



CHECKING OUT FOOD WASTE

THE MAIN FOOD PRODUCT TYPES THAT ARE
DUMPED OR REDUCED-TO-CLEAR
BETWEEN DEPOT AND
RETAIL CHECKOUT





The Industry Council for research
on Packaging and the Environment
SoanePoint, 6-8 Market Place
Reading RG1 2EG

Tel: +44 (0)1189 255 991

Email: info@incpen.org

www.incpen.org

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CONTENTS

Key points	4	Summary and Conclusions	17
Introduction	4	Appendix	19
Results	7	Product type	
Total wastage	7	- bread	
(dumped and reduced-to-clear)		- delicatessen chicken	
- by category:		- delicatessen ham	
financial value		- delicatessen turkey	
weight		- salmon	
- by product type		- tuna	
financial value		- bananas	
weight		- strawberries	
percentage of sales		- raspberries	
Dumped	10	- grapes	
- by category:		- cherries	
financial value		- blueberries	
weight		- mangoes	
- by product type		- uncooked chicken	
financial value		- steak mince	
weight		- beef	
percentage of sales		- lamb	
Reduced-to-clear	13	- vegetable oil	
- by category:		- eggs	
financial value		- sugar	
- by product type		- pizza	
financial value		- mushrooms	
weight		- tomatoes	
percentage of sales		- sweetcorn	
Differences between retailers	15	- broccoli	
		- asparagus	
		- red peppers	
		About INCPEN	26

INTRODUCTION

Food is grown or reared, processed and then packaged to enable it to withstand the stresses and strains of transport, storage and handling in the distribution system, retail display, and purchase, transport and storage by the consumer.

If it goes to waste before it is consumed all the resources – energy, materials, water, labour, time and money – used to supply and distribute, the food and its packaging are wasted.



KEY POINTS

This study identifies the top 20+ food types that are dumped or reduced-to-clear between depot and checkout.

Together they account for 22,000 tonnes of wastage in the retail supply chain every year.

Valued at £43 million, these products are either dumped because of damage or spoilage or sold as reduced-to-clear.

This is the first study of its type based on actual data from retailers rather than on interviews with retail representatives. It uses data from three major retailers who together account for 65% by value of the UK FMCG retail market.

Wastage is greatest in fruit (especially bananas, berries and grapes), vegetables, meat, poultry, bakery items and delicatessen chicken.

More than 13% of the value of tuna and more than 10% of delicatessen turkey and delicatessen ham are wasted.

Wastage accounts for 61% loss by value of all product losses in the retail supply chain. Shrinkage – mainly theft – accounts for the balance.

Additional research is needed to understand exactly where and why wastage occurs and to identify measures to prevent and reduce it.

Additional resources then have to be used to replace all the wasted packaged products. Wastage causes increased financial cost and environmental impact throughout the supply chain.

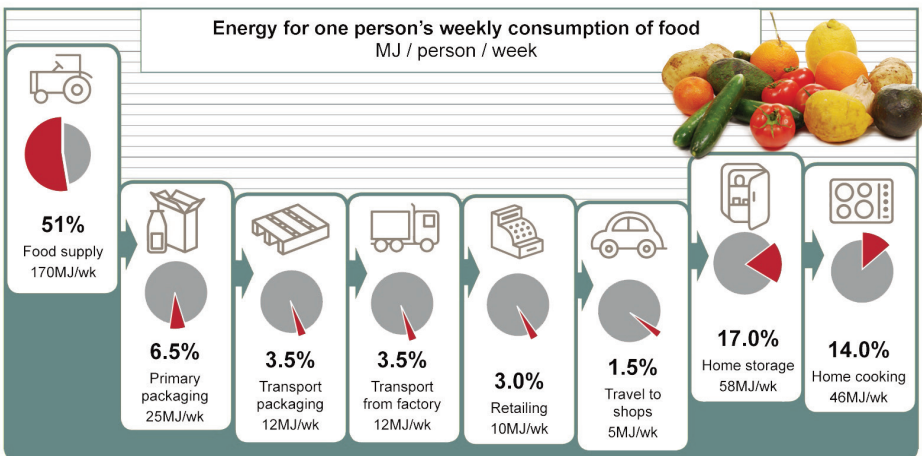
Wastage of foods between depot and checkout occurs for many reasons – mishandling, shelf life, over-ordering, poor stock rotation, inadequate packaging – even incorrect weather forecasts.

The study covers food products that become unsaleable because of damage or spoilage (dumped) or that have to be sold at reduced prices (reduced-to-clear) typically because they are near their “sell by” date.

It does not include “shrinkage”, which includes theft, pricing errors and checkout errors. It identifies the top 20 or so food product types that suffer the most wastage in the retail supply chain – between the depot receiving products from suppliers and the retail checkout.

The study was commissioned by INCPEN to identify and quantify the product types that experience most wastage in the retail food supply chain.

This report summarises the findings and we hope it will act as a catalyst for future work to identify where and why such waste occurs and then to find actions to reduce it.



The research was carried out by PEC Partnership, experts in analysing and assessing environmental and economic impacts of packaged goods. They worked with Professor Adrian Beck, a leading expert on product shrinkage at Leicester University, to convert the financial data on losses supplied by retailers into tonnages.

**THIS STUDY IS BASED
ON DATA FROM
RETAILERS RATHER
THAN ON INTERVIEWS
WITH RETAIL
REPRESENTATIVES.**

It uses data from three major retailers who together account for 65% by value of the UK FMCG retail market.

'The retailers' data were available in financial form and were converted into weight for each product type.

There are a few cases where data sets appear anomalous. This could be caused by several factors e.g. different retailers using the terms



"wastage", "shrinkage", "damage" and "spoilage" to mean different things; some retailers may dump a product when it is close to its sell-by date, others may reduce to clear; and data from individual retailers has had to be made anonymous through normalisation. However these factors should not affect the order of ranking of products and the results are still a clear indication of the order of magnitude of wastage.

**The full report is available from
INCPEN.**

RESULTS

TOTAL WASTAGE (DUMPED AND REDUCED-TO-CLEAR)

Total wastage of the top 20 product types amounts to 22,000 tonnes worth £43 million.

Three-quarters of that wastage comes from only nine products in the fruit, vegetables, meat, poultry and bakery categories. The top 20 products account for about 20% of the UK food retail supply chain wastage. There is a long “tail” of many hundreds of food products where wastage is very low.

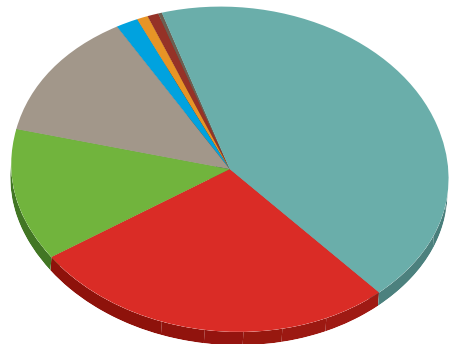
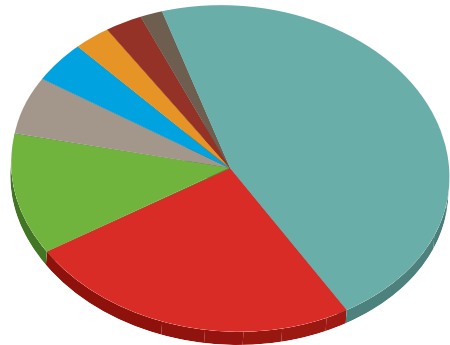
These two charts show that fruit accounts for nearly 40% of the wastage among these top twenty products in terms of both value and weight. Meat and poultry account for almost 20% of the total.

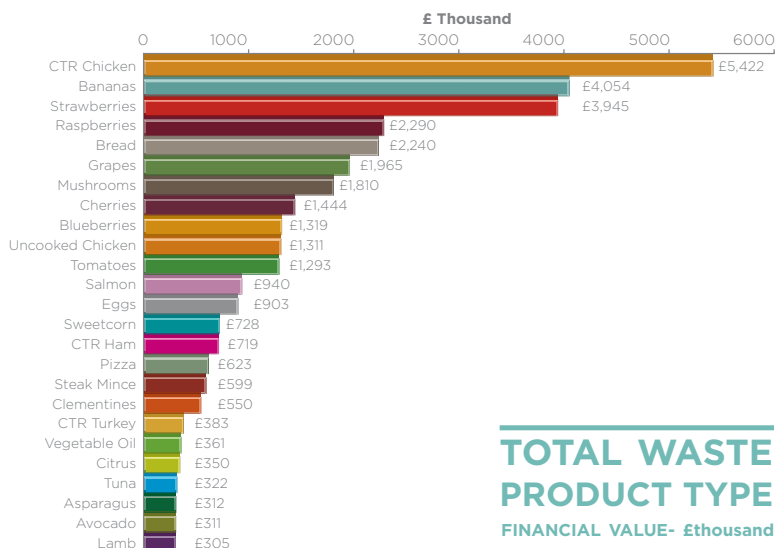
TOTAL WASTE PRODUCT CATEGORY FINANCIAL VALUE- £thousand

Fruit	£15,963
Meat & Poultry	£8,565
Vegetables	£4,078
Bakery	£2,066
Dairy	£1,351
Fish & Seafood	£1,013
Other	£930
Oils	£547

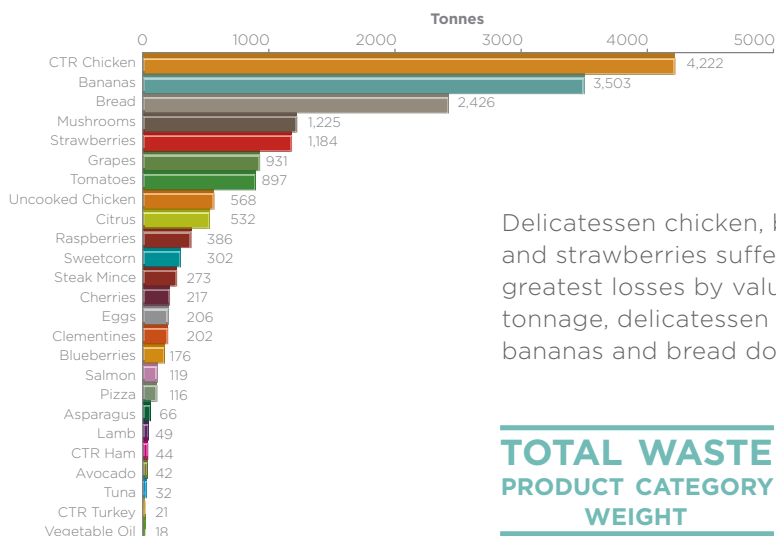
TOTAL WASTE PRODUCT CATEGORY WEIGHT

Fruit	7,668 Tonnes
Meat & Poultry	4,846 Tonnes
Vegetables	2,325 Tonnes
Bakery	2,277 Tonnes
Dairy	307 Tonnes
Fish & Seafood	181 Tonnes
Other	130 Tonnes
Oils	21 Tonnes



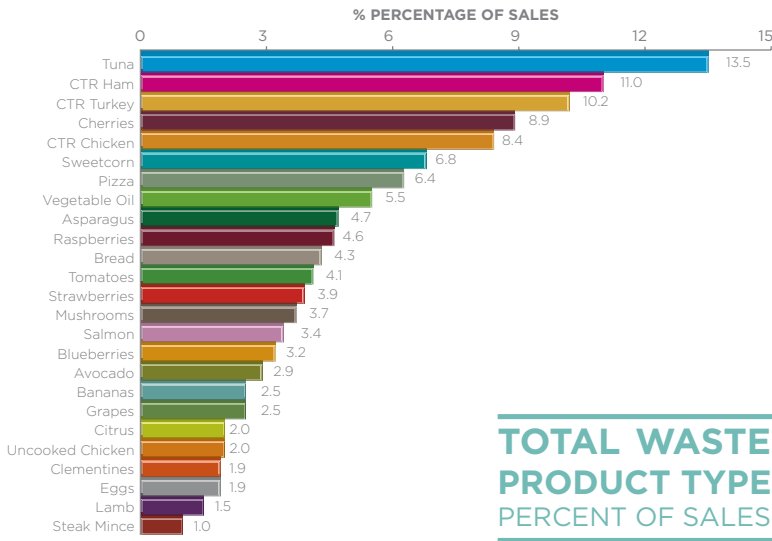


These two charts show the main total wastage product types, first by financial value and then by weight.



Delicatessen chicken, bananas and strawberries suffer the greatest losses by value; by tonnage, delicatessen chicken, bananas and bread dominate.

A different picture emerges from looking at losses according to the percentage of sales of a product type.



Tuna, delicatessen ham and turkey suffer the greatest percentage losses (10 to 13%), followed by cherries, delicatessen chicken, sweetcorn and pizza. A wide range of fruit, vegetables, meat and poultry and eggs suffer losses of 1-4%.

RESULTS

DUMPED WASTE

Arguably, the most important element of wastage in the retail supply chain is food which is dumped because of damage or spoilage. It has the maximum societal financial cost and environmental impact.

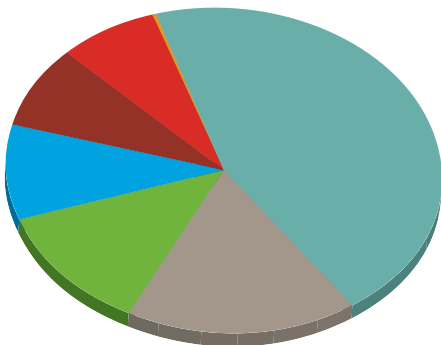
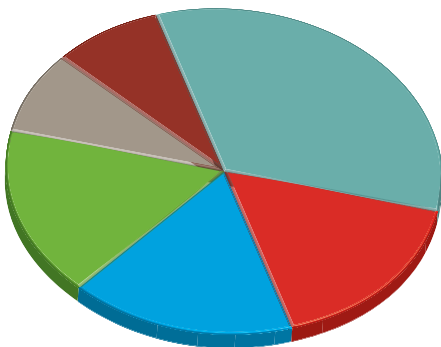
DUMPED WASTE PRODUCT CATEGORY FINANCIAL VALUE- £thousand

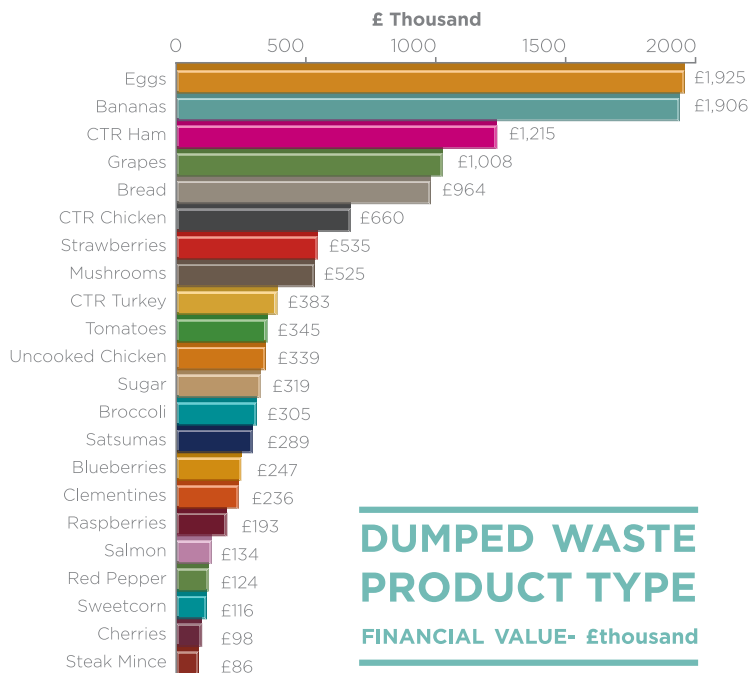
Fruit	£4,000
Meat & Poultry	£2,000
Dairy	£2,000
Vegetables	£2,000
Bakery	£1,000
Other	£1,000

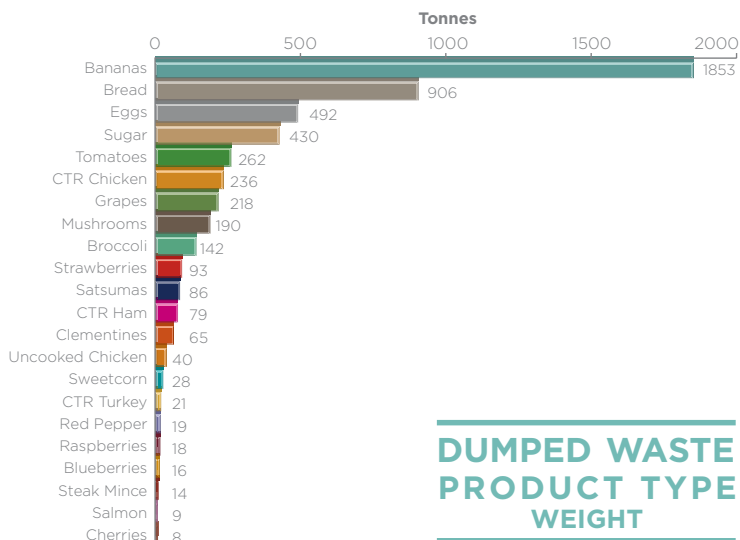
DUMPED WASTE PRODUCT CATEGORY WEIGHT

Fruit	2,357 Tonnes
Bakery	906 Tonnes
Vegetables	641 Tonnes
Dairy	492 Tonnes
Other	430 Tonnes
Meat & Poultry	390 Tonnes
Fish	9 Tonnes

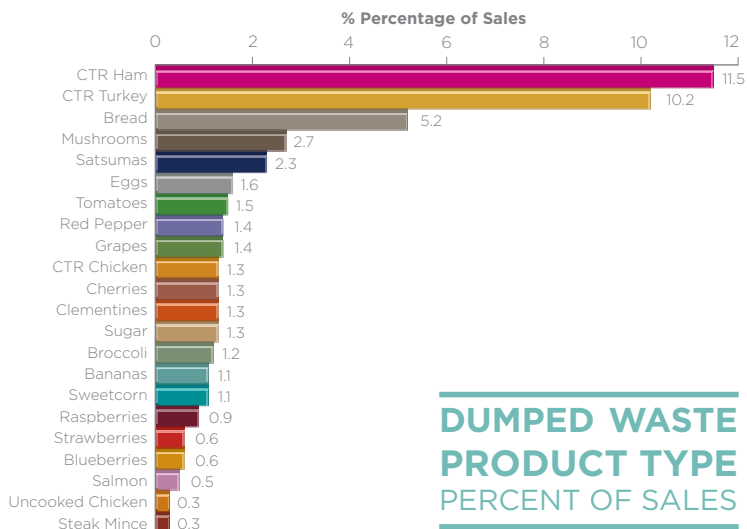
From the following charts it is clear that the product category most heavily dumped in terms of weight is fruit followed by bakery goods. When classified by value, fruit is still the predominant category dumped but it is now followed by higher value meat and poultry products.







Almost 12% of delicatessen ham, 10% of delicatessen turkey and 5% of bread is dumped. Eggs, bananas and a wide range of other foods show less than 2% by value being dumped. Whilst this is a low percentage, as the figure on page 11 shows it does give a large total financial value.



RESULTS

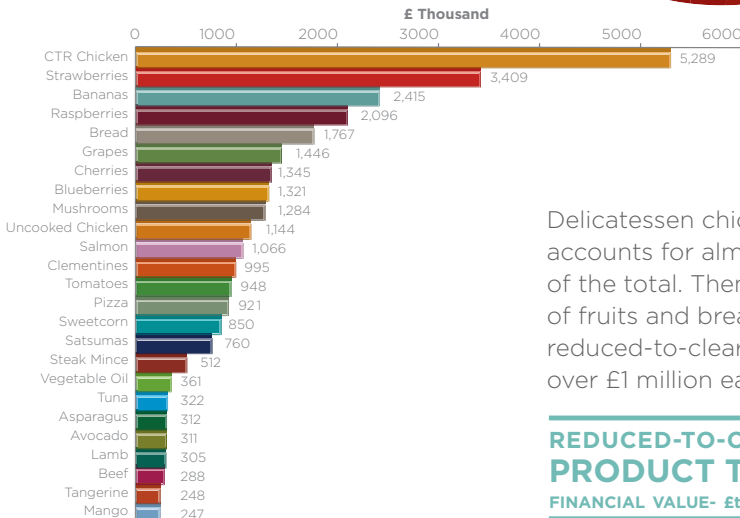
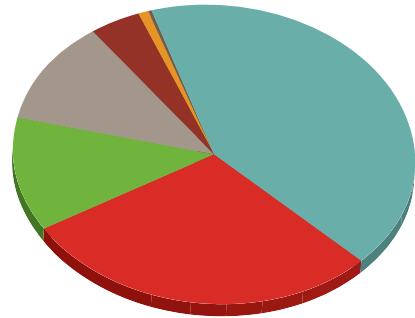
REDUCED-TO-CLEAR

Food which is reduced-to-clear does not bear the same societal or environmental cost as food which is dumped, though it is a significant financial cost particularly to retailers.

In tonnage terms, reduced to clear (17,000 tonnes) is far bigger than dumped waste (5,000 tonnes) and is dominated by the fruit and meat and poultry categories. A different picture emerges however when we analyse data of reduced-to-clear by product and value.

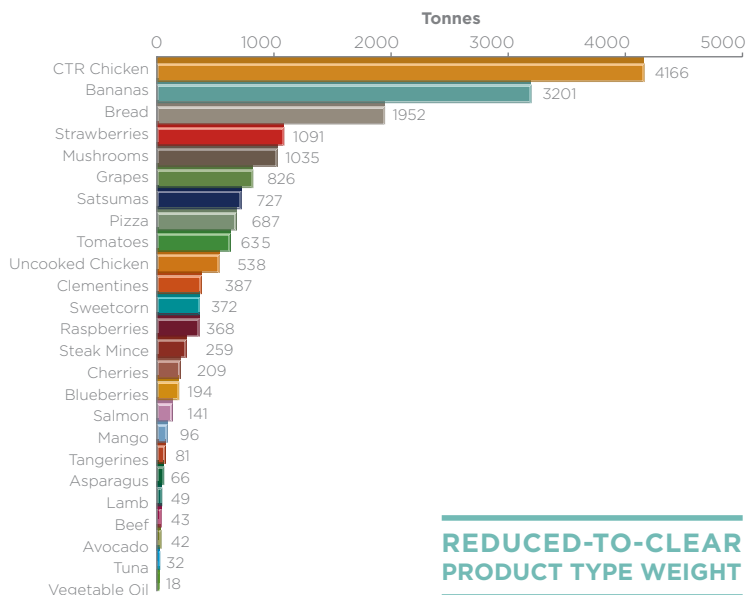
REDUCED TO CLEAR PRODUCT CATEGORY FINANCIAL VALUE- £thousand

Fruit	£7,221
Meat & Poultry	£5,054
Vegetables	£2,108
Bakery	£1,952
Other	£687
Fish & Seafood	£173
Oils	£18

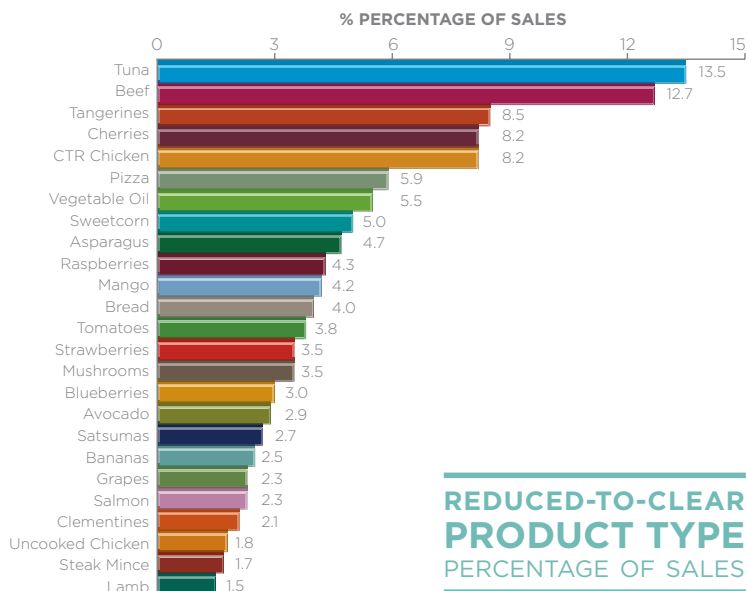


Delicatessen chicken alone accounts for almost 20% of the total. Then a variety of fruits and bread have a reduced-to-clear value of over £1 million each.

REDUCED-TO-CLEAR PRODUCT TYPE FINANCIAL VALUE- £thousand



Additional data on each of the product types is given in Appendix 1.



DIFFERENCES BETWEEN RETAILERS

The retailers who participated in this work have significantly different experiences with wastage for many of the product types. This is shown by the following “traffic light” charts of financial value.

The full report from PEC Partnership is available from INCPEN. It explains the “multiple of average” calculations of which these tables are based.

TOTAL WASTE

Their experiences are similar for nine of the products. All three retailers show red for bananas and green for asparagus, avocado, citrus, clementines, lamb, sweet corn, tuna, and vegetable oil.

Their experiences differ for the other sixteen products. Egg wastage for example is a highly ranked issue for one retailer but lower for the other two. The following tables show the same comparison for dumped and reduced to clear product types.

Rankings positions based upon multiple of average (value)

Coding

Ranking Position



1 - 5



6 - 10



11+

Grouping	Retailer 1	Retailer 2	Retailer 3
Asparagus			
Avocado			
Bananas			
Blueberries			
Bread			
Cherries			
Citrus			
Clementines			
CTR Chicken			
CTR Ham			
CTR Turkey			
Eggs			
Grapes			
Lamb			
Mushrooms			
Pizza			
Raspberries			
Salmon			
Steak Mince			
Strawberries			
Sweetcorn			
Tomatoes			
Tuna			
Uncooked Chicken			
Vegetable Oil			



These tables show the degree to which individual retailers experience different levels of severity of loss with the same product.

DUMPED WASTE

Grouping	Retailer 1	Retailer 2	Retailer 3
Bananas			
Blueberries			
Bread			
Broccoli			
Cherries			
Clementines			
CTR Chicken			
CTR Ham			
CTR Turkey			
Eggs			
Grapes			
Mushrooms			
Raspberries			
Red Pepper			
Salmon			
Satsumas			
Steak Mince			
Strawberries			
Sugar			
Sweetcorn			
Tomatoes			
Uncooked Chicken			

REDUCED-TO-CLEAR

Grouping	Retailer 1	Retailer 2	Retailer 3
Asparagus			
Avocado			
Bananas			
Beef			
Blueberries			
Bread			
Cherries			
Clementines			
CTR Chicken			
Grapes			
Lamb			
Mango			
Mushrooms			
Pizza			
Raspberries			
Salmon			
Satsumas			
Steak Mince			
Strawberries			
Sweetcorn			
Tangerines			
Tomatoes			
Tuna			
Uncooked Chicken			
Vegetable Oil			

SUMMARY AND CONCLUSIONS

1. Wastage in the retail supply chain occurs for many and varied reasons including mishandling, inadequate packaging, shelf life of products, over ordering, stock rotation issues, even incorrect weather forecasting.
2. This study identifies the main product categories and product types that suffer the greatest losses in the retail supply chain in terms of both weight and value.
3. Traditionally, it has been thought that shrinkage (i.e. losses due to theft, pricing/check-out errors etc.) was a greater issue than wastage through dumped or reduced-to-clear products. This study may show that the opposite is the case – though care needs to be taken in coming to a conclusion because retailers do not use consistent terms. Wastage accounts for 61% by value of product losses (reduced to clear alone is 43%) whilst shrinkage accounts for 39%, mainly (33%) through theft. If this is the case, wastage merits greater focus than it has been customarily given.
4. Waste is greatest in the fruit, vegetables, meat and poultry and bakery categories. Nine specific product items account for three-



quarters of the total wastage with delicatessen chicken, bananas, strawberries, raspberries, bread, grapes, mushrooms, cherries, blueberries, tomatoes and uncooked chicken being particularly noteworthy. But there is a very long “tail” of hundreds of products with wastes of under 0.2% of the total.

5. A different picture emerges when the data are analysed according to the percentage loss of a product's total value. Here, tuna experiences

the greatest loss (13.5%).

Delicatessen ham and turkey are both over 10% with cherries, delicatessen chicken, sweet corn and pizza all being in the 6-9% range. Even eggs are significant at almost 2% of product sales. But whereas tuna losses are mainly through the reduced to clear route, eggs (cracked / broken) invariably are dumped. Different products have different routes to wastage.

6. Each retailer suffers significantly different levels of wastage in many of the products covered in this study. More work is needed to better understand the complex reasons for such differences and to identify best practice.

7. Collection and analysis of data on wastage would be helped if

retailers had a consistent format to help define, measure and record such data.

8. This is the first study that has provided some hard data on the largest sources of waste in the retail supply chain. It has not identified where and why the waste occurs nor does it propose possible ways of reducing it. These issues require further study.

9. It is worth noting that the majority of the high wastage product types are typically sold both loose and pre-packed. Food sold from the delicatessen counter features highly. Few products that are sold only pre-packed appear in the top 20. It would therefore be worth exploring if packaging more of those sold loose would reduce waste.



APPENDIX

Data were available only for broad product types. It was not possible to identify how the product was prepared or how it was packed. For some categories, data were not available so the data rows have been excluded.



Bread

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	906	2	964	5	5.2	3
Reduced to Clear	1952	3	1767	5	4.0	12
Total Waste	2426	3	2241	5	4.3	11

Bread ranks very highly across all measures and has one of the highest percentages of product being dumped.



Delicatessen Chicken

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	236	6	660	6	1.3	10
Reduced to Clear	4166	1	5289	1	8.2	5
Total Waste	4222	1	5243	1	8.4	5

Delicatessen chicken is highest in both total and reduced to clear waste both in terms of weight and value.



Delicatessen Ham

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	79	12	217	3	11.5	1
Total Waste	44	21	719	15	11.0	2

Figures for dumping and percentage loss for delicatessen ham rank very highly.



Delicatessen Turkey

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	21	16	383	9	10.2	2
Total Waste	44	21	383	19	10.2	3

Although much less significant than the other delicatessen products, the percentage waste is very high and like ham, appears to be primarily dumped.

Salmon



	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	19	21	941	12	3.4	15
Reduced to Clear	141	17	1067	11	2.3	21
Total Waste	119	17	941	12	3.4	15

A substantial value of salmon is sold on a reduced to clear basis.

Tuna



	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Reduced to Clear	32	24	322	19	13.5	1

It is the percentage loss through sales as reduced to clear which brings tuna into these data sets.



Bananas

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	1853	1	1907	2	1.1	15
Reduced to Clear	3201	3	2416	3	2.5	19
Total Waste	3503	2	4054	2	2.5	18

Low percentage levels of waste on a high sales volume item can have a major impact on overall waste figures. As a result, both the weight and value of losses of bananas are relatively high with both dumping and reduced to clear having significant roles.



Strawberries

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	93	10	536	7	0.6	18
Reduced to Clear	1091	4	3410	2	3.5	14
Total Waste	1184	5	3945	3	3.9	13

The situation with strawberries shows reducing to clear as the main option for handling product rather than dumping.



Raspberries

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	18	18	194	17	0.9	17
Reduced to Clear	386	13	2097	4	4.3	10
Total Waste	386	10	2290	4	4.6	10

Like strawberries, reduce to clear is the preferred option for handling raspberries rather than dumping.



Grapes

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	218	7	1009	4		
Reduced to Clear	826	6	1447	6	2.3	20
Total Waste	931	6	1966	6	2.5	19

Grapes show a similar picture to raspberries and strawberries.



Cherries

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	8	22	99	21	1.3	11
Reduced to Clear	209	15	1346	7	8.2	4
Total Waste	217	13	1445	8	8.9	4

Cherries have a high financial loss through reduced to clear activities.



Blueberries

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	16	19	247	15	0.6	19
Reduced to Clear	194	16	1322	8	3.0	16
Total Waste	176	16	1319	9	3.2	16

Blueberries' high waste value relates to high product value. As with the other berries and soft fruits, reduced to clear is preferred rather than dumping.



Mangoes

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Reduced to Clear	96	18	248	25	4.2	11

Mangoes are included only because of the relatively high percentage of sales which are reduced to clear.



Uncooked chicken

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	236	6	660	6	0.3	31
Reduced to Clear	538	10	1114	10	1.8	23
Total Waste	568	8	1312	10	2.0	21

Even though the percentage of uncooked chicken which is wasted is relatively low, the high volumes sold ensure that it ranks high in waste terms.



Steak mince

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	14	20	86	22	0.3	22
Reduced to Clear	259	14	512	17	1.8	23
Total Waste	273	12	599	17	1.0	25

Steak mince is a low percentage loss.



Beef

Waste by Weight		Waste by Value		Percentage Loss of Sales	
Tonnes	Rank	£000	Rank	%	Rank

Reduced to Clear	43	22	289	23	12.7	2
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Beef ranks high in the percentage loss which is reduced to clear.



Lamb

Waste by Weight		Waste by Value		Percentage Loss of Sales	
Tonnes	Rank	£000	Rank	%	Rank

Reduced to Clear	49	21	306	22	1.5	25
Total Waste	49	20	306	25	1.5	24

Lamb has a low percentage loss but the high value of the product brings it into the rankings.



Vegetable oil

Waste by Weight		Waste by Value		Percentage Loss of Sales	
Tonnes	Rank	£000	Rank	%	Rank

Reduced to Clear	18	25	361	18	5.5	7
Total Waste	18	25	362	20	5.5	8

Vegetable oil's high percentage loss brings this product into the rankings.



Eggs

Waste by Weight		Waste by Value		Percentage Loss of Sales	
Tonnes	Rank	£000	Rank	%	Rank

Dumped	492	3	1926	1	1.6	6
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Any cracked/broken eggs are dumped together with all the other eggs in the pack hence the dumped value is very high.



Sugar

Waste by Weight		Waste by Value		Percentage Loss of Sales	
Tonnes	Rank	£000	Rank	%	Rank
430	4	320	12	1.3	13

Sugar's high weight of waste lost and dumped is presumably a result of leakage/breakage of the packs.



Pizza

Waste by Weight		Waste by Value		Percentage Loss of Sales	
Tonnes	Rank	£000	Rank	%	Rank
687	8	921	14	5.9	6

The large quantity and percentage of reduced to clear pizza may be indicative of a too short shelf life for chilled variants.



Mushrooms

Waste by Weight		Waste by Value		Percentage Loss of Sales	
Tonnes	Rank	£000	Rank	%	Rank
190	8	526	8	2.7	4
1035	5	1284	9	3.5	15
1225	4	1811	7	3.7	14

Mushrooms rank high in all three classifications of wastage. The delicate nature of the product makes waste reduction challenging but one with significant potential financial rewards.



Tomatoes

Waste by Weight		Waste by Value		Percentage Loss of Sales	
Tonnes	Rank	£000	Rank	%	Rank
262	5	346	10	1.5	7
635	9	948	13	3.8	13
897	7	1294	11	4.1	12

Tomatoes are a significant product for all waste classifications.



Sweetcorn

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	15	28	116	20	1.1	16
Reduced to Clear	372	12	851	15	5.0	8
Total Waste	302	11	729	14	6.8	6

The waste data for sweetcorn appears surprisingly high for a product which is not delicate or subject to rapid deterioration.



Broccoli

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	142	9	305	13	1.2	14

The appearance of broccoli within the results is driven by its high ranking within the dumped category.



Asparagus

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Reduced to Clear	66	20	312	20	4.7	9
Total Waste	66	19	312	23	4.7	9

The high percentage of waste brings asparagus into the rankings.



Red Peppers

	Waste by Weight		Waste by Value		Percentage Loss of Sales	
	Tonnes	Rank	£000	Rank	%	Rank
Dumped	19	17	124	19	1.4	8

Red peppers only feature because of their ranking within dumped products.

ABOUT INCPEN

INCPEN is the Industry Council for research on Packaging and the Environment. We are a not-for-profit organisation dedicated to analysing the environmental and social effects of packaging and packaged goods.

Established in 1974, our members include raw material suppliers, packaging manufacturers, branded goods suppliers and retailers. Together they represent all the main elements of the packaged goods supply chain.

They collaborate to research issues, optimise and improve packaging,

minimise the environmental footprint of packaged products and so help consumers live more sustainably.

INCPEN has been demonstrating that the main role of packaging is to reduce and prevent waste by better protecting and preserving the contents of the pack from damage or spoilage. We commissioned a major study of the role of packaging in the **Environmental Impact of Packaging in the UK Food Supply Chain** from Dr Jan Kooijman, a Dutch expert on the food supply chain.

Our **Table for One** publication demonstrated that packaging protects ten times more resources than it uses.



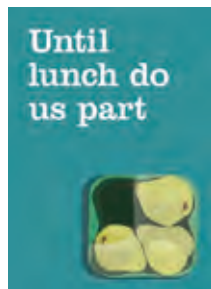
We are a partner (with Kent Resource Partnership, WRAP, the Food and Drink Federation, The Packaging Federation and the British Retail Consortium) in the **Fresher for Longer** campaign designed to help consumers minimise food waste in the home.

Our **Green Kitchen; Recipes for a Better Planet** publication gives consumers recipes and advice on how to shop, store and cook food in an energy-efficient, environmentally responsible way.

Our campaign “**The Good, the Bad and the Spudly**” is a social media microsite which explains that, contrary to popular belief, packaging products does prevent waste and is a key element in ensuring a sustainable future.

Visit INCPEN at www.incpen.org for more information on our members, activities and on the sustainability benefits of packaging and packaged goods and for links to our research, publications and campaigns.

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Fresher for Longer



The Green Kitchen



The Good, the Bad and the Spudly

INCPEN MEMBERS

Ball • Boots • Britvic • Cadbury • Coca Cola • Colgate Palmolive
Consol Glass • CROWN • Diageo • DOW • DS Smith • Duracell
Gillette • Green & Black's • LINPAC Group • Marks and Spencer
Mondelez • Nestlé UK • Procter and Gamble • Red Bull • Rexam
RPC • Sainsburys • Sealed Air • Tesco • Uflex • Unilever • Warburtons



The Industry Council for research
on Packaging and the Environment
SoanePoint, 6-8 Market Place
Reading RG1 2EG

Tel: +44 (0)1189 255 991
Email: info@incpen.org

www.incpen.org

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