about of changes in their food waste behaviour.

There is a basis for concluding that the message about the scope of food wastage and its associated problems has reached a sizeable majority of consumers, since 50% say they have become more aware of the problem during the past year, and almost 40% believe that they have reduced food wastage in their own households. In the period 2010-13, this group has increased by almost 15%, which is also very positive. While this in no way indicates that the amount of food wastage has been reduced by similar percentages, the results can clearly be interpreted as showing that the message from the ForMat project has been taken to heart by many consumers. The challenge is that the statistics show a rather uneven age distribution, as people over 40 years old are generally more likely to report having become more aware of the problem and having reduced their own food wastage. In the Norwegian general waste statistics, food wastage forms part of what is termed “wet organic waste”, where both food wastage and other waste from food production constitute an important share. Since the past and present proportions of food wastage in the total wet organic waste are unknown, the statistics cannot reveal changes in food wastage directly. However, it is a positive sign that the amount of wet organic waste per capita has decreased by roughly 5% from 2007 to 2011, from 117.5 kg to 112.4 kg, which may indicate that food wastage has also decreased over the past 5 years.

More and better data are needed for the ForMat project in the future. This applies to industry, where only a few companies are providing data at present and where medium-sized and small businesses should be better represented. It also applies to retailers and to households; in the latter case, the local councils collect and treat the waste and could therefore provide the key to useful data.

1 Introduction

ForMat is a collaborative project covering the entire value chain for the food and beverage sector in Norway, currently limited to foods that are marketed for and used in private households. The ForMat project is run by the company Matvett AS, and is led by a steering committee with representatives from the Food and Beverages and Food and Agriculture sections of the Confederation of Norwegian Enterprise (NHO), the Norwegian Grocery Sector's Environmental Forum (DMF), the Grocery Producers of Norway (DLF) and the Norwegian Packaging Association, while the Ministry of Agriculture and Food and the Ministry of the Environment participate as observers. These two ministries provide funding for the project together with the Ministry of Fisheries and Coastal Affairs and the Ministry of Children, Equality and Social Inclusion. The Ministry of Trade and Industry contributed a lump sum in 2011. In addition, Nofima and Ostfold Research provide the committee with expert advice on food safety, the environment and communications. The aim of the ForMat project is to help to reduce food wastage in Norway by 25% by the end of 2015, compared with 2010.

The project includes three sub-projects:

I. An annual study of food wastage
II. Communication and dissemination
III. Network projects on particular value chains or other food wastage issues

The ForMat project is also closely linked to the research project Food Waste Prevention, which is a collaborative effort between Ostfold Research, the National Institute for Consumer Research (SIFO) and Nofima, funded by the Food Programme of the Research Council of Norway with NOK 10 million over four years, ending in autumn 2013. The ForMat project is also a member of the partnership of users in the EU-funded FUSIONS project, where Ostfold Research is the research partner, playing a key role in the development of methodology for the mapping and documentation of food wastage in Europe.

This is the third report from the ForMat project and its topic is the results of surveys of food wastage in Norway from producers, wholesalers, retailers and consumers. The present report is based on the same methodology used in previous reports (Hanssen & Schakenda 2010, 2011), with a data basis for producers, wholesalers and retailers from 2011-12. The data for consumers was collected from web-based surveys in 2012 and 2013. The report also shows data and analysis of trends over a four-year period, in order to examine any changes in food wastage in the various links in the value chain.

2 Aims of the Project

The aim of Sub-project I in ForMat is to survey and gain knowledge of the amounts/values and composition of food wastage in Norway, focusing on the entire value chain, from production via distribution and sales to the consumer. Study will also be made of changes over time in consumer behaviour and attitudes to food wastage, and whether this can help to reduce food wastage in Norway. Further goals are to facilitate the monitoring of developments in food wastage over time and to enhance knowledge of the causes of food becoming waste at the various stages. By linking up with the research project Food Waste Prevention, data collected in the ForMat project will form the basis for more thorough and in-depth analysis, which will include a PhD at SIFO. In achieving these goals, Subproject I will help to realise the main goal of ForMat, namely the reduction of food wastage by 25% by the end of 2015.

3 Methodology and Data Basis

In order to determine status and trends in food wastage in Norway over a number of years, 9 product groups with 21 categories (subgroups) were selected as the basis for the study throughout the value chain. The rationale for the selection of and division into product groups and categories is described by Hanssen (2010), who also describes the methodology used in more detail.

The main approach chosen in the project was to quantify the composition and amount of food wastage from the production, wholesale and retail stages. For the consumer stage, the chosen approach was questionnaires asking respondents whether or not they have thrown away food from the 21 groups during the past week. The reason for this was that a quantified analysis would be too time-consuming and expensive in terms of the project framework, requiring waste sample analyses to study developments over time.

3.1 The Production Stage

Amounts of food wastage generated at the production stage for the 21 product categories were identified in cooperation with participating companies in the ForMat project. Data were obtained from a number of production units associated with each group. A total of 8 companies contributed data for 5 of the 9 main groups included in the survey (fruit and vegetables, bakery products, prepared foods, fresh fish and dressings/dry goods) for the years 2011-12, while 12 companies provided data for all four years.

In order to obtain a general idea of the annual amount of food wastage from a company, two main methods of calculating waste were used, depending on the quality of company records of how much food wastage occurs in the production process.

I. The company has complete knowledge of the amount of usable food discarded in the various stages of production (or combined), based on registration by scanning of packaged products discarded, weighing and recording of product weight, invoicing from companies receiving this type of waste for treatment, etc. Figures obtained in these ways can be used as a basis for reporting.
II. The company only has or can obtain an overview of the total amount of waste generated, in which case a qualified estimate can be made of how much of this is food wastage based on the criteria above, where the estimated proportion of food wastage is used as the basis for reporting.

The data provided by each company was used directly in the analysis, by calculating the percentage of waste in relation to the production volume. Weight was used as the basis, since not all companies were willing to reveal the value of their production; this has no significance as long as the production is relatively homogeneous in terms of product value.

In 2011, one of the networks in the ForMat project developed a new and improved method for performing studies in food manufacturing companies, which is available to companies to enable them to map their food wastage. Here, companies can gain access to methods which ensure that they all

collect data according to a common template, which states clearly what processes and types of food wastage are included, and which suggests indicators to be used in both reporting and improvement work. The report is available on the ForMat website (www.matavfall.no).

3.2 The Wholesale Stage

Estimates of food wastage at the wholesale stage have been made on the basis of records of all waste that has occurred at a large number of wholesalers in Norway. The data mainly applies to product categories distributed through wholesalers, and only to a minor extent those distributed directly from producer to retailer, which includes:

- Fresh bakery products
- Fresh unpackaged fish sold at a fish counter
- Liquid dairy products (milk and cream)
- Beer and soft drinks

For the first three groups included in the ForMat registration, the figures are therefore not complete throughout the value chain.

Registration was made for a total of 67 product categories in food and beverages, where there is no direct overlap between the classifications used in retail and in wholesale. It has therefore not been possible to identify all product categories at the wholesale stage using the same structure as in the retail stage. All food wastage recorded is based on the net value of the product and is calculated as a percentage of the revenue for the particular product category. The reason for discarding the product was also recorded, with an emphasis on two main categories:

- Not a saleable item because of too short a time to the expiry date
- Breakage due to the packaging or the product being damaged during handling or transport.

3.3 The Retail Stage

The survey of food wastage from retailers is based on information on everything registered as not sold from 30 shops in 2009/2010 and 29 shops in 2011/2012. The shops are a representative cross-section of retail grocery outlets in Norway, with regard to geographical region, urban or rural location, and shops with and without fresh food sections. The net value of registered products ending up as food wastage was recorded, and the sum of the net value of the wastage is calculated for the major groups in each of the 21 product categories. Sales figures for each shop are obtained, both the total for all product categories sold and for the 21 groups analysed. The product categories included in the food wastage study represent about 50% of total sales in the 30 (29) shops, which mean that the products involved cover the main areas of food wastage.

The amount of food wastage is analysed as a percentage of the revenue for all products sold and for the 21 particular product categories. The 21 groups analysed are not representative of the entire range of products in grocery outlets with regard to food wastage, since several large groups with high sales and a low level of wastage are not included, e.g. soft drinks, beer, and non-food products such as tobacco and detergents.

In order to analyse the trend from 2009 to 2012 in tons of food wastage, the figures are adjusted for changes in the consumer price index for the relevant product categories during the period.

3.4 The Consumers - Extent and Reasons of Discarding Food

The consumer survey consisted of questionnaires 2-3 times per year, conducted by Norstat in the form of web panels with 1,000 respondents, as part of their weekly data collection. This is a far more efficient way to obtain data than traditional phone interviews, but may lead to some bias in the sample, where those without access to computers and the Internet (especially the older age groups) are excluded. The sample has been tested with regard to the consumer characteristics data for each respondent, but significant deviations from the expected distribution in the sample were not found.

Each questionnaire asked 1000 consumers whether they have thrown away food and/or leftovers during the past week from the 21 product groups included in the sample. If they stated that they had discarded a product in one of seven groups, they were automatically routed to follow-up questions about the main reason why they threw away food from this group. There was also a separate questionnaire containing a number of more general questions about food wastage, unconnected to the analysis of specific product categories. These were about consumer attitudes, behaviour and knowledge of food wastage in Norway. The questions were based on shopping, cooking and eating habits, using standard response alternatives related to various statements the respondents had to consider.

The times when the various surveys were conducted are shown in Table 3-1. The weeks were selected to ensure that they would not include or be close to holidays, but be “normal weeks” as far as possible.

Table 3-1 Overview of times of surveys in 2010-13

Type of question	2010	2011	2012	2013	Total number of respondents
Wastage of specific product categories and reasons	Week 18 Week 34	Week 18 Week 34	Week 35	Week 15	6000
Consumer behaviour and attitudes to food wastage	Week 24	Week 24	Week 36	Week 16	4000

A copy of the questionnaire used in the consumer studies is available as an appendix to the 2010 report (Hanssen & Schakenda 2010). The questions were designed by Ostfold Research in cooperation with the steering committee and Annechen Bugge of SIFO.

4 Results

4.1 Producers

The data basis for food producers shows a certain amount of variation, partly because the companies included in the study vary from year to year and partly because different companies may have used different methods of measurement.

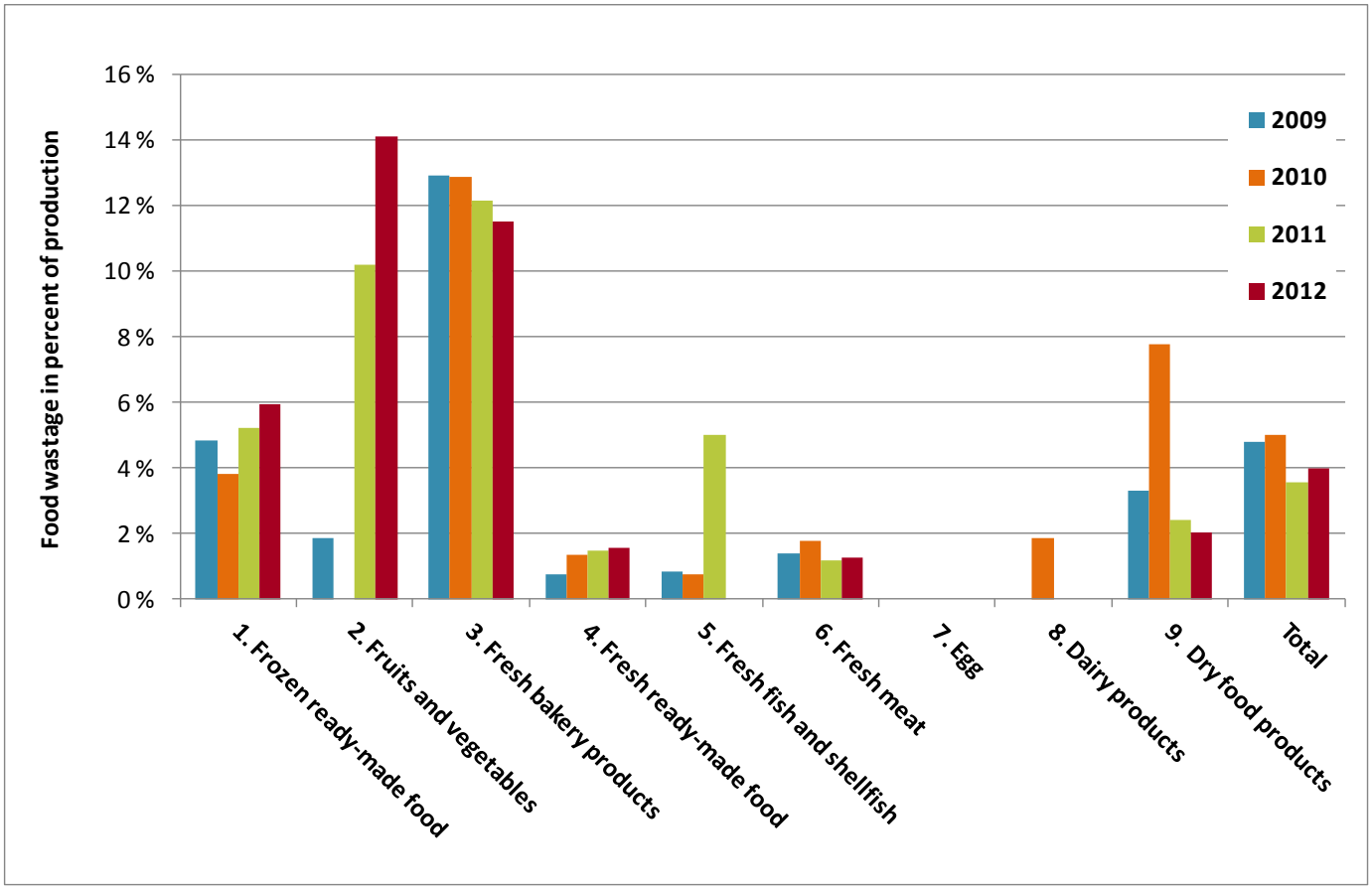

Figure 4-1 Food wastage as a percentage of production for 9 main groups of food products 2009-12

Figure 4-1 shows that total food wastage in the selected product groups fell from 4.8% to 4.0%, expressed as a percentage of production. This represents a decrease of approximately 16% in the period. Fresh bakery products show a steady decline in the amount of food wastage during the period, and because this commodity constitutes a high proportion of the total production, this also affects the total figures. The same applies to fresh meat which also declined slightly during the period. Groups showing the greatest increase in food wastage are fruits and vegetables and fresh fish and shellfish. For fruit and vegetables, the quality of the raw material is of great importance, and a year of lower quality may lead to a great deal of raw material being discarded and thus an increase in food wastage. Regarding fresh fish and shellfish, a change in the data basis is an important reason for the increase.

4.2 Retailers

Data on food wastage from grocery retailers was collected from the same shops over four years, but the number was reduced from 31 to 29 shops from 2010 to 2011 as a result of business changes. As seen in Figure 4-2, the proportion of food wastage as a percentage of revenue remained fairly stable at about 3.5% during the period, with a slight decline from 2009 to 2010/2011 but a rise again in 2012. From 2009 to 2011 there was some difference in the trend between shops with and without fresh food sections; the food wastage percentage increased in the former group and decreased in the latter. The percentage of food wastage in shops without fresh food sections rose from 2011 to 2012, so that both types of shops were at a similar level in 2012 with food wastage levels at about 3.5% of revenue (Figure 4-2).

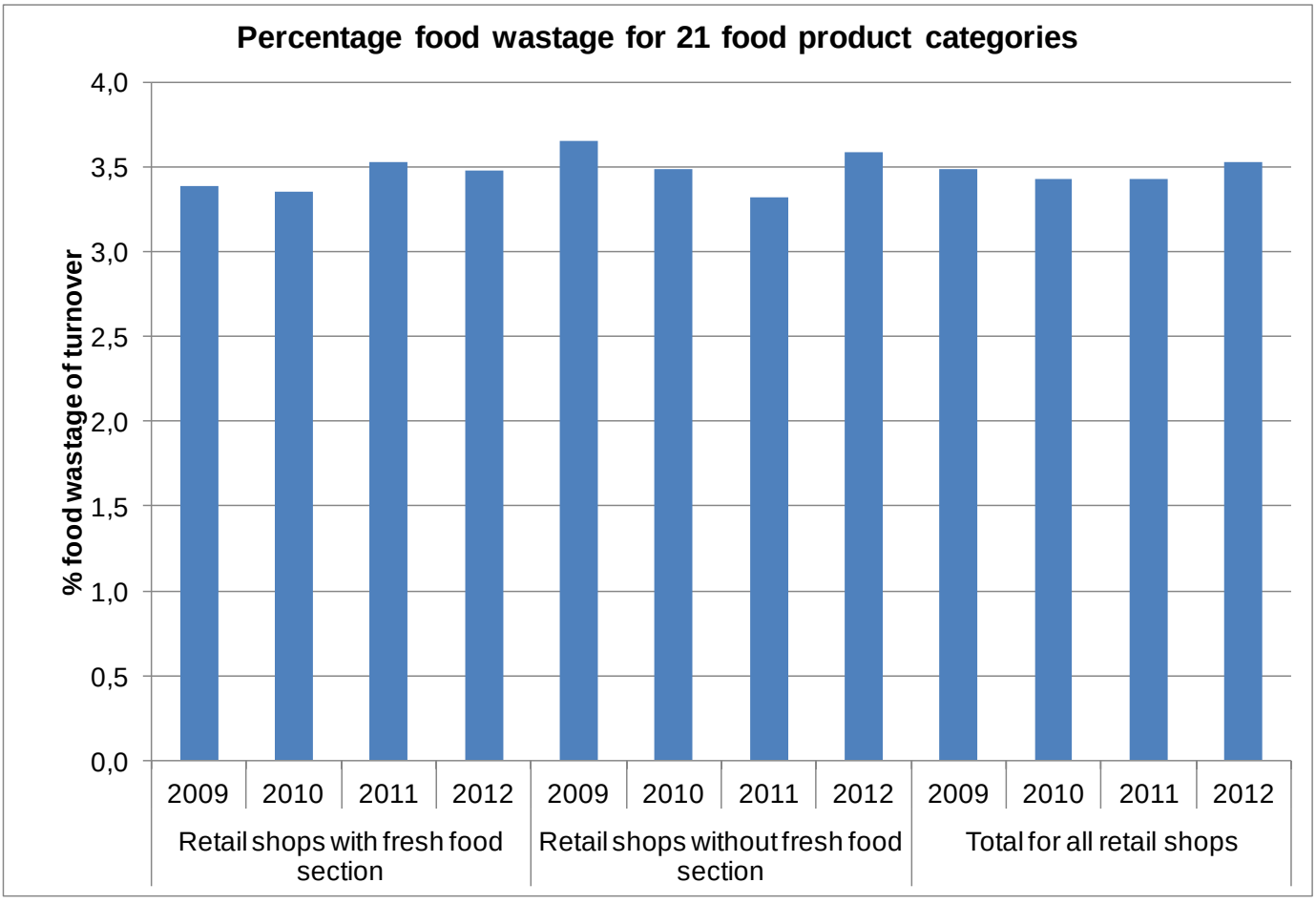

Figure 4-2 Food wastage from 30 grocery retailers 2009-2012

Figures 4-3 and 4-4 show the percentage of food wastage in the four-year period in all shops by product categories. Fresh bakery products and fresh prepared foods have had the highest wastage throughout the period as a whole, and it is especially noteworthy that fresh prepared foods has risen to become the category with the most wastage as a percentage of revenue in 2011 and 2012 at 7.7%. Fresh bakery products showed a considerable increase in wastage in 2010 due to increased competition among suppliers to the retailers (see Hanssen & Schakenda 2011), but has fallen back to a level of just over 6% in 2012. Fresh vegetables and fresh potatoes show the greatest decreases in food wastage, with reductions of 2.7 and 1.5 percentage points respectively from 2009 to 2012 (Figure 4-3). By contrast, sausages, fresh sliced meat and pâtés showed a considerable increase in wastage from 2009 to 2012.

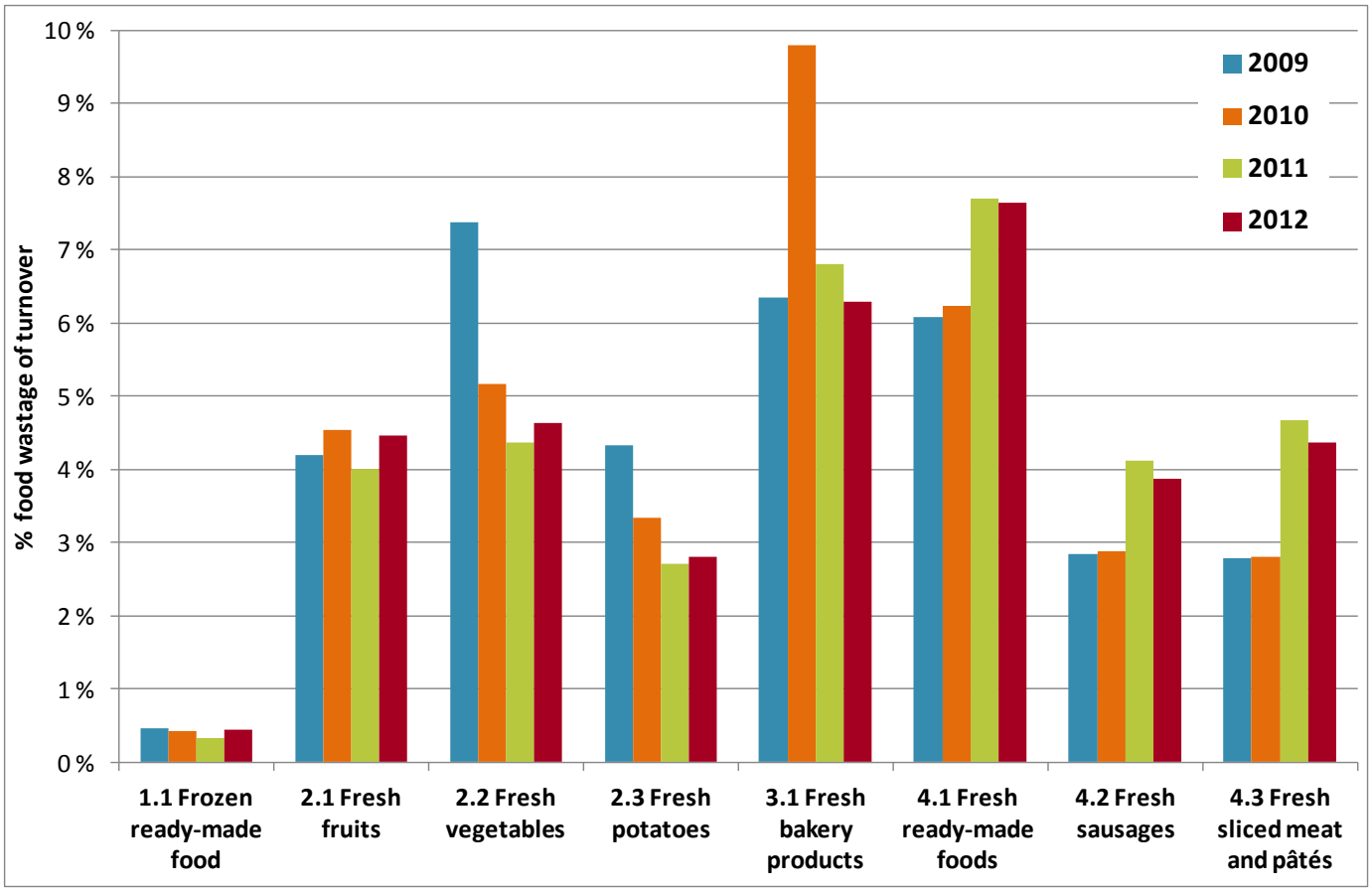

Figure 4-3 Percentage of food wastage in various product categories 2009-2012 measured in terms of economic value

Food wastage in the categories fresh fish and minced meat also increased significantly from 2009-2012, while dairy products showed a smaller increase (Figure 4-4). The percentage of wastage of fresh meat and dry food products increased strongly from 2009 to 2010, but has since decreased again back to the original level, and below it in the case of dry goods. Wastage for fresh eggs declined slightly from 2009 to 2012 (Figure 4-4).

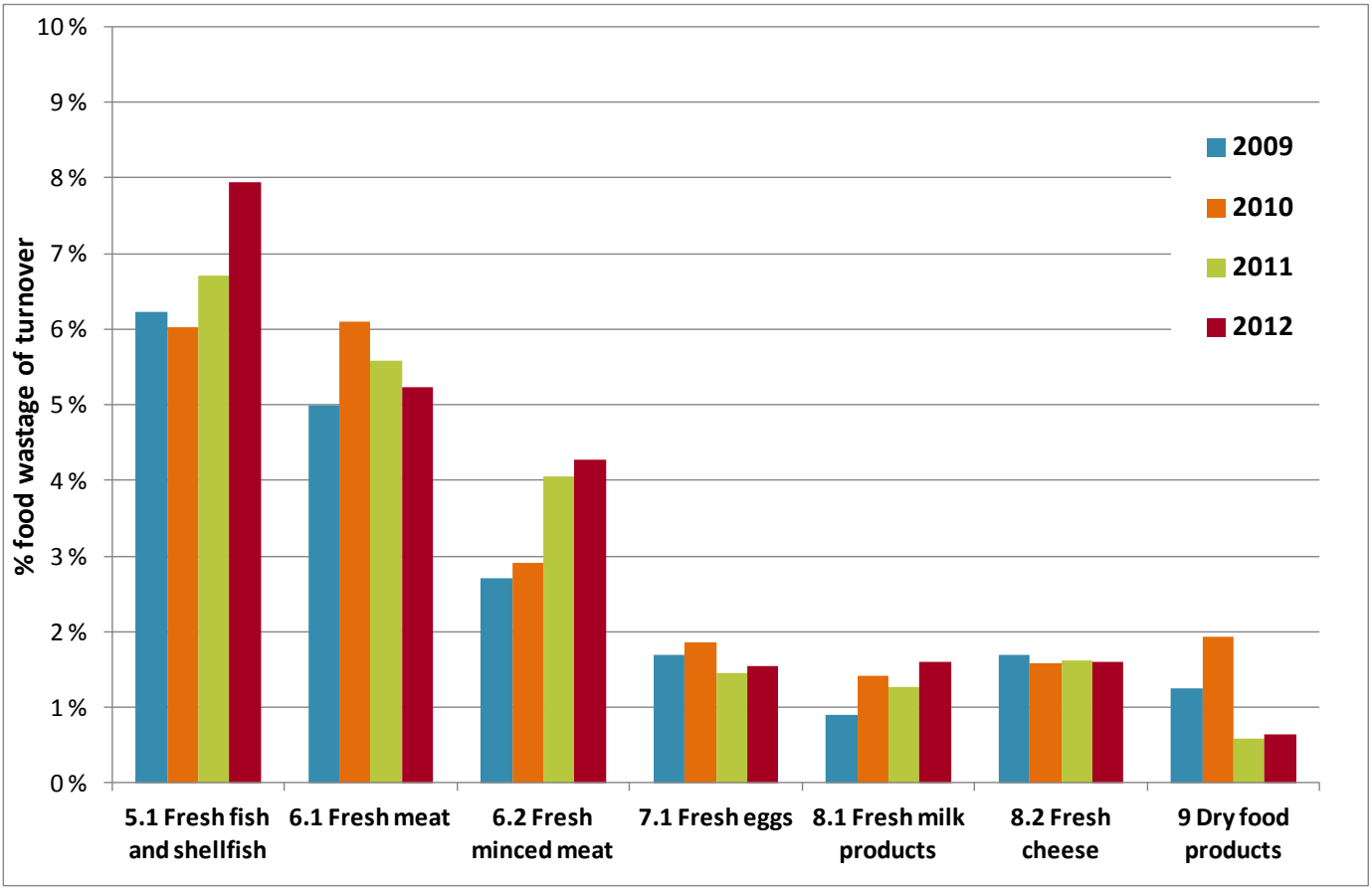

Figure 4-4 Percentage of food wastage in various product categories 2009-2012 measured in terms of economic value

The food wastage percentages shown in Figures 4-3 and 4-4 are based on the economic value of the wastage. Figure 4-5 shows the total amount of food wastage calculated by dividing the economic value of the wastage by the consumer price adjusted price per kilo of the product categories. The figure shows minor changes and partly somewhat contradictory results, compared to the results that changes in the wastage percentage would indicate. This may be due to changes in both the amount of wastage and the price per unit product, which may lead to the percentage of wastage remaining the same, while there is a change in the total amount of wastage measured in tons.

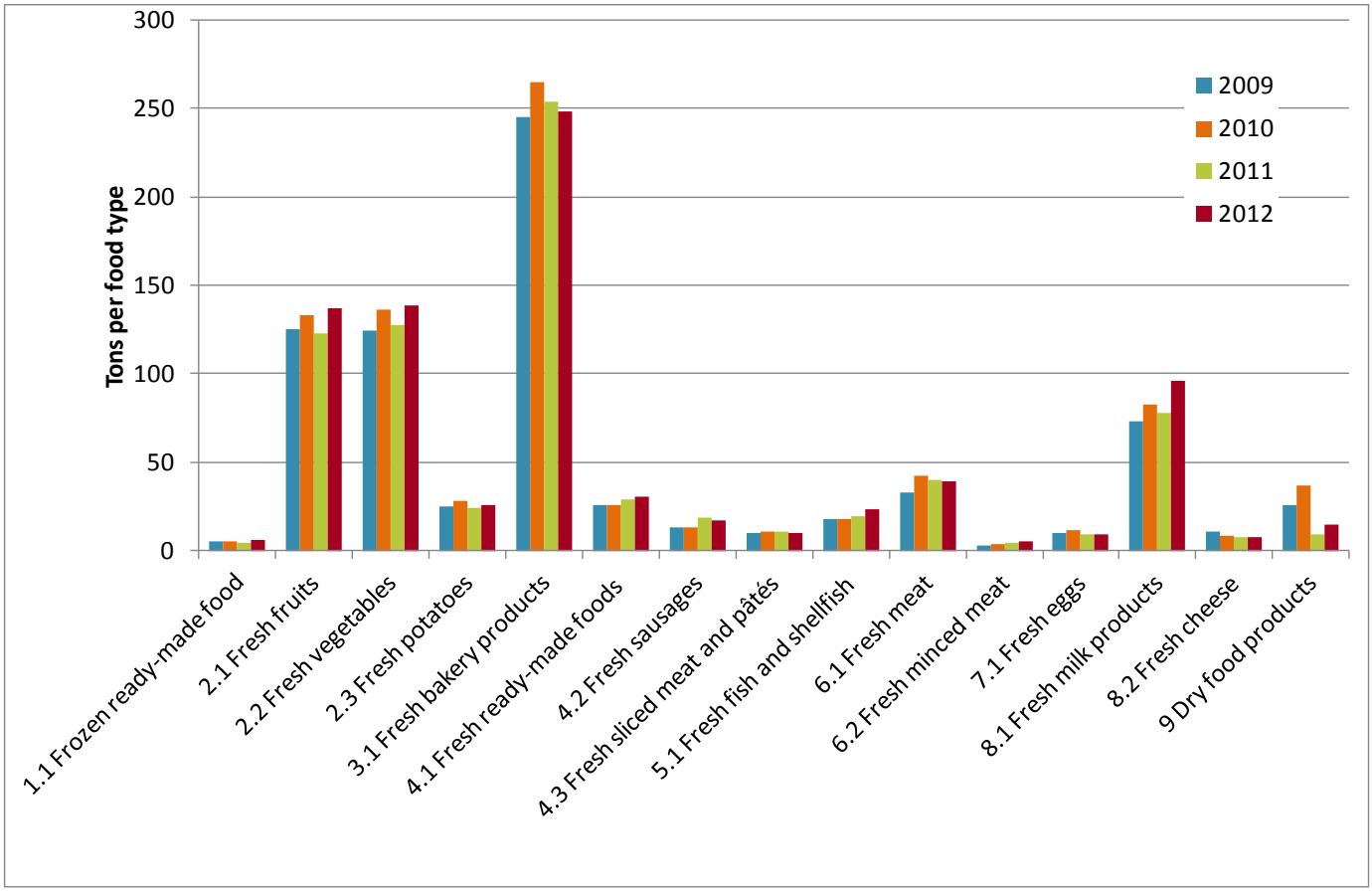

Figure 4-5 Total food wastage in tons from 30 grocery retailers 2009-2012 by product category

Figure 4-6 shows the total amount of food wastage, i.e. the total for the selected product categories shown in Figure 4-5. The figures for total food wastage in tons in the 29 shops indicate an increase in the period, but the reasons for the year-to-year fluctuations may be both an improvement in the data basis and a real increase in food wastage. In 2010, wastage was at high levels mainly because of greater wastage in fresh bakery products due to increased competition, but dry food products also peaked in 2010. The low level of wastage recorded in 2009 may be due to unreliable data in the first year of the survey.

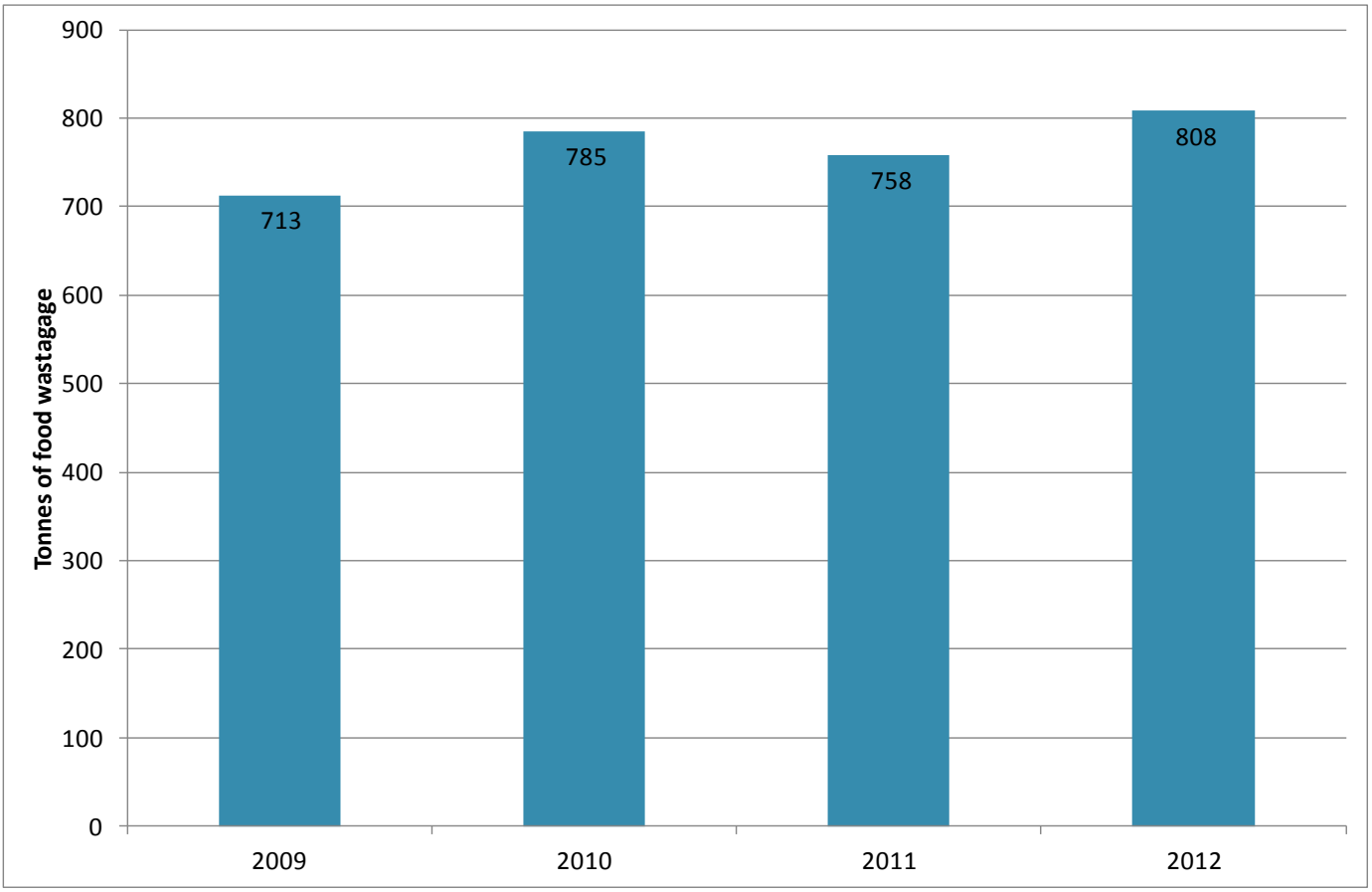

Figure 4-6 Total amount of food wastage in tons from 30 grocery retailers 2009-2012

Overall, the results from the retailers reveal relatively little change in food wastage as a percentage of revenue in all product categories and both types of shops as a whole. However, there are clear trends for several groups over time when these are evaluated separately, and there are also some differences between the two types of shop:

- Reduction in the food wastage percentage for fresh vegetables, potatoes and dry goods
- Increase in the food wastage percentage for fresh prepared foods, sausages, minced meat, sliced meat and pâtés, fresh fish dishes and dairy products.

This indicates that food wastage has increased for the more expensive products, but decreased somewhat for products with a lower unit price.

4.3 Wholesalers

Data from the wholesale stage in the value chain was obtained from a total of 13 regional and national wholesalers in Norway. Only wastage that consists of food thrown away is included in the analysis. As seen in Figure 4-7, the percentage of food wastage in relation to revenue is very low at the wholesale level, so although the volume of food products sold is considerable, the number of tons discarded is relatively low. For 2010 this was estimated at roughly 2,000 tons (Hanssen & Schakenda 2011). As pointed out in previous reports, only a very small proportion of fruit and vegetables, bakery products, fresh fish, meat and dairy products are today distributed by wholesalers, which means that the sales figures for these products are also very low. Overall the wastage was 0.13% of revenue in the relevant product groups in 2012, and has roughly halved since 2009.

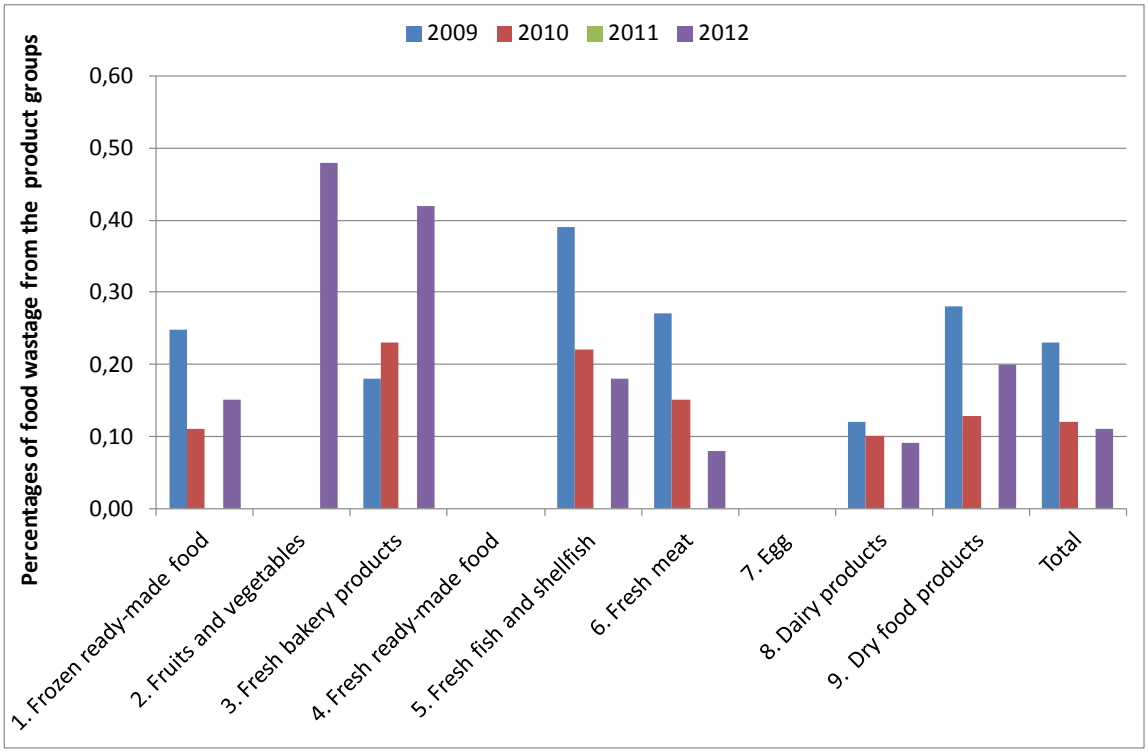

Figure 4-7 Percentages of food wastage from the main product groups at the wholesale stage 2009-2012. Data for fresh prepared foods and fresh meat have been combined.

4.4 Consumers

The data on consumers is based on questionnaires with 1,000 respondents in each survey (see Section 3.4).

4.4.1 Frequency of Discarding Food in Different Product Categories

The annual results for the numbers of people who report having thrown away food from various categories in the past week appear in Appendix 1 (Figures 7-1 to 7-5) for each product category. It

can be difficult to see any clear trends in these figures. To indicate overall changes over time, Figure 4-8 therefore shows changes in the frequency of discarding food from 2010 to 2013 for each product category. The figure reveals a clear pattern of a lower percentage who report having thrown away food in a particular product category in 2013 than in 2010, with the greatest reduction in eggs (50%), followed by snacks, fresh meat, milk/cream, cheese and yoghurt/sour cream. The only product category which more respondents report discarding in 2013 than in 2010 is fresh fish products (Figure 4-8). The changes must be regarded as significant for a number of product categories, with a 20% reduction or more in as many as 10 categories. It is also interesting that eggs and yoghurt/sour cream have had such a high percentage reduction, since these are categories that have received special attention through the communication activities of the ForMat project. The results should be interpreted with caution, both because consumers often do not answer honestly or correctly in this type of survey, and because the reduction in food wastage may also be associated with reduced consumption of certain products. This will be explored further in the analyses of the research project Food Waste Prevention. Nevertheless, the pattern here is so unambiguous that the results clearly indicate a consumer response to an increased focus on throwing away food (see also Section 4.4.3).

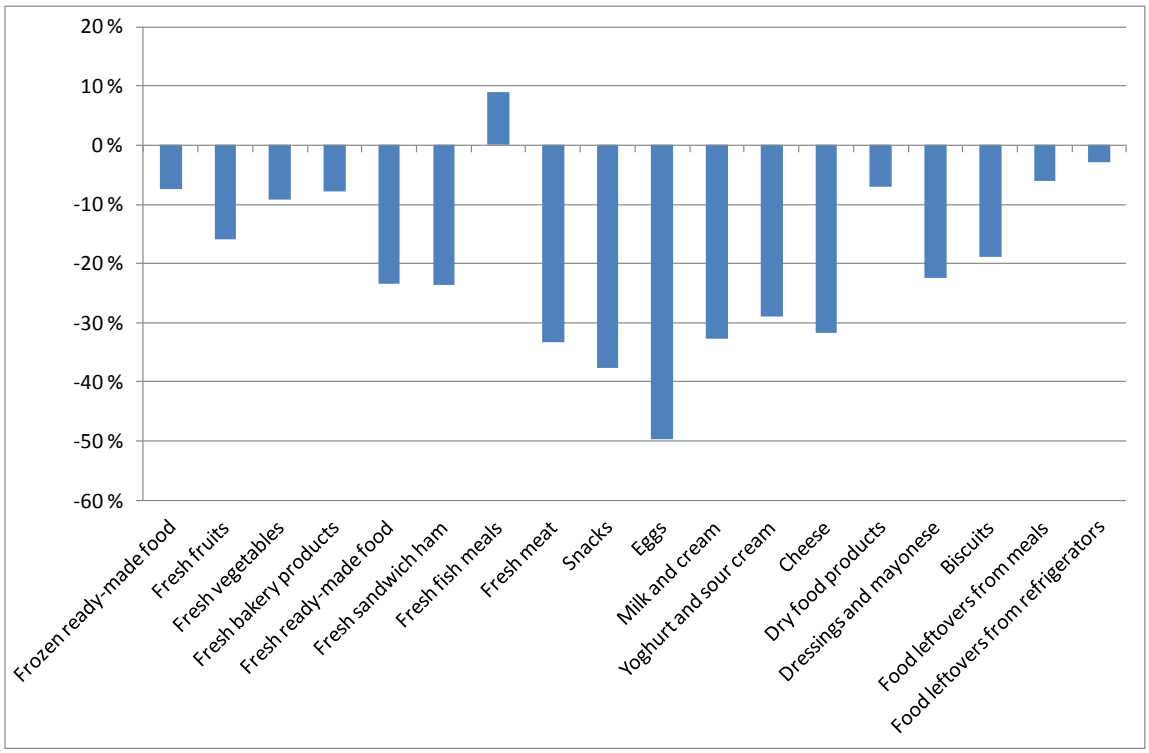

Figure 4-8 Percentage change in frequency of discarding food by various categories 2010-2013

Appendix 1 examines in detail the responses to the questionnaires over four years for each of the 21 product categories, based on the consumers' own statements about whether they had thrown away food in a particular category in the week before the survey. It is important to note that the figures do not provide information about the volume, weight or value of the discarded food; they only provide a basis for studying changes in the frequency of food wastage in the various product categories. A further general point to note is that the findings may express a relative change in the pattern of consumer food wastage, but they should also be analysed in relation to changes in sales of the various product categories.

4.4.2 Reasons for Discarding Food in Different Product Categories

For those product categories where respondents reported having thrown away food in the previous week, they were also asked to indicate the main reason why the product was thrown away. In each case, only one reason could be given. The results collected over the entire period for five main groups are shown in Figures 4-9 and 4-10 below.

The reason most commonly given for throwing away food was that it was “past its expiry date”, which shows that many consumers do not relate rationally to the date stamp. Firstly, the expiry date is by far the most important reason for disposing of yoghurt and sour cream, which are products marked with “best before” and which last well beyond the date stamped on them. Secondly, the expiry date is given as an important reason for both fresh bakery products and fresh fruit and vegetables, which are products without a date stamp in most cases. The results reveal not only the effects of poor planning and shopping routines but also a narrow focusing on the date stamp in determining whether a product can be eaten or not (Figure 4-9). For most groups, bad taste, bad smell and damage to parts of the product were the second most important reasons for throwing away food, and these are genuine reasons. Fresh fruit and vegetables stood out in particular as a product where parts were often damaged, while for fresh fish the second most important reason was that there was too much of the product in the packaging. Poor storage of the product in the home or during transport home was given as the main reason in only about 10% of cases, which is closely connected to the fact that consumers perceive that they store the products correctly at home or when bringing them home (see Section 4.4.3). Discarding food because the product was unusable due to faulty packaging is reported as having quite minimal significance in all product categories, at only 1-3% of cases (Figure 4-9).

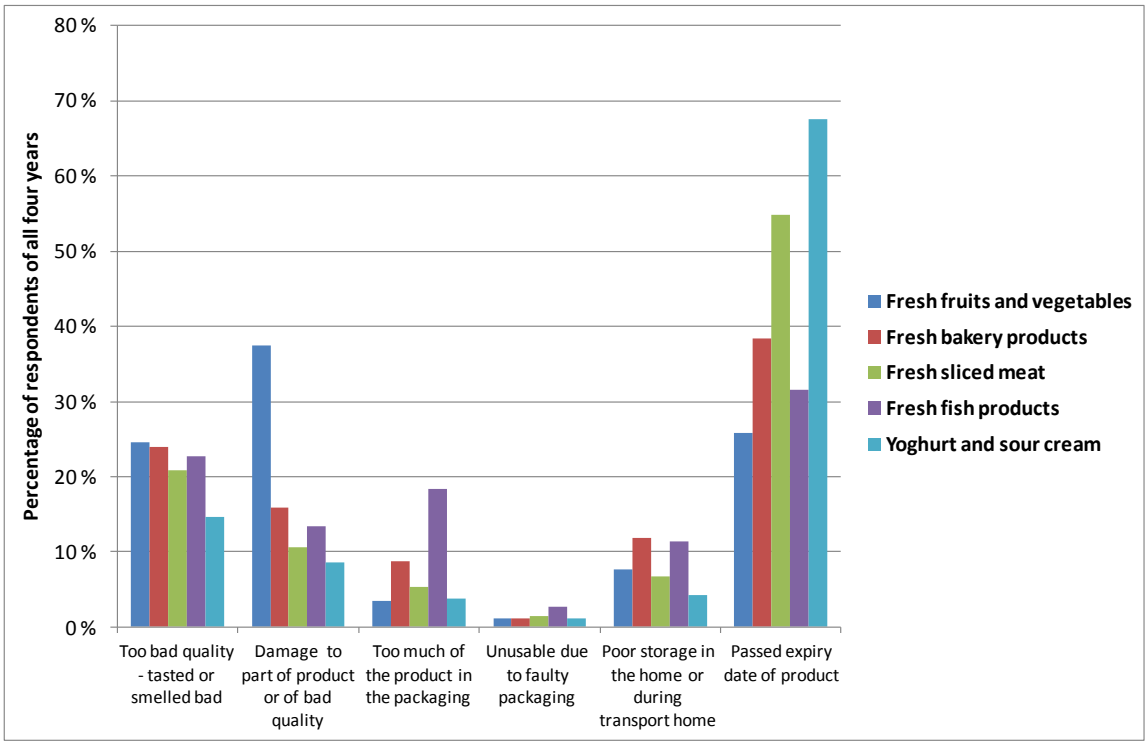

Figure 4-9 Frequency of main reason for discarding food in different product groups - average for the period 2010-2013

Changes in the frequency of the main reason between 2010 and 2013 are shown in Figure 4-10. An interesting feature is that “past the expiry date” has actually increased in importance during the period for all categories except bakery products. Discarding food due to damaged packaging has fallen considerably, from an initial very low level, and in 2013 is only given as a reason for discarding fresh bakery products and yoghurt/sour cream, but to a very limited extent. Poor storage at home or during transport home has also declined strongly, especially for sliced meat, which is linked to the fact that many consumers believe they have become better at storing products correctly (see Figure 7-14).

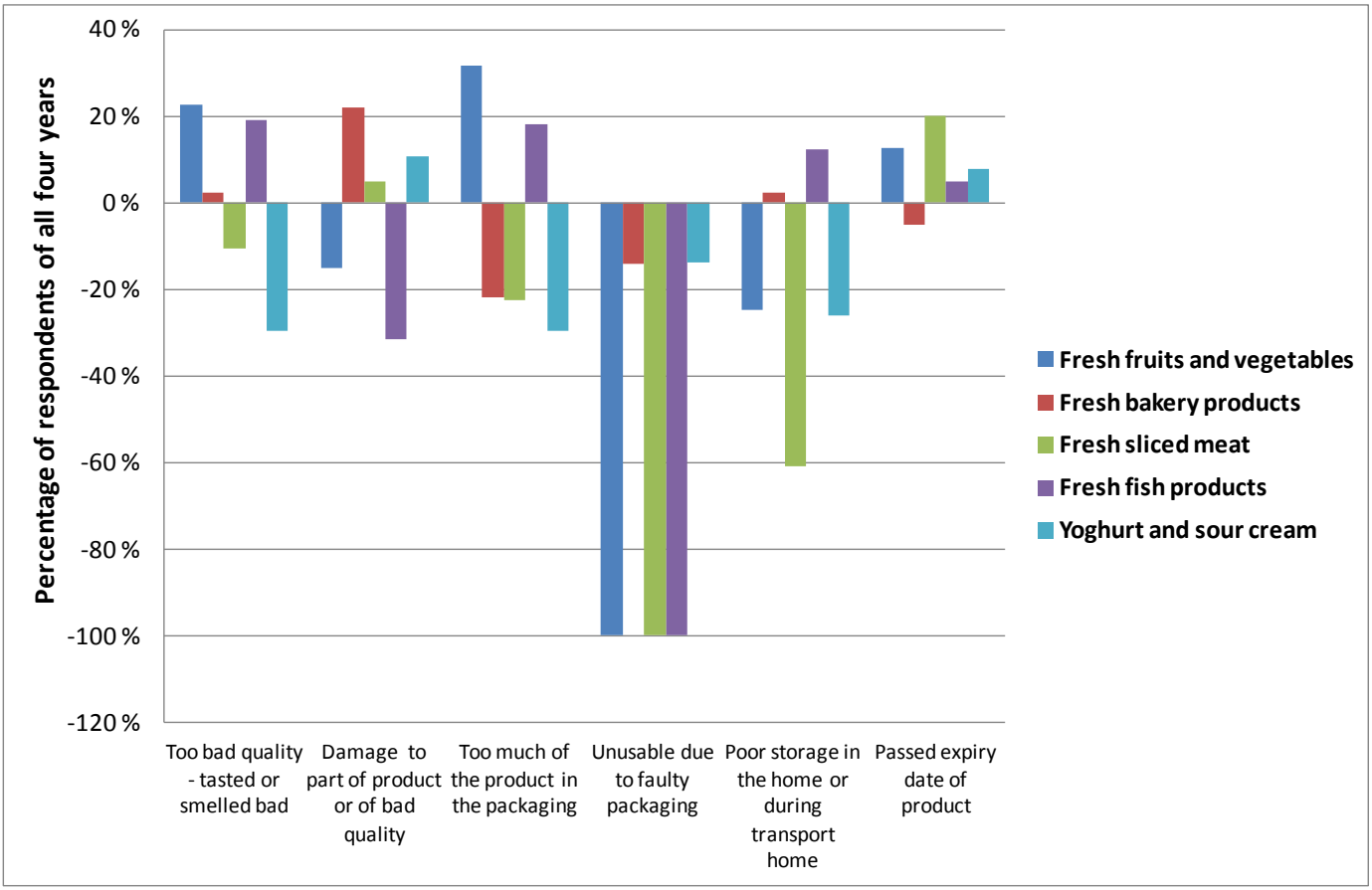

Figure 4-10 Frequency of main reason for discarding food in different product groups - percentage change between 2010 and 2013

4.4.3 Attitudes and Behaviour Related to Discarding Food

As is the case with the actual discarding of food, there is also a great deal of data for the analysis of possible changes in consumers’ attitudes and behaviour related to the discarding.

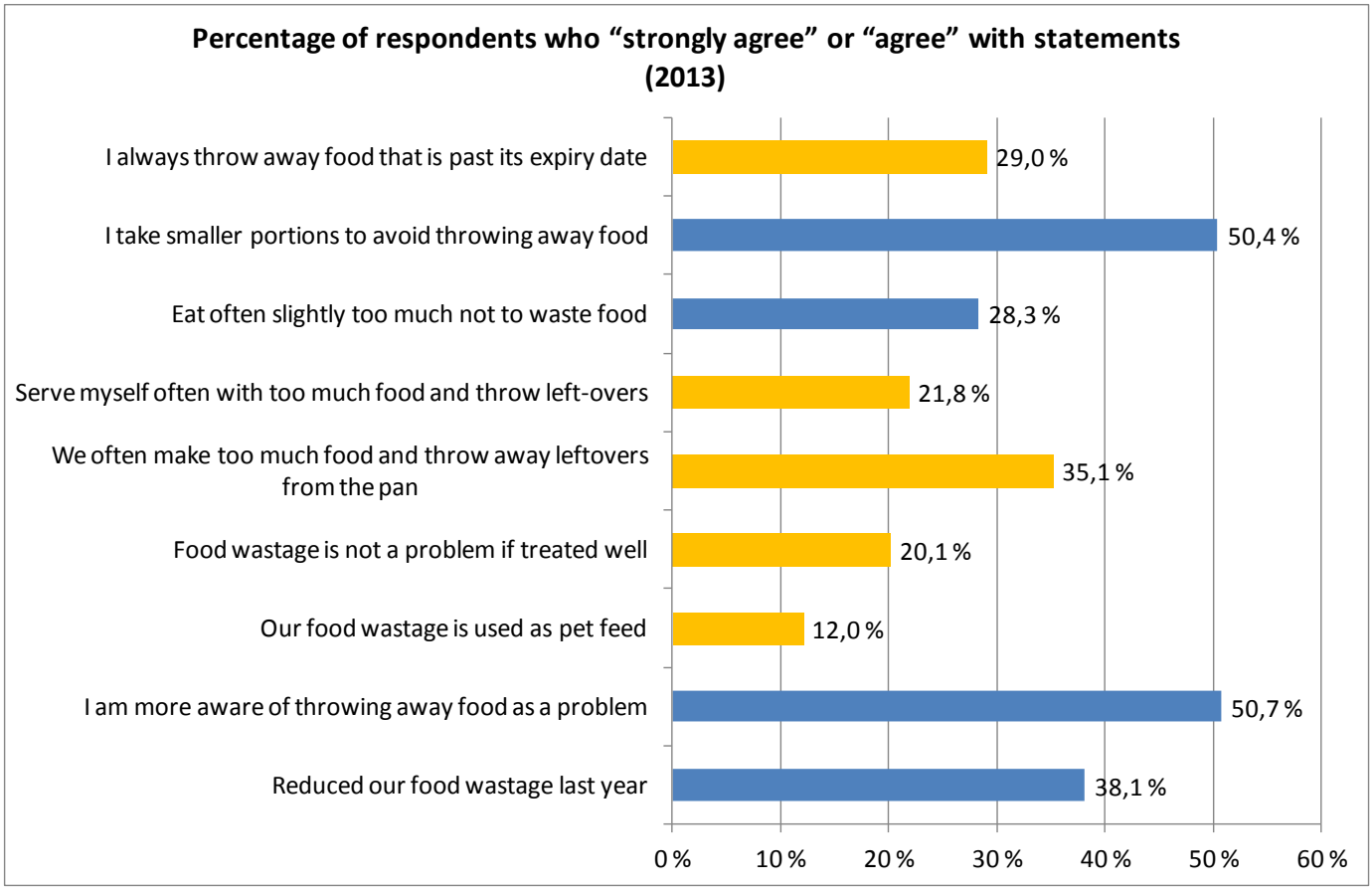

Figure 4-11 Percentages responding "strongly agree/agree" to statements about behaviour related to discarding food in 2013 (blue bars can lead to reduced food wastage; yellow bars can lead to increased food wastage)

Figure 4-11 shows the percentage of respondents who "strongly agree" or "agree" with statements about food wastage behaviour in 2013. With regard to statements that can lead to reduced food wastage, about half agreed with the statement "I take smaller portions to avoid throwing away food" and "I am more aware of throwing away food as a problem." As for the statements that may increase food wastage, about every third person agrees with "We often make too much food and throw away leftovers from the pan" and "I always throw away food that is past its expiry date".

Figure 4-12 shows the percentage change from 2010 to 2013 for some behavioural characteristics of consumers that may be important in the context of food wastage. The major finding here is that 14% more people say they throw away less food in 2013 compared with 2009. It is also very encouraging that 5% fewer say they throw away food just because it has expired in 2013 than in 2009. Similarly, 5% more state that they take smaller portions to avoid throwing away food. A further positive feature is that fewer say it is acceptable to throw away food as long as it composted or made into biogas (3%). With regard to the question of overweight, it is also positive that 5% fewer say they eat a little too much food to avoid throwing away food, not least in the light of the fact that some people take smaller portions. The fact that 4% fewer report being aware of throwing away food as a problem in 2013 may be interpreted both positively and negatively; positively because it may mean that they were already aware of it, and negatively because the information campaign may have reached fewer people.

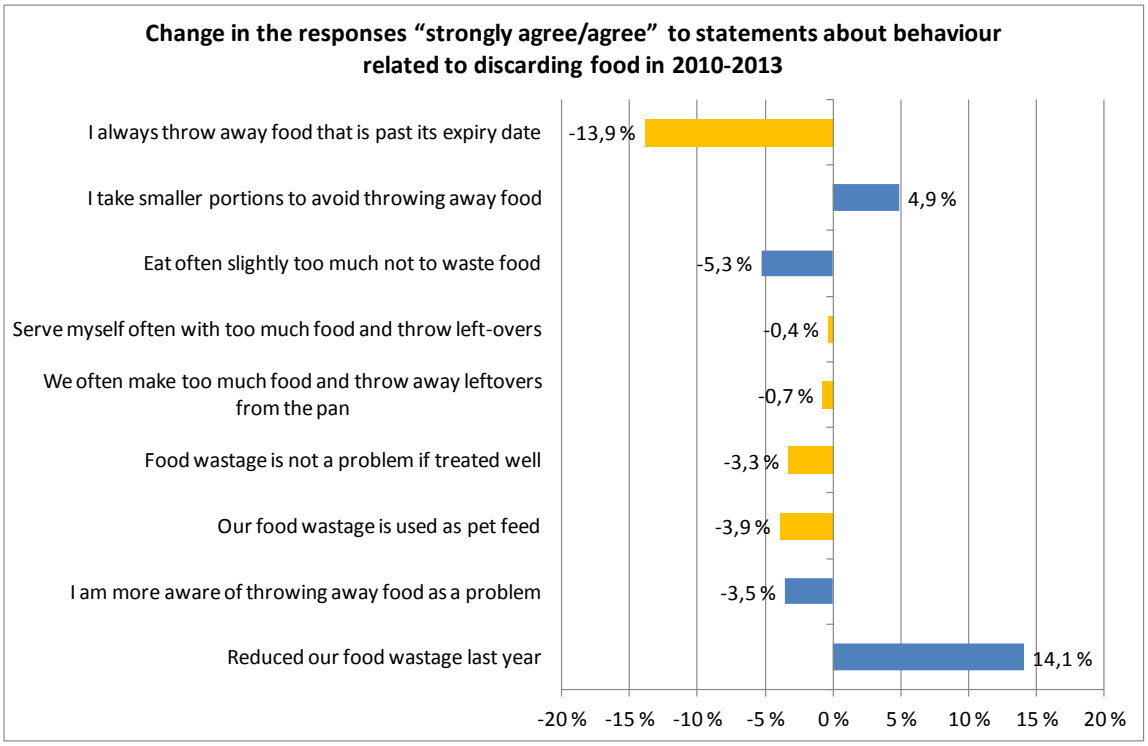

Figure 4-12 Percentage change in the responses "strongly agree/agree" to statements about behaviour related to discarding food in 2013 (blue bars can lead to reduced food wastage; yellow bars can lead to increased food wastage)

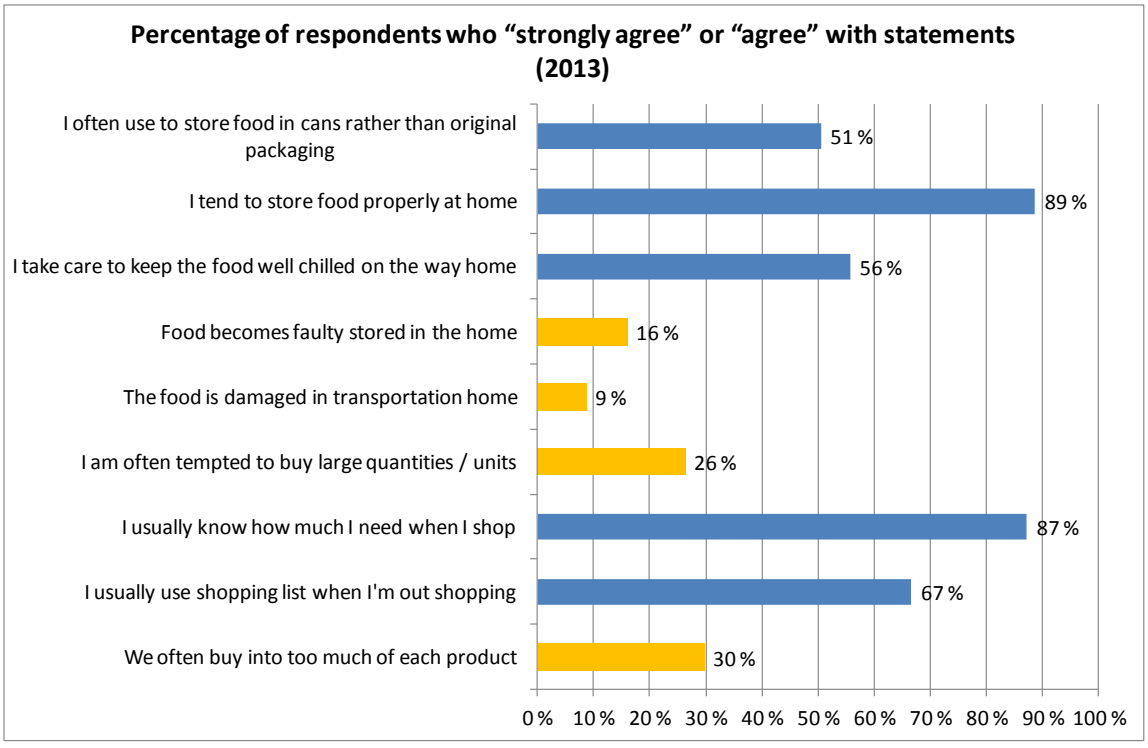

Figure 4-13 Percentages responding "strongly agree/agree" to statements about behaviour related to discarding food in 2013 (blue bars can lead to reduced food wastage; yellow bars can lead to increased food wastage)

Figure 4-14 shows the overall results of attitudes and behaviour related to handling and storage of food. There are 28% fewer people reporting food being damaged due to transport home in 2013 than in 2009, and at the same time 24% more ensure that food is kept well chilled during transport home. There are also more who report that they use a shopping list when shopping (8%), although in 2010 there were already 60% who reported generally using a shopping list. On the other hand, there are 7% more people who report often buying too much of each product in 2013 than in 2009, and 3% more who are tempted to buy too large amounts. There is also an increase of 12% in those who state that food is often damaged and discarded because it has been not been properly stored at home.

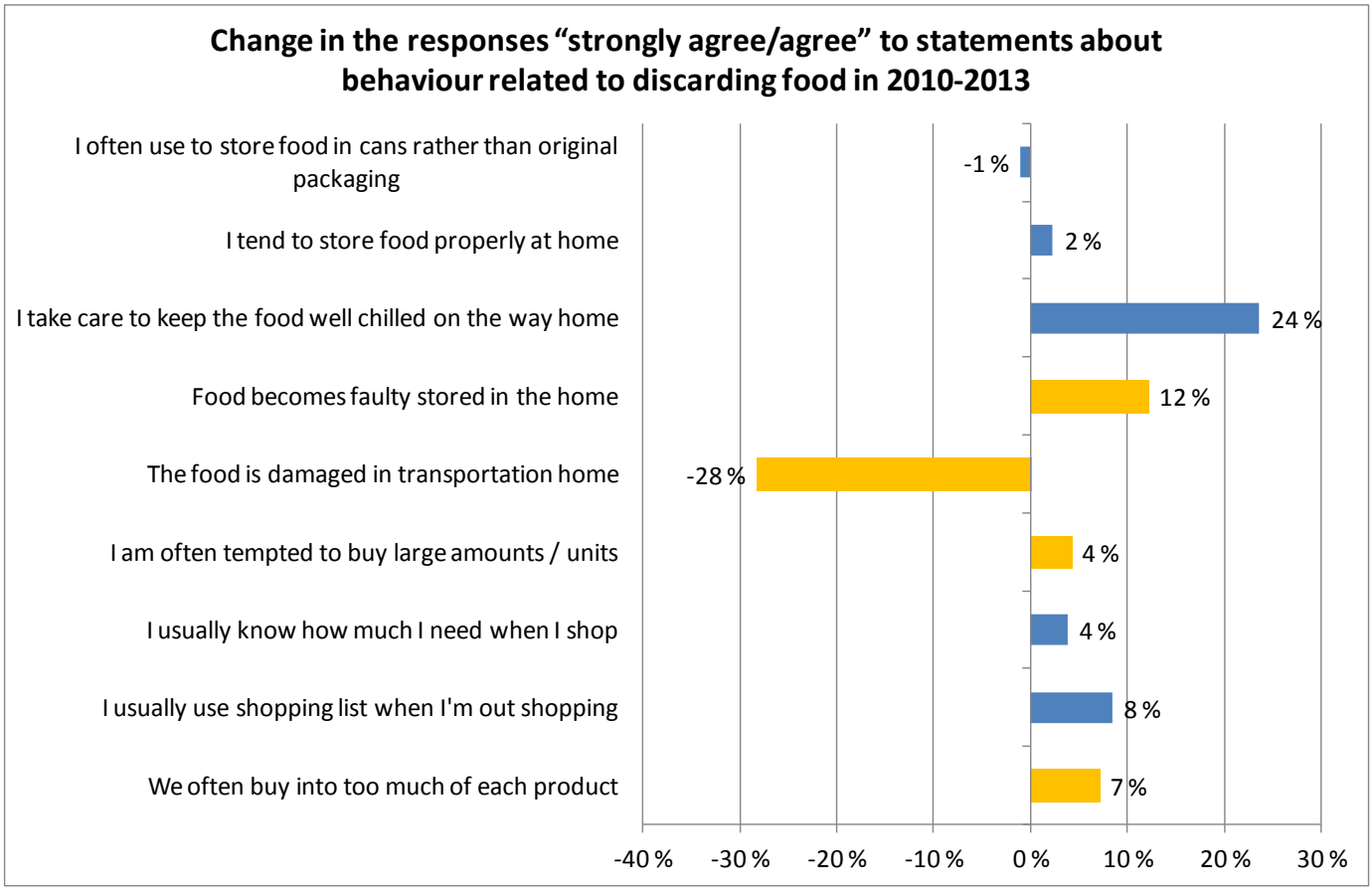

Figure 4-14 Percentage change in the responses "strongly agree/agree" to statements about behaviour related to discarding food in 2013 (blue bars can lead to reduced food wastage; yellow bars can lead to increased food wastage)

These results must also be interpreted with caution because consumers often do not answer honestly or correctly in questionnaires. However, since the same methods have been used for four years with a large amount of data and show relatively little variation, there is reason to interpret many of the results as positive signs in people's attitudes and behaviour related to discarding food as a problem.

4.5 Results from Networking

In 2011, the ForMat project took the initiative to establish network projects across value chains in three product groups, in order to analyse the reasons why food wastage takes place and to specify measures aimed at preventing it (see Hanssen & Schakenda 2011). The three product groups were fresh meat, fresh ready-made meals (salads and pâtés) and dairy products. The networks consisted of representatives of retailers and producers, assisted by researchers from Ostfold Research and Nofima Food Research Institute. All networks helped to provide more detailed data on food wastage for selected products from producers and retailers, with a focus on individual products with a high percentage of wastage in relation to revenue. Two main lessons learned from this work were that forecasting needs to be improved through closer cooperation between client and supplier, and that the system of a threefold division of product life between producer, wholesaler and retailer in the common standard STAND 001 may be too rigid and should be reassessed. In the network for fresh meat products, new distribution procedures were tried out. Limited volumes of products approved in the value chain profile were automatically sent to retail outlets in order to avoid wastage. This led to strong pressure in the entire value chain on these products. The tests had a positive outcome, and discarding a great deal of meat was avoided, e.g. barbecue meat, where it is difficult to plan production and purchases due to unreliable weather.

One important result of the network project is that DLF (Grocery Producers of Norway) and DMF (the Norwegian Grocery Sector's Environmental Forum) have set up a working group under STAND to facilitate reduced food wastage throughout the value chain, for example by proposing a revised standard for fresh food management (<40 days total product life). The group represents the entire value chain, and will focus on determining total product life, distributing product life within the value chain and optimising the number of consumer units in a retail package. The working group's proposals will be submitted to STAND for a final decision and the first results are expected in 2014.

4.6 Mapping of Food Wastage by Producers and Retailers

As part of Subproject III with network development, DLF, DMF and Ostfold Research have prepared a simple questionnaire where companies themselves can describe their own "here and now situation" with regard to food wastage, both in production and in shops. This work has been coordinated with the research project Food Waste Prevention, and by answering 12 questions with simple alternatives to be ticked, companies will now be able to enhance their awareness of their own food wastage and find out how much they really know about it. A simple calculation tool was also developed to assist companies in assessing what food wastage currently costs them in terms of lost revenue and waste management expenses. The system has been tested in some companies in 2013 and will be part of a common "toolbox" for DLF/DMF and the ForMat project. To encourage companies to adopt the tool, called the "ForMat Check", a separate website is also being developed under www.matsvinn.no together with a short video and PowerPoint presentation to explain its purpose and use.

4.7 The Oslo Food Bank

In 2012, the ForMat project was requested to take responsibility for further progress in the work by establishing a food bank in Oslo. The basis for this was a pilot project carried out by the grocery retail company Norway Group, in cooperation with the Ministry of Agriculture and Food and the Church City Mission, which had recommended the establishment of a food bank as a means of reducing food wastage from shops, wholesalers and producers. The ForMat project has led efforts to obtain funding for a follow-up project where DMF, DLF and the Food and Beverages and Food and Agriculture sections of the Confederation of Norwegian Enterprise (NHO) contributed financially, and where it was recommended to establish a food bank in the spring of 2013. The Salvation Army, Blue Cross and Church City Mission have now established a cooperative (Matsentralen SA) to run the food bank, which was officially opened on 2 September 2013. It has received financial support from the Kavli Foundation, Norway Group, COOP, ICA, Tine, Nortura, BAMA and the Ministry of Agriculture and Food. It is estimated that the food bank will meet the food needs of about 3000 clients daily, which will reduce food wastage by up to 1,000 tons annually.

4.8 International Cooperation

4.8.1 The FUSIONS Project

In 2012, funding was announced for a major research project on food wastage under the European Commission Framework Programme 7 (FOOD). Ostfold Research was invited to collaborate with other research groups in Europe, with the ForMat project as a Norwegian reference group and member of the partnership of users. The FUSIONS Project (Food Use for Social Innovation by Optimising Waste Prevention Strategies[1]) was approved by the EU in the spring of 2012, and started in August 2012 with a duration of four years. The project has 21 research partners in 13 EU countries, and all the Nordic countries except Iceland are involved. The project aims to:

- Harmonise definitions and methods of food wastage monitoring in Europe
- Improve understanding of how social innovation can reduce food wastage
- Develop guidelines for a common Food Waste Policy for EU-27

Ostfold Research plays a key role in the part of the FUSIONS project concerned with the harmonisation of methods for monitoring food wastage. In cooperation with SIK and IVL in Sweden, WRAP in the UK, MTT in Finland, the University of Vienna in Austria and BIOIS in France, efforts are coordinated to describe the experiences of past and present projects in both Europe and the United States and form a basis for a common methodology. In this work, the experiences from the methodology developed in the ForMat project are of great benefit.

4.8.2 The Nordic Council of Ministers

In recent years there have been a number of joint projects in the Nordic countries funded by the Nordic Council of Ministers to explore problems and challenges in the area of food wastage, e.g.

[1] http://www.eu-fusions.org/what-is-fusions

- A joint study of food wastage in the grocery sector (Stenmarck et al. 2011)
- A joint study of food wastage in the Horeca sector (Martinsen et al. 2012)
- A joint Nordic seminar on food wastage in the grocery and Horeca sectors in Oslo in June 2012 (Hanssen et al. 2012)
- A joint Nordic pilot project on food wastage associated with primary production, where the findings have yet to be published.

All these projects have been funded and coordinated by the Working Group on Waste Prevention under the Nordic Council of Ministers.

In spring 2013 a new large Nordic project was initiated by the Working Group on Food, which included suggestions for suitable topics from the Norwegian ForMat project, among others. In April 2013 a project start with three sub-projects was approved; this involves all the Nordic countries except Iceland and the management of the project and sub-projects is divided between the Nordic countries:

- Further work on mapping and documentation of food wastage from primary production in the Nordic countries, led by Sweden
- Evaluation of how date marking is practised in the Nordic countries, and how this affects the amount of food wastage, led by Finland
- Evaluation of schemes for the redistribution of food by voluntary organisations, using e.g. food banks, led by Norway.

The project has a total budget for 2013-14 of about NOK 4 million, and the ForMat project is to serve as reference group for project work in Norway.

5 Discussion

The results of this report summarise four years of systematic studies of food wastage in Norway through most of the food chain. The results are unique in an international context, since there are no similar systematic studies of developments in the amount of food wasted over several years from any other country (see Møller et al. 2013).

It is important to point out that the data basis only consists of a small selection of businesses/persons in each part of the value chain, where perhaps especially the producer stage has a skewed representation towards large companies. Although the sampling has been relatively representative in terms of the proportion of the economic value involved, it would have been preferable to include data from more small and medium-sized businesses. This applies particularly to the bakery, meat and fish industries.

The results of the survey show few clear signs of reduction in the amount food wastage over the four-year period covered by the report. At the production stage, the results indicate a reduction in total food wastage over the period of about 16%, and in fresh bakery products about 10%. This is very encouraging considering the amount of fresh bakery products that is wasted and often ends up as animal feed. For fresh prepared food the trend seems to have been the opposite, since the amount of recorded food wastage has increased from less than 1% to over 2% in the period. However, in this case sales are relatively low overall, so this does not make a substantial impact on the total food wastage from the production stage. For fresh fruit and vegetables and fresh fish, it would appear that incorrect data were reported in 2009-10, since the figures for the percentage of wastage for 2011 and 2012 have increased considerably. Both these figures include industrially processed products which constitute a small part of the total sales of fruits and vegetables, and cannot be used as a basis to calculate the total wastage of the entire sector, since large volumes are either distributed unpackaged or packaged without any special processing (fruits and vegetables). The greatest wastage therefore probably occurs in the primary stage (especially for vegetables) and in the retail stage.

The amount of food wastage from wholesalers remains at a very low level and has little effect on the figures when the value chain is viewed as a whole.

The retail stage also sees little change in total food wastage during the period, when all the shops involved in reporting are considered. Overall wastage has remained stable at about 3.5% of revenue for the product groups throughout the period. Stores with a fresh food section showed a reduction in the percentage of food wastage from 2009-2011, but an increase in 2012 to approximately the same level as in 2009. However, there is some variation for individual product categories, where especially wastage of fresh vegetables and potatoes has been greatly reduced over the period, by 40% and 35% respectively of the percentage of wastage. For other products, especially fresh prepared food, sausages, sliced meat and fresh fish, wastage seems to have increased during the period, by 25-50% of the percentage of revenue. The percentage changes in wastage do not show the same effect in terms of weight, probably because the changes apply to product groups of relatively high value. This was the case from 2009-10, when in fresh vegetables the percentage of wastage decreased while the number of tons of wastage increased, because sales increased considerably without wastage showing an equivalent increase. There was thus a decrease in the percentage of wastage, while the total amount increased somewhat (Hanssen & Schakenda 2011).

For the consumer stage, there are no studies to provide a basis for updating the data on the amount of wastage per capita in Norway or the total waste from households, i.e. detailed waste sample analyses. The results in this report are therefore based on figures representing what consumers themselves report about changes in their food wastage behaviour. In addition, the data from the questionnaires provide an insight into what the respondents perceive to be the main reason for discarding specific product categories and more general information about behaviour patterns and attitudes with regard to food, meals and food wastage. Since the data are based on the consumers' own responses and not actual information on what is discarded and why, they must be treated with some caution. Overall, fairly consistent results over time provide a sufficient basis to assume that the trends shown reflect reality, and this also applies to patterns across product groups and food wastage issues.

There is a basis for concluding that the message about the scope of food wastage and its associated problems has reached a sizeable majority of consumers, since 50% say they have become more aware of the problem during the past year, and almost 40% believe that they have reduced food wastage in their own households. In the period 2010-13, this group has increased by almost 15%, which is also very positive. This is also reflected in the fact that consumers in another survey being conducted indicate reduced food wastage in almost all product categories in the period 2010-13, with quite considerable decreases (over 30%) for a number of categories. While this in no way indicates that the amount of food wastage has been reduced by similar percentages, the results can clearly be interpreted as showing that the message from the ForMat project has been taken to heart by many consumers. The challenge is that the statistics show a rather uneven age distribution, as people over 40 years old are generally more likely to report having become more aware of the problem and having reduced their own food wastage. This is the age group of the population which is already most aware of food wastage and which throws away least food, while the group most important to reach (under 40 years) does not provide such a clear positive response (Hanssen & Ose in prep.).

A large proportion of consumers also consider themselves to be good at planning purchases by using a shopping list and at storing food properly during transport home and in the home. On the other hand, there are many who say that they are tempted to buy too large or too many items (26%) or make too much food for their meals and throw away the leftovers (35%), and there are still very many people who discard food just because it is past the expiry date (30%). In the latter case, the figure has fallen by almost 15% during the period. When consumers are asked about the main reason for discarding food in specific product categories, this figure is much higher. For yoghurt and sour cream, over 70% state that they get rid of the product because it has expired, even if the date stamp is "best before". The proportion giving this response has also increased from 2012 to 2013.

In the Norwegian general waste statistics, food wastage forms part of what is termed "wet organic waste", where both food wastage and other waste from food production constitute an important share. Since the past and present proportions of food wastage in the total wet organic waste are unknown, the statistics cannot reveal changes in food wastage directly. As shown in Figure 5-1, there has been a considerable rise in the amount of wet organic waste in Norway from 70.5 kg per capita in 1995 to 112.4 kg in 2011, an increase of about 60%. This is probably related to a corresponding increase in food wastage, although food wastage makes up less than half of the amount of wet organic waste (51.1 kg per capita), based on calculations from extensive waste sample analyses in 2011 (Hanssen

& Schakenda 2011). The amount of wet organic waste per capita appears to have decreased by about 5% from 2007 to 2011, from 117.5 kg to 112.4 kg, which may also indicate that the amount of food wastage has decreased over the past 5 years. The data on household waste are based on reports from local councils on the amounts of general waste and separated wet organic waste, where waste sample analysis is used as the basis to determine the percentage by weight of wet organic waste in the general waste. This ratio has not changed since 2004, so it is uncertain whether it is total waste or wet organic waste that has declined during the period.

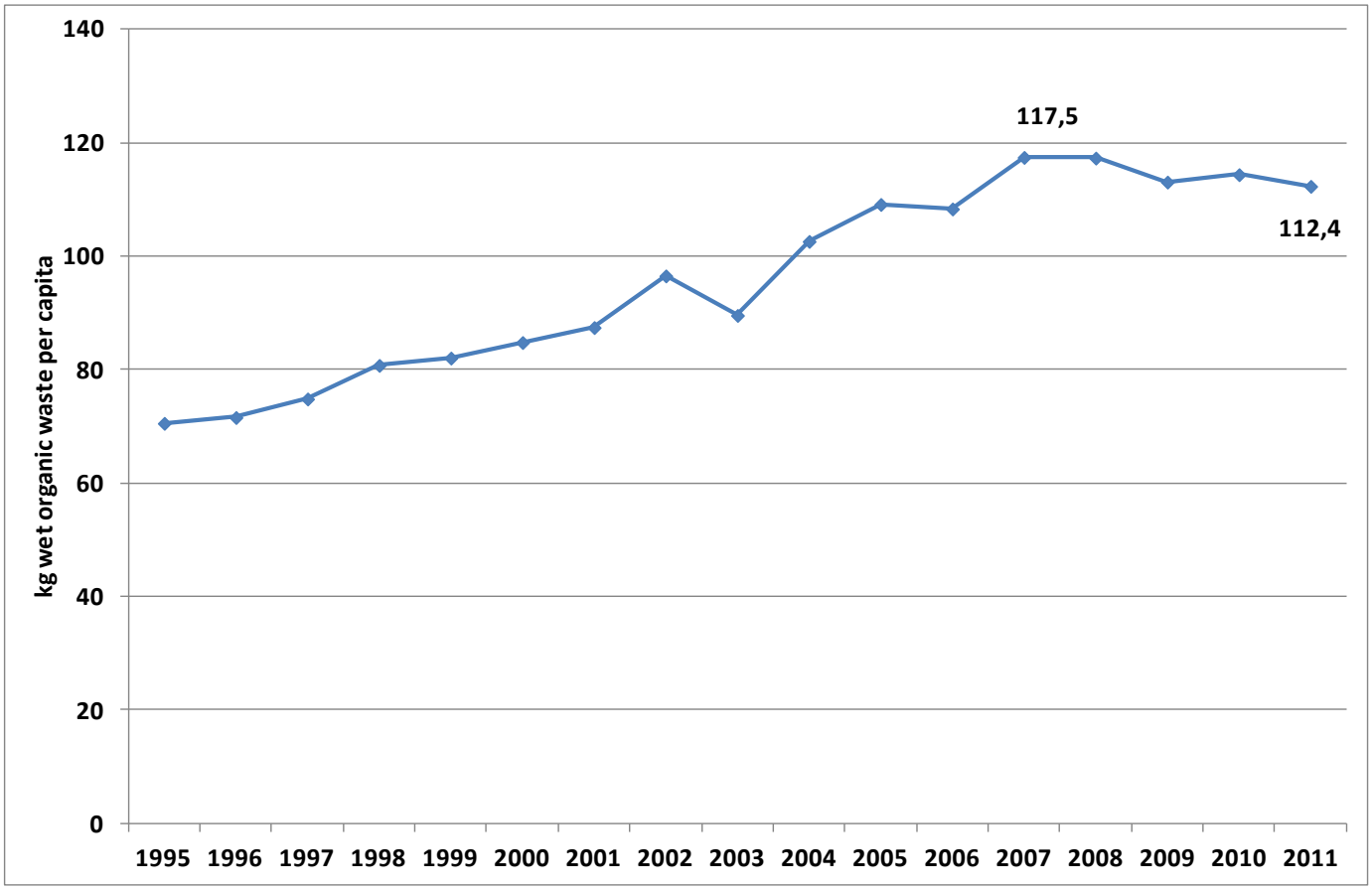

Figure 5-1 Statistics of wet organic waste per capita for 1995-2011 based on the Statistics Norway Waste Account for Norway

In order to illustrate the total amount of food wastage both from households and from the value chain, calculations have been made to show the overall effect over time. On August 1 2013 the Norwegian newspaper Verdens Gang published figures from the ForMat project showing that, based on estimated annual wastage per capita of 10.3 kg of fresh bread, 12.1 kg of fruit and vegetables and 11.3 kg of leftovers, the following are thrown away every day throughout the year:

- 190 000 fresh loaves of bread
- 580 000 bananas/cucumbers (as examples of fruit and vegetables)
- 270 000 dinner portions (based on the Ministry of Health standard diet)

As shown in Figure 5-2, the annual amount is the equivalent of a road 5.5 metres wide stretching all the way from Oslo to Kirkenes (1970 km). As shown in the article in Verdens Gang, the total annual

food wastage in Norway from producers, wholesalers, retailers and households is 1.5 times the volume of the Post Office Tower (the second tallest building in Oslo).

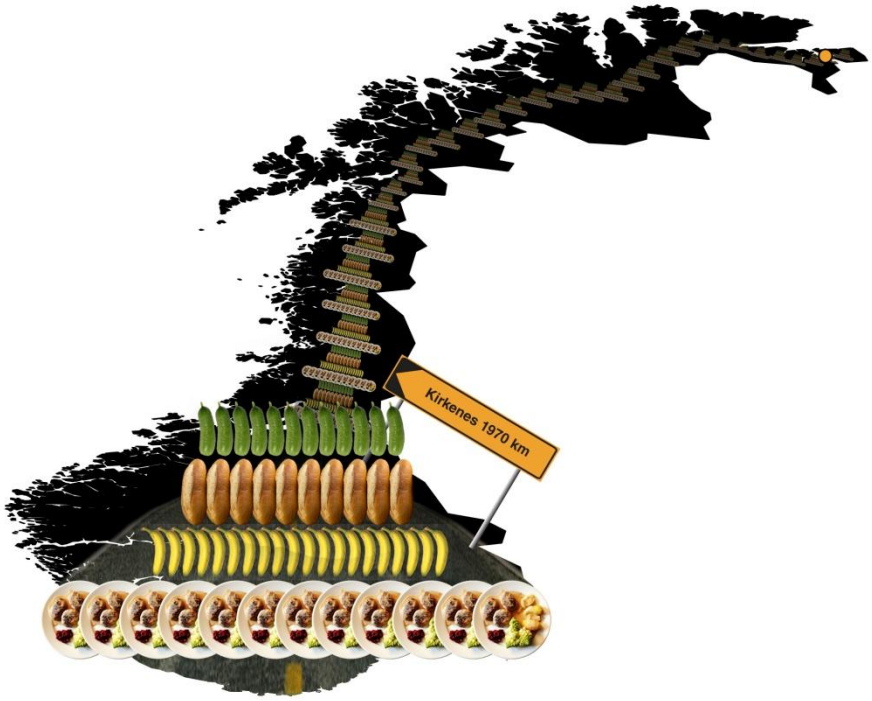

Figure 5-2 Illustration of the extent of food wastage from Norwegian households for fresh bread, fresh fruit and vegetables and leftovers

Although these figures are formidable and the experience of informing people that they throw away 51.1 kg on average is that few will acknowledge it, the numbers become more palatable when broken down into how much each of us throws away per month:

- 1.1 loaves of bread
- 3.5 cucumbers/bananas
- 1.6 plates of leftovers corresponding to a normal portion

In order to meet the goal of a 25% reduction in food wastage per year, it is thus quite a modest effort required of each of us. Each month we need to reduce our food wastage by about:

- 0.3 loaves of bread
- 0.9 cucumbers/bananas
- 0.4 plates of leftovers

These are figures that should make it easier to relate to the scope of food wastage in households, and may suggest that relatively little effort is needed to make a significant improvement.

The ForMat project started in 2010, but did not have the resources for extensive work on key target groups before 2011. As a result of a difficult financial situation, 2012 was a transitional year, where activity had to be adapted to limited resources, which also arrived late due to long processing times. The data from the first years from producers in particular, but also from consumers, date back to a period when the ForMat project was in its inception. Many actions were first launched in 2012 in the retail and production sectors and in the form of websites such as www.matvett.no. It is therefore likely that the actions now being implemented in 2013 when the finances of the project have improved will lead to reduced food wastage over the next few years. It is therefore important to monitor developments in the years to come, in order to review the possible effects of the measures and how far the goal of 25% reduction in food wastage is being realised.

More and better data are needed for the ForMat project in the future. This applies to industry, where only a few companies are providing data at present and where medium-sized and small businesses should be better represented. It also applies to retailers and to households; in the latter case, the local councils collect and treat the waste and could therefore provide the key to useful data. Here it would be preferable if more local councils could provide more detailed data from waste sample analyses, and if desirable also separate out usable food wastage as a special group, and in some cases also divide this up into different kinds of foods (e.g. fruit and vegetables, bakery products, meat and fish, dairy products, dry goods, leftovers from meals). This can best be done in conjunction with already planned waste sample analyses, with a little extra effort to separate out food wastage as one category or divided into some main types of food.

6 References

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Appendix 1 Detailed Results from a Survey of the Frequency and Reasons of Discarding Food from Different Groups

6.1 Frequency of Discarding Food from Different Categories

Fresh fruit, fresh vegetables and fresh bakery products
All three categories started at a relatively high level in 2010 (19%) and increased further until 2011 (2012 for fruit), but have decreased to 2013, so that these categories as a whole end up 8-16% lower than in 2010 (Figure 7-1).

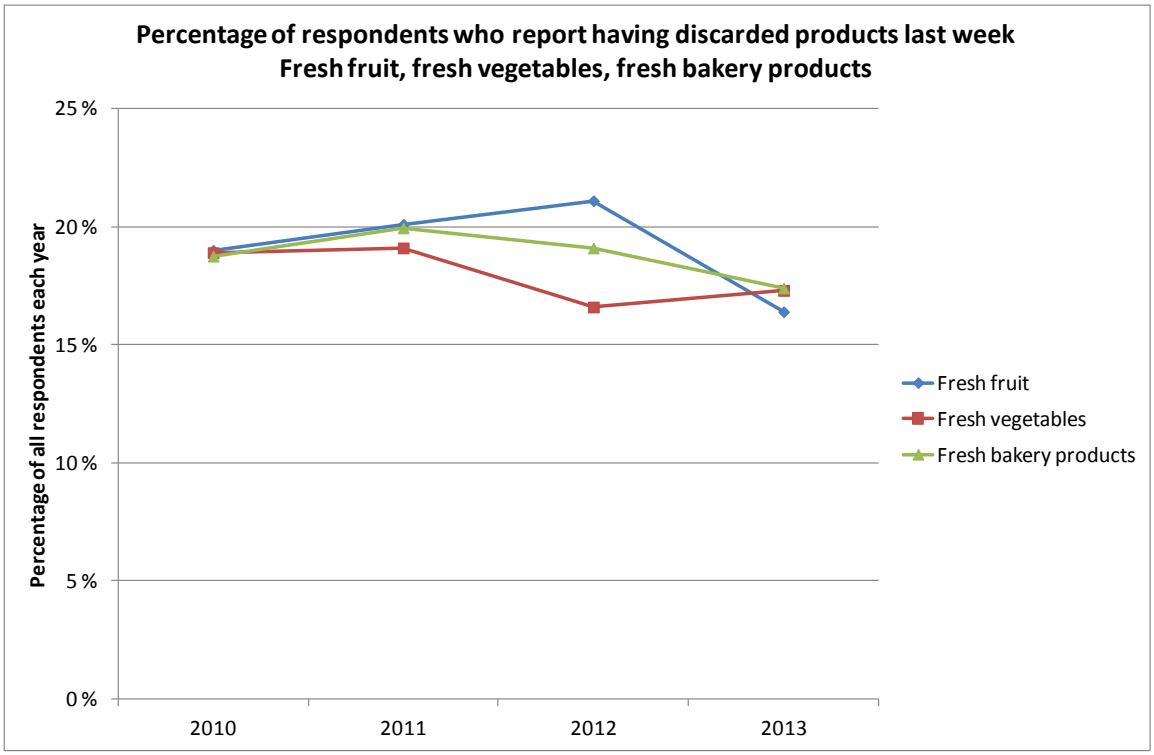

Figure 6-1 Frequency of discarding fresh bakery products, fresh fruit and fresh vegetables 2010-2013

Ready-made meals, fresh meat and fresh ready-made fish dishes
These are all categories with a relatively high price, where one might expect consumers to try to limit food wastage for reasons of economy. Fresh ready-made foods are reported to be discarded considerably less in 2013 than in 2010, showing a 24% decline in the period (Figure 7-2). The same percentage decrease is recorded for fresh sliced meat and there is also a decline for fresh meat. The only product that has increased in frequency is fresh ready-made fish dishes, where wastage has risen by about 9% from 2010 to 2013 (Figure 7-2).

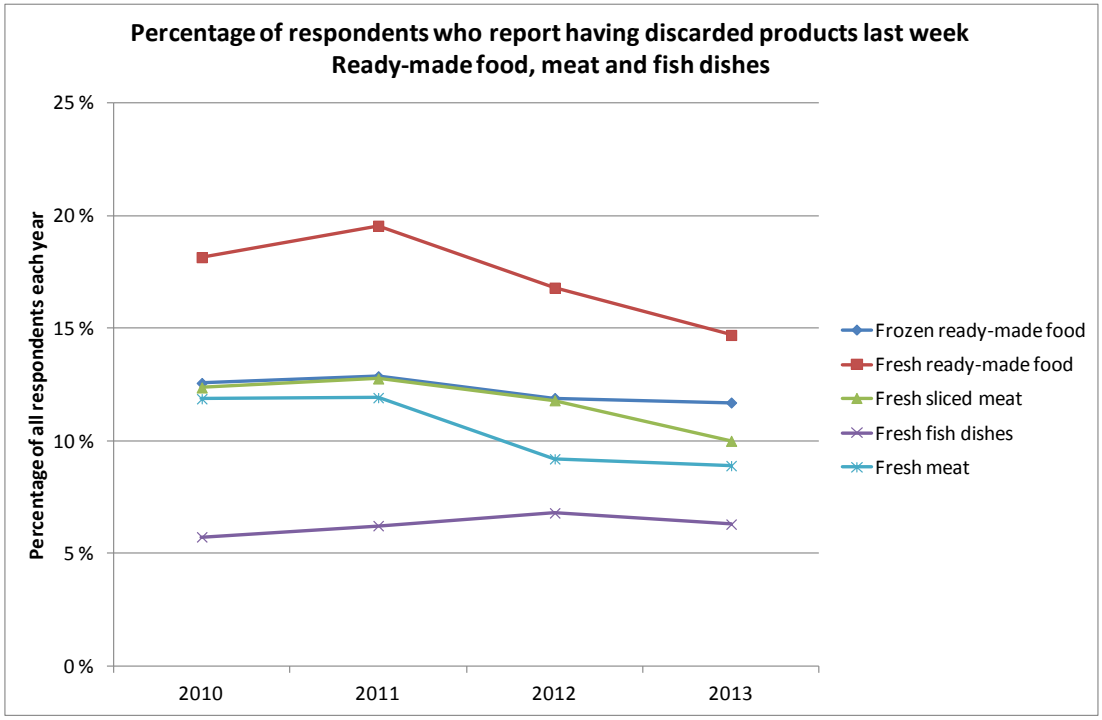

Figure 6-2 Frequency of discarding prepared foods, fresh meat and ready-made fish dishes 2010-2013

Dairy products and eggs

All these products have also seen a considerable reduction in frequency during the period, from about 25% to about 19% for milk/cream, but with the largest percentage decline for eggs, from about 6.5% to about 4.5%, corresponding to a reduction of 50% in the period (Figure 7-3). Perhaps it is the strong focus on date stamping of eggs that leads to unnecessary wastage in this category?

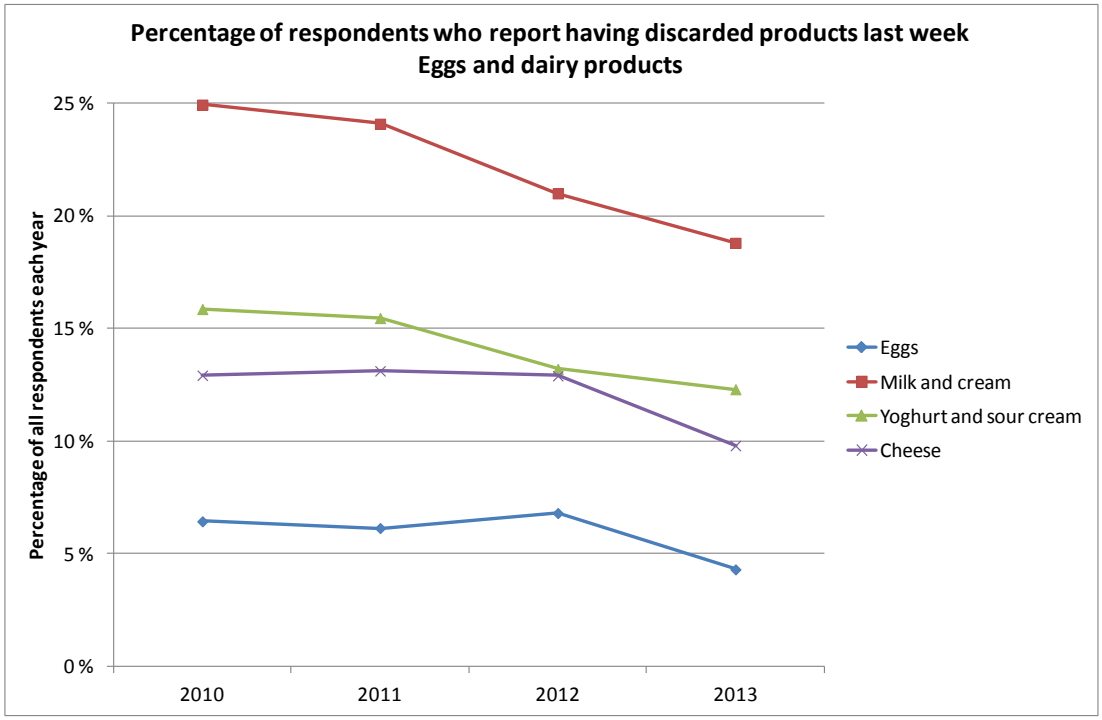

Figure 6-3 Frequency of discarding eggs and dairy products 2010-2013

Durable food products (snacks, dry food products, mayonnaise/dressings, biscuits)
These are products where one would expect lower frequency of wastage than for many other types of food, and they do in fact show much lower levels than the other groups (5-15%). Wastage in these products has also decreased somewhat, notably in snacks, where it has declined from about 15.5% to about 11.5% (Figure 7-4).

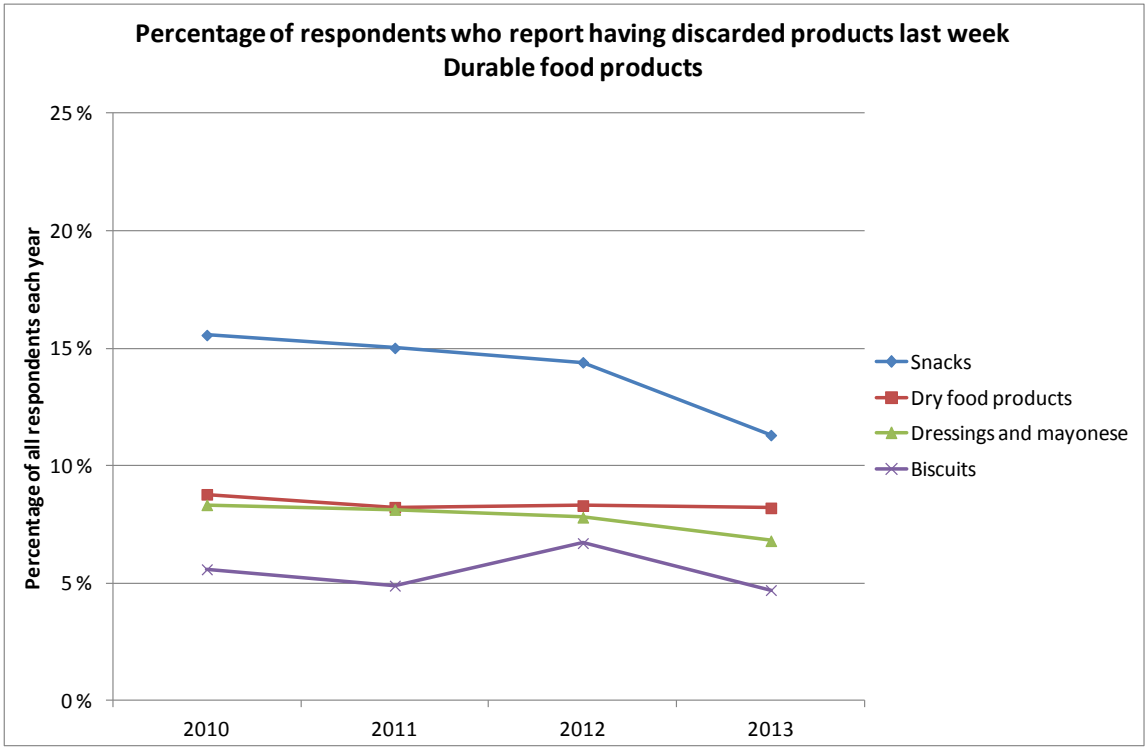

Figure 6-4 Frequency of wastage of durable food products 2010-2013

Pan leftovers

Pan leftovers thrown away either immediately after a meal or when clearing out the fridge after some days were not included in the questionnaire until 2011. These products are likely to be relatively expensive, and also have a high degree of processing, which should indicate that consumers would look after them better and be more reluctant to discard them. The ForMat project has also focused strongly on this "product category" through its involvement in the publication of the book "Love your Leftovers" and the concept of "Leftover Thursday" on the website www.matvett.no. Both pan leftovers after a meal and from the fridge show a rather high frequency at 25-30% i 2011. However, both have declined somewhat during the entire period, with about 6% less wastage for pan leftovers after a meal and about 3% for those from the fridge (Figure 7-5).

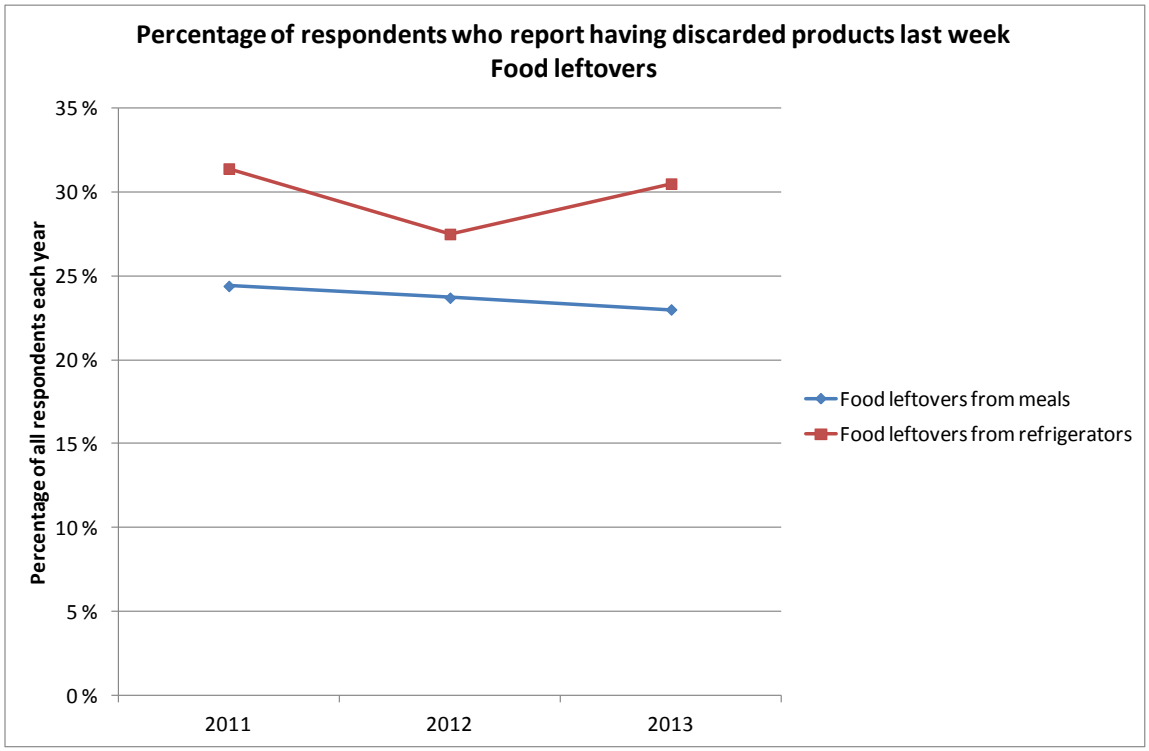

Figure 6-5 Frequency of discarding pan leftovers directly after a meal and from the fridge 2011-2013

6.2 Reasons for Discarding Food

The following figures show changes over time for all stated reasons for throwing away food in some main product groups. In general, the results show that "past its expiry date" is by far the most important reason for consumers to get rid of food, while "bad packaging" and "too much of the product in the container" are considered to have very little importance in all product groups. The exception was for fresh sliced meat and fresh fish dishes, where a relatively high proportion of consumers report that too much of the product in the container was the main cause of discarding the food (Figure 7-8).

Figure 7-6 shows the main reasons reported by consumers for throwing away fresh bakery products and the change over time for these. By far the most important reason given is that the product has

expired, where about 40% mentioned this as a very important or important reason in 2010. Then followed poor quality or bad taste, and thirdly that parts of the product were damaged or inedible. The fact that so many give “past its expiry date” as the main reason is probably due to misunderstanding the question, because there is no date stamp on fresh bread in Norway. The percentage of consumers giving expiry as an important reason declined somewhat from 2010 to 2013, while the percentage stating that parts of the product were damaged or inedible rose somewhat during the period (Figure 7-6).

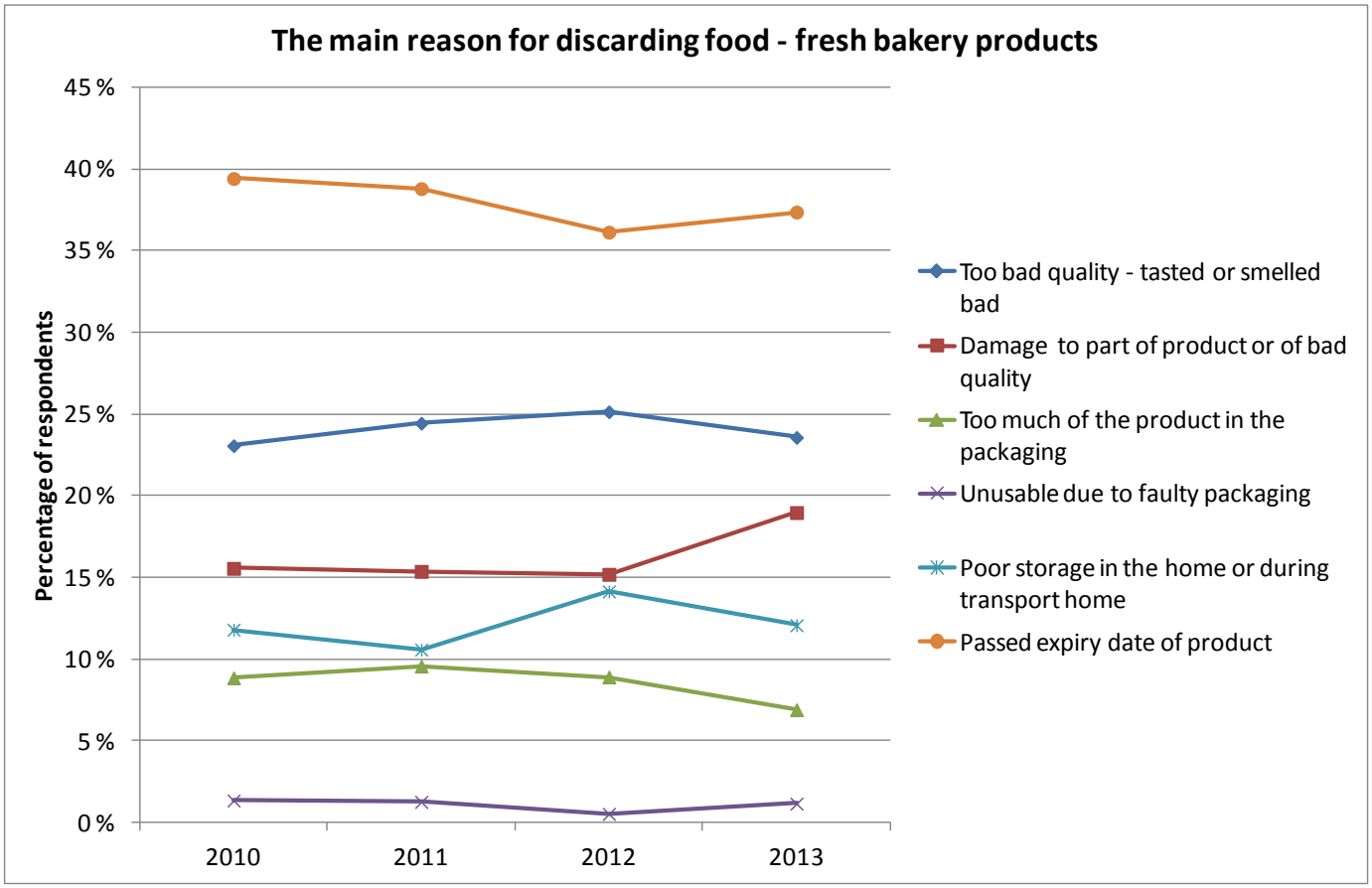

Figure 6-6 Importance of different reasons for discarding fresh bakery products 2010-2013

For fresh fruit and vegetables, parts of the product being damaged or inedible was given as the main reason for discarding the product by as many as 40% of consumers in 2010 (Figure 7-7). The next most important reasons were that the product had expired and that the quality was poor, at about 25% of respondents. The proportion reporting that parts of the product were damaged or inedible declined until 2013 to reach about 34%. For the other two types of reasons, the figures increased slightly in the period (Figure 7-7).

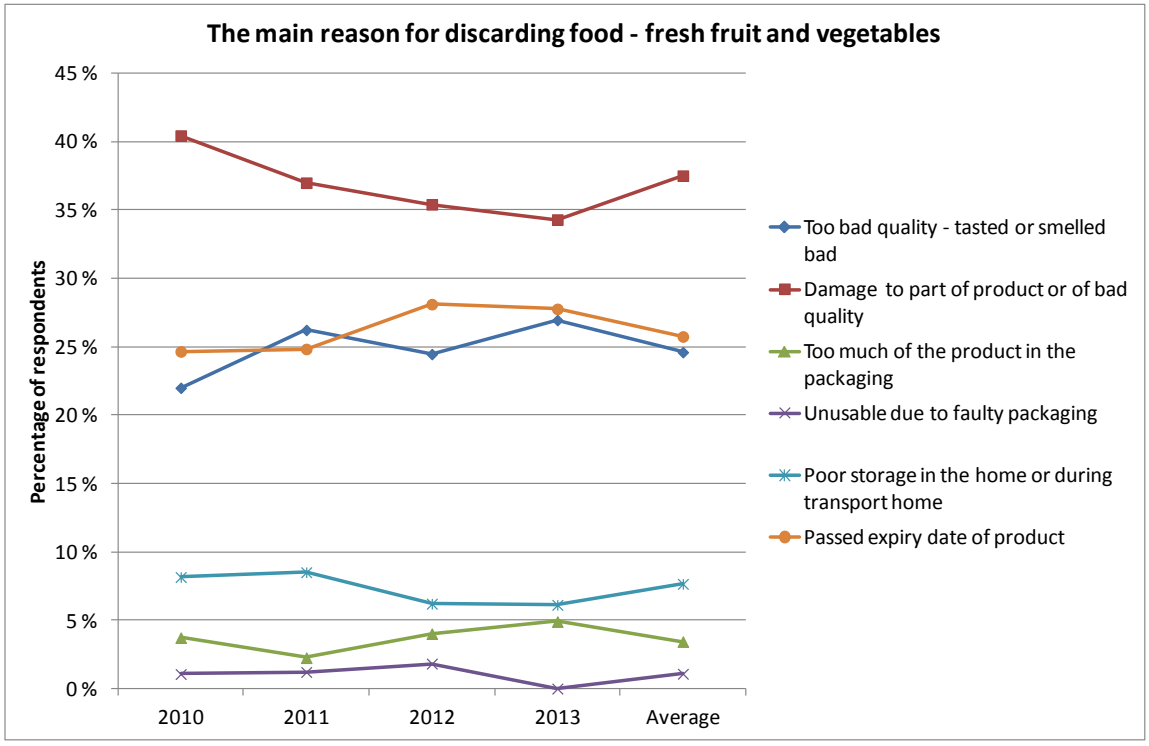

Figure 6-7 Importance of different reasons for discarding fresh fruit and vegetables 2010-2013

The expiry date is easily the most important reason for throwing away fresh sliced meat; more than 50% gave it as a very important/important reason in 2010 (Figure 7-8). Then follow poor quality and bad taste/smell at about 20%. The expiry date increased in importance during the period from 2010-13 to over 60%, while the other reasons were relatively stable over time.

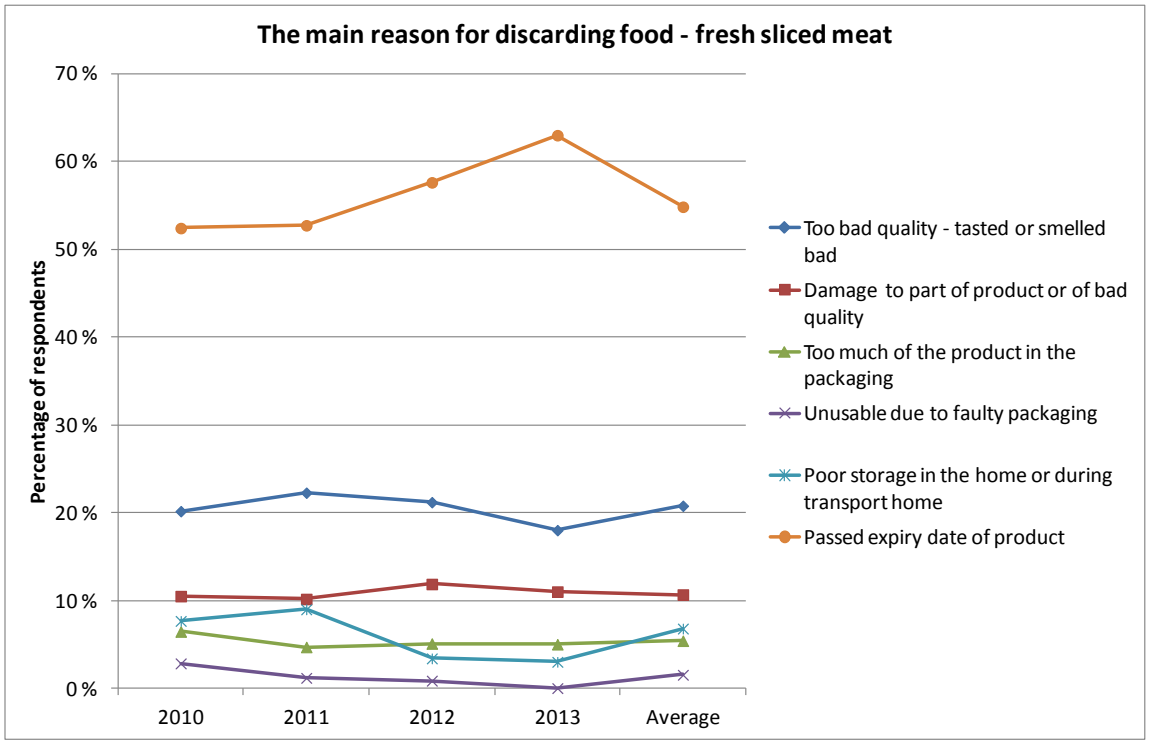

Figure 6-8 Importance of different reasons for discarding fresh sliced meat 2010-2013

For fresh fish dishes, the fact that the product is past its expiry date is also the main reason, at over 30% of respondents (Figure 7-9). Here the picture shows much more variation, since poor quality, too much of the product in the container, parts of the product being damaged and poor storage at home/during transport home all have relatively high proportions of respondents (12-23%). For this product category, responses also varied more over time than for the other products, especially from 2012 to 2013 (Figure 7-9).

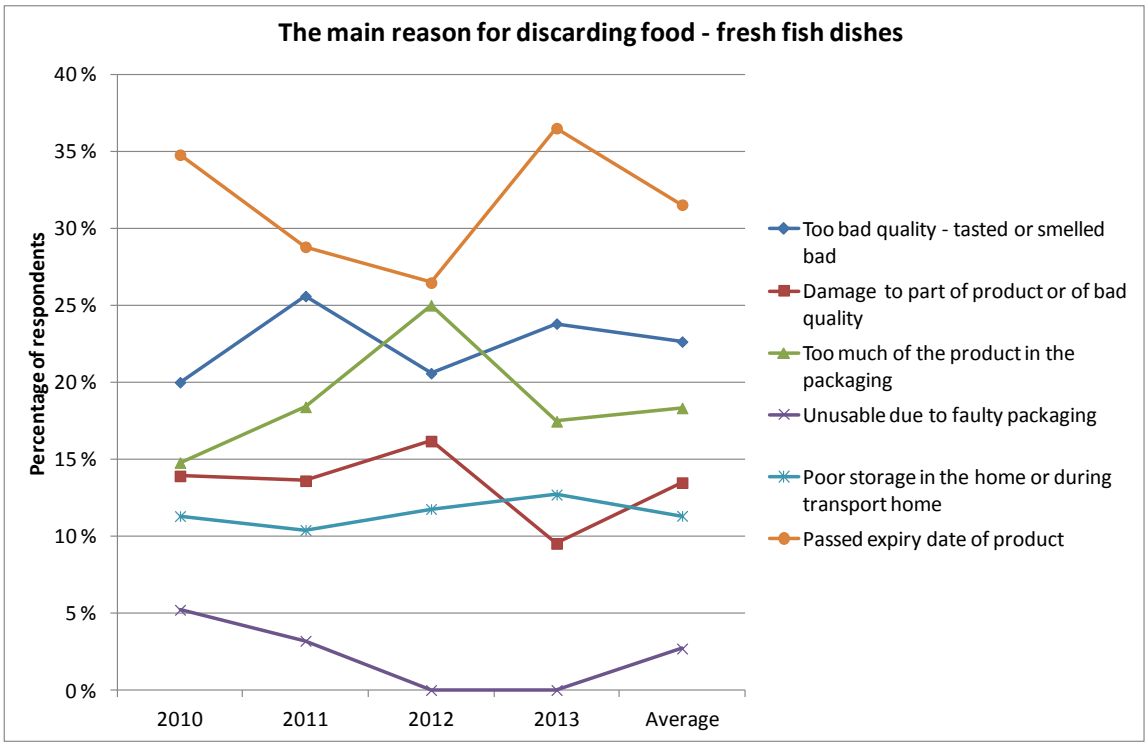

Figure 6-9 Importance of different reasons for discarding fresh fish dishes 2010-2013

Expiry of the product dominates completely among reasons for throwing away yoghurt and sour cream, with almost 70% of respondents giving this as a very important/important reason for discarding the product (Figure 7-10). This is something of a paradox given that such products are stamped “best before”, and can be consumed long after this date, if the taste and appearance are good. Another paradox is that many more consumers give expiry as an important reason in 2013 than in the previous year. Poor quality and parts of the product being damaged or inedible were the second most important reasons, and were relatively stable throughout the period (Figure 7-10).

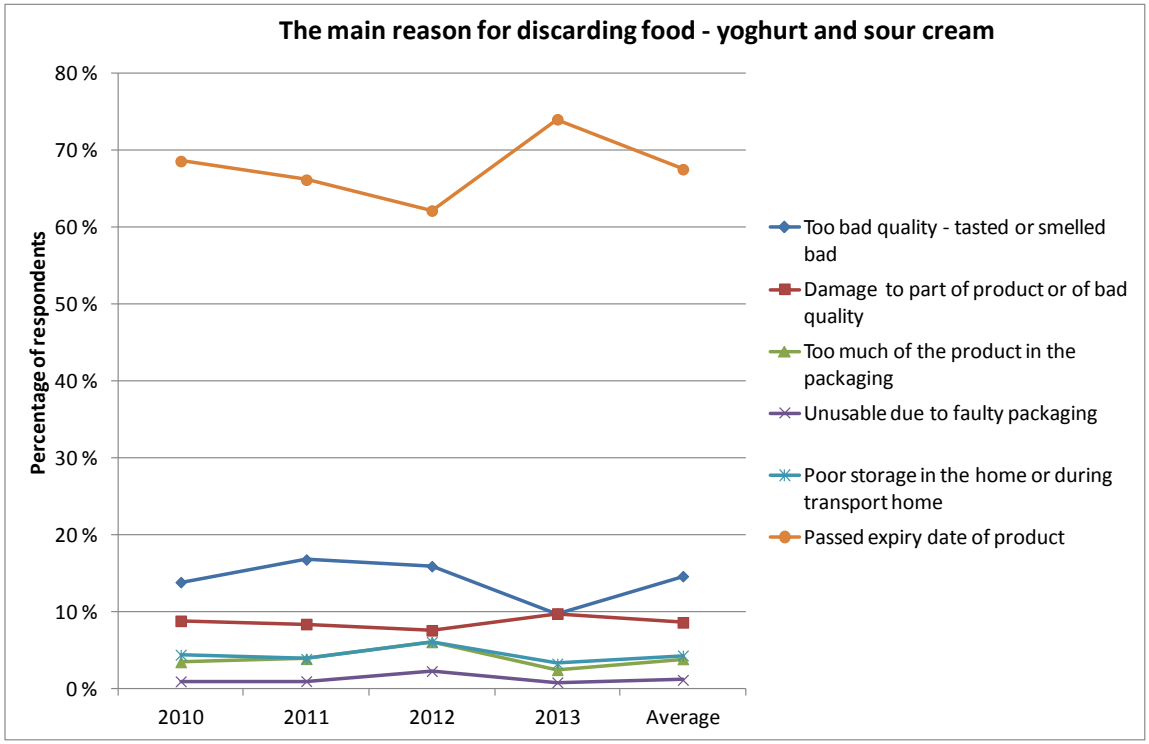

Figure 6-10 Importance of different reasons for discarding yoghurt and sour cream 2010-2013

6.3 Changes in Consumer Behaviour and Attitudes

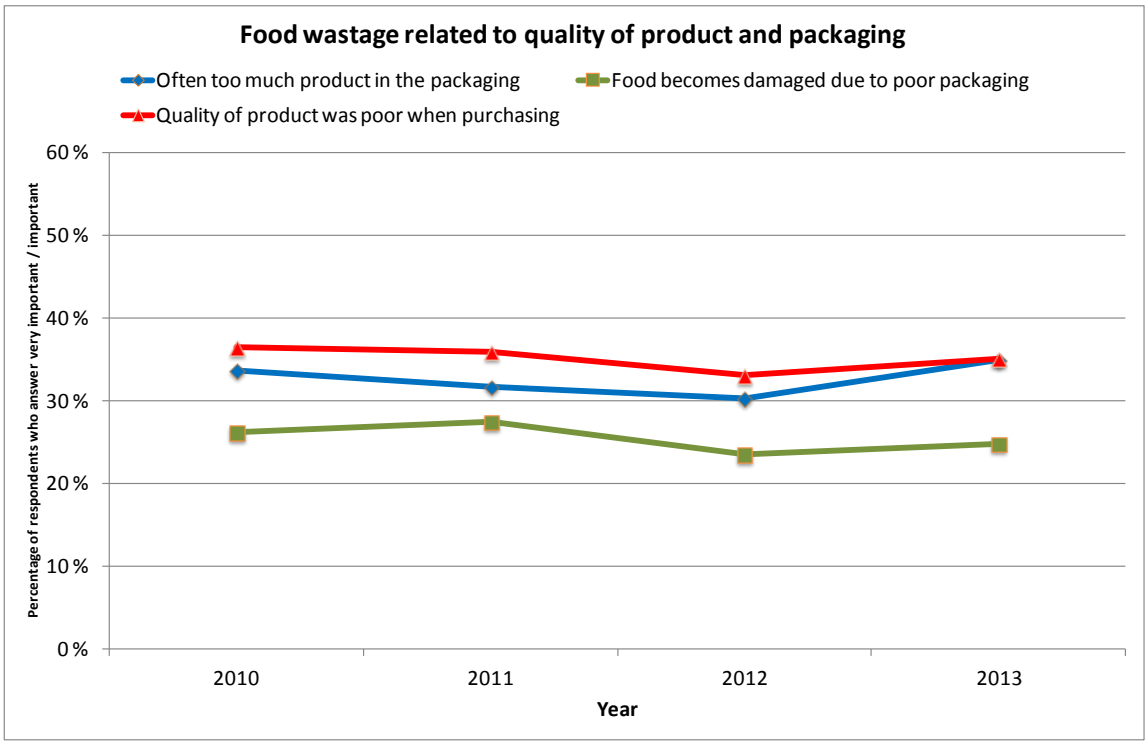

Figure 6-11 Importance of packaging and product quality as reasons for discarding food 2010-2013

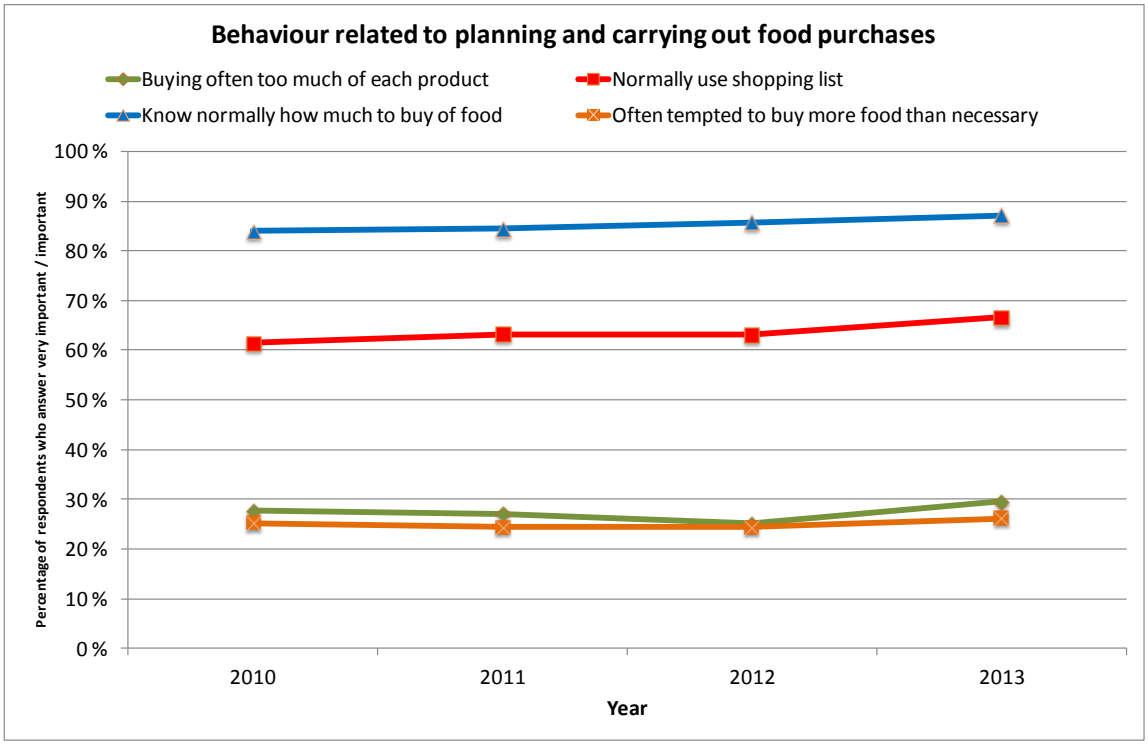

Figure 6-12 Importance of types of behaviour related to planning and carrying out food purchases as reasons for discarding food 2010-2013

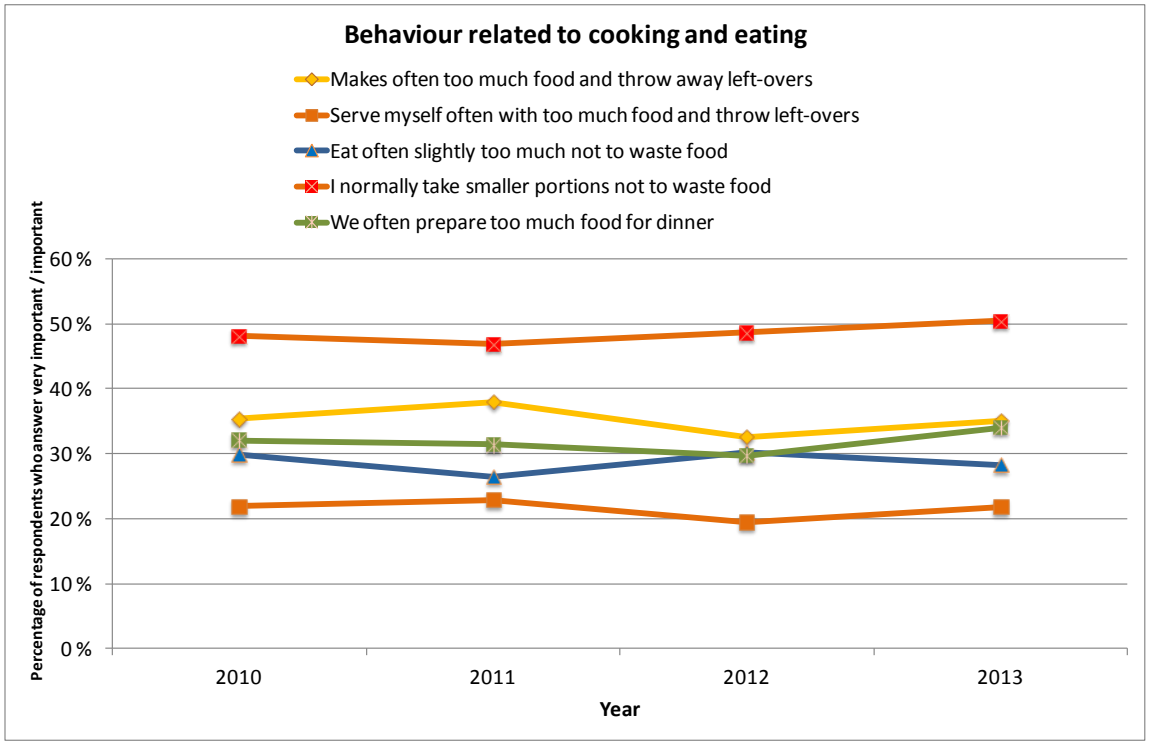

Figure 6-13 Importance of types of behaviour related to cooking and eating as reasons for discarding food 2010-2013

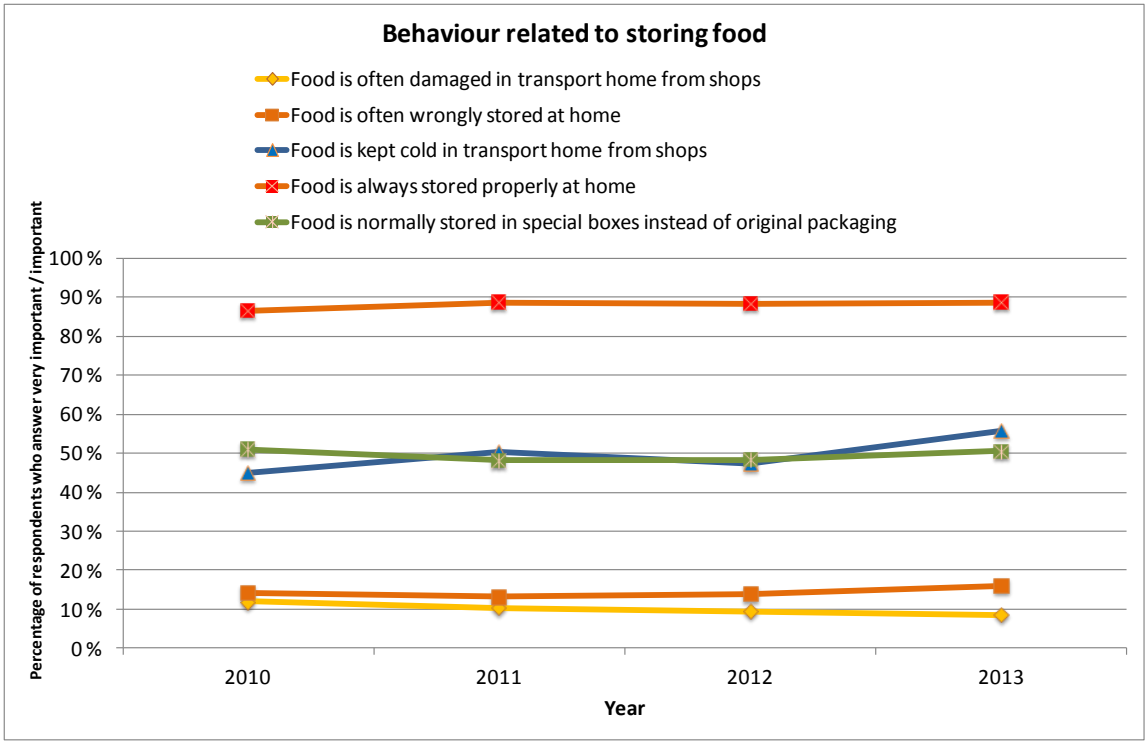

Figure 6-14 Importance of types of behaviour related to storing food as reasons for discarding food 2010-2013

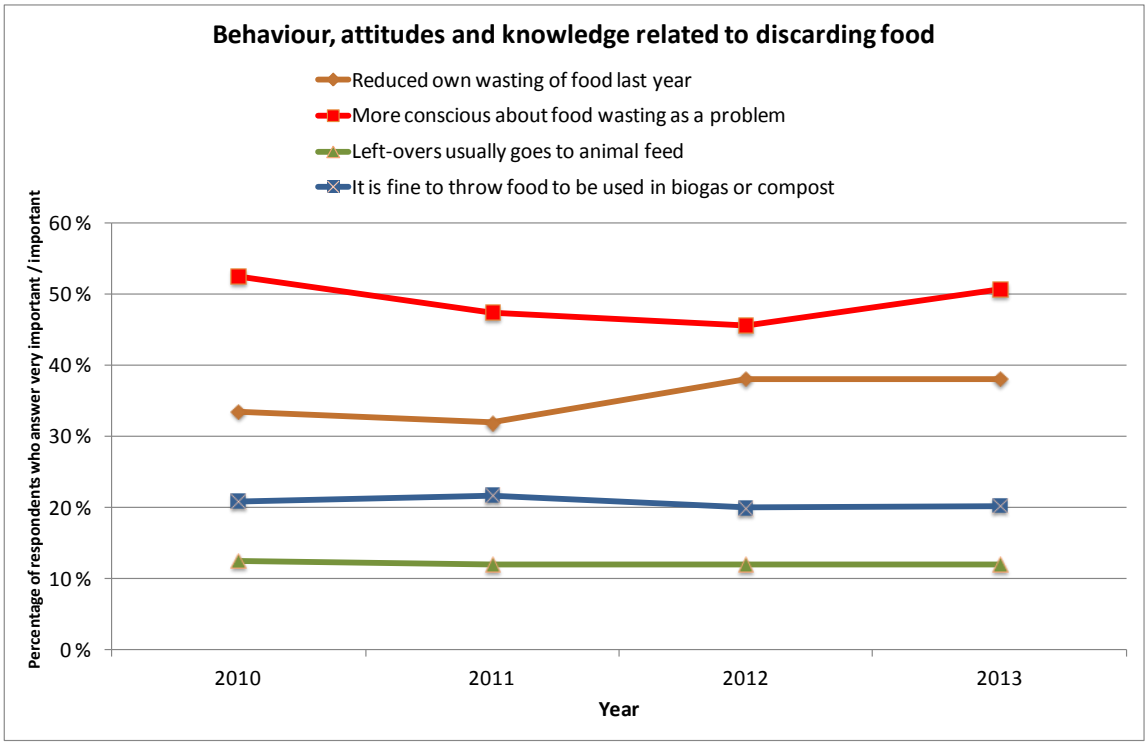

Figure 6-15 Importance of behaviour, attitudes and knowledge related to discarding food 2010-2013

Østfoldforskning
SUSTAINABLEINNOVATION

Gamle Beddingvei 2B
N-1671 Kråkerøy
Telephone: +47 69 35 11 00
Fax: +47 69 34 24 94
firmapost@ostfoldforskning.no
www.ostfoldforskning.no

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