

Extending product life prevents food waste

Sainsbury's and one of its suppliers, Cranswick, conducted a business experiment to identify, in as controlled a way as possible, if there is a direct relationship between increasing product life and reducing the amount of waste produced in store.

The benefits realised by this experiment include:

- giving consumers more product life¹ on the chosen product reduces store waste costs (without compromising safety or quality) by 75% per day;
- the waste prevention benefit of extending product life can be approximated through a simple relationship and applied more widely to other products; and
- on-shelf availability improved as product life was increased.

'These results are very significant for us, the ability to prevent waste by adding days to life is important and a very positive development, one we would like to extend to other products.'

Stuart Lendrum
Head of Ethical Sourcing,
Sainsbury's

¹ The reduction in waste reflects an increase from four/five days to nine days of available life for consumers.

Product selection

The product chosen for the experiment was a pack of cooked chicken, which was monitored in 268 Sainsbury's stores. This product has an 11-day product life of which nine days are nominally available on the shelf to Sainsbury's shoppers.

A waste baseline was established for the product using data from 2013. The trial commenced on 26 March 2014 and ran until 2 November 2014.

Method

At the start of the experiment, the available life remaining on the product was reduced to four to five days. Then, during the course of the experiment, it was progressively increased to seven, eight and finally back to nine days. In this way there was no conflict with product safety or quality criteria.

At each stage of the experiment, Sainsbury's compared the impacts on waste, availability and sales with the 2013 baseline and with the previous period(s). There was a need to allow for dated stock from the previous period to 'sell through' to assess the impact of the date change. Various regression models were fitted to the data to develop predictive capability.

Benefits

Figure 1 shows waste (by unit of product) for each stage of the 2014 experiment and that for 2013. The blue line shows waste levels during the experiment. This line tracks significantly above the red line, which shows the waste level for 2013. It demonstrates that shortening available life for shoppers caused a considerable jump in waste following the clearing out of old stock (with a nine-day life) from shelves.

Extending available life in three incremental steps (that is, four/five days to seven, eight and then nine days) reduces levels of waste progressively, such that at the end of the trial they were back to the levels for 2013. The trend line (dotted blue line) shows a continued decline, which could be used for predictive purposes.

We were unable to establish a statistically robust predictive model because there are many other influences on waste that are unrelated to product life. However, we did demonstrate that, for each day that the product life was extended, the cost of waste was reduced, in terms of pack numbers, this represented a waste reduction of 4% for each day. Figure 2 shows the relationship between the disposal value and available life established by the trial.

[back](#) : [forward](#)

Sainsbury's
page 2

[Introduction](#)

[Product selection](#)

[Method](#)

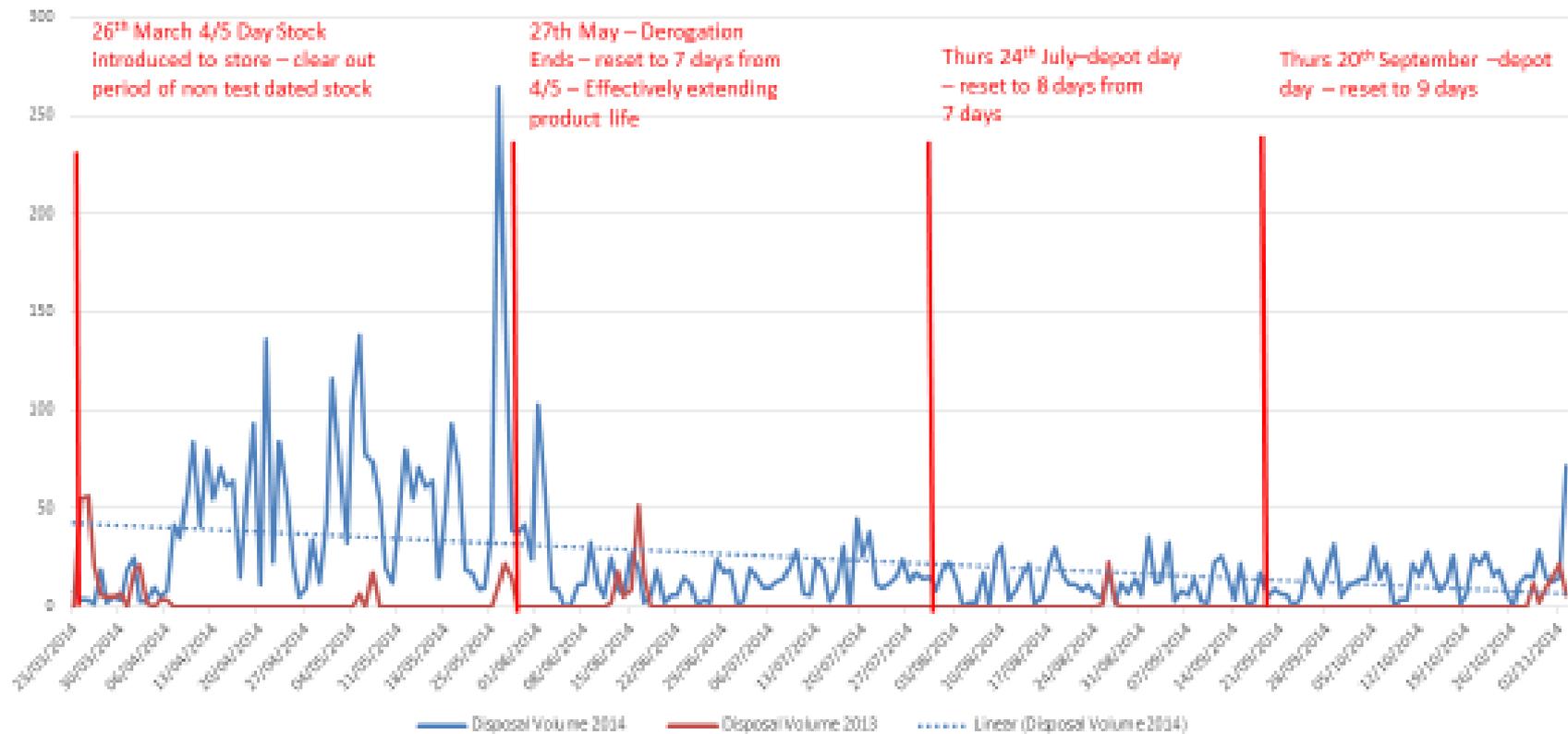
[Benefits](#)

[Figure 1](#)

[Figure 2](#)

[Figure 3](#)
[Other benefits and
replication potential](#)
[Next steps](#)

Figure 1: Trends in waste over time



[Figure 1](#)

[back](#) : [forward](#)

[Introduction](#)

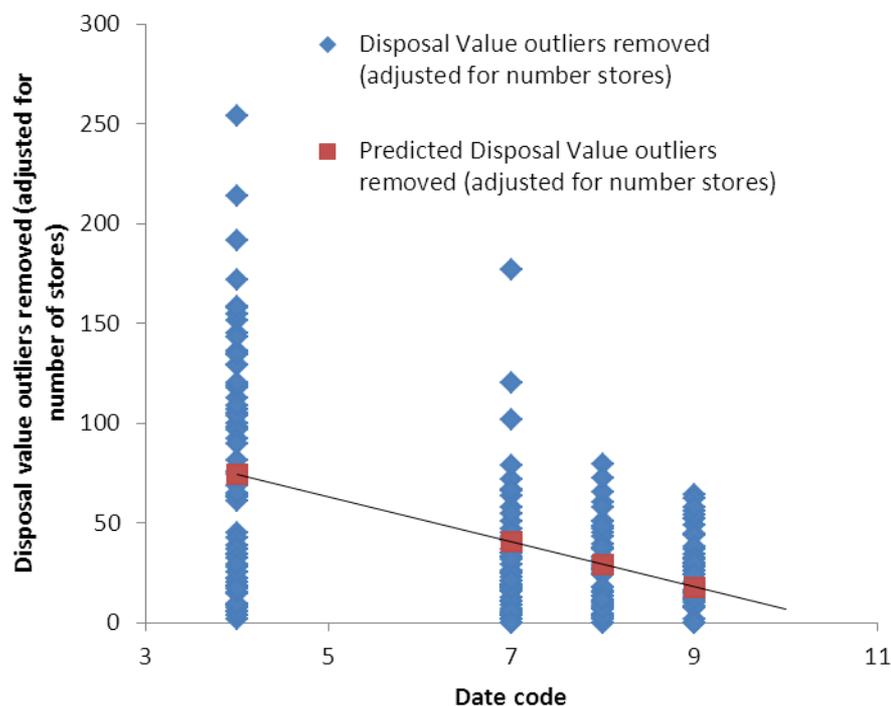
[Product selection Method Benefits](#)

[Figure 2](#)

[Figure 3 Other benefits and replication potential Next steps](#)

Sainsbury's page 3

Figure 2: Date code line fit (excluding outliers)

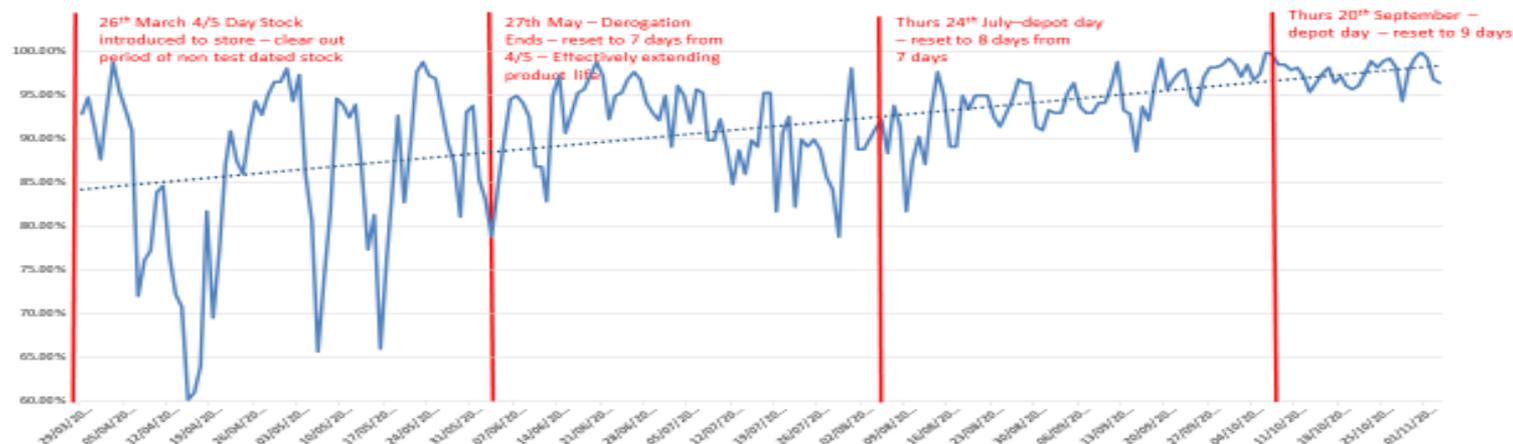


In the analysis of the data shown in Figure 2, a small number of disposal 'outliers' were removed. These are extreme events where, for example, the quantities disposed of might be the result of extreme weather. When these are removed, there is a better fit for statistical models that approximates to 4% of waste (disposals) or approximately six units saved to disposals per date-code-change increment.

Sainsbury's and Cranswick also tracked the trend in availability across the 268 stores. Availability is a measure of whether or not the product is on the shelf and, hence, available for sale. Low levels of availability lead to reduced sales as shoppers look elsewhere for their requirements. Figure 3 shows the availability of the product over the period of the experiment.

Figure 3 shows that the initial change in available life led to wide swings in availability resulting some stores running out of stock. Extending available life led to a steady improvement in availability – to levels above 95% by the end of the trial.

Figure 3: Trends in percentage on-shelf availability



Other benefits and replication potential

The experiment helped Sainsbury’s realise other benefits including:

- the results of the experiment gave a strong indication that the waste prevention and on-shelf availability benefits could apply to many other relatively short shelf life products with the potential to prevent many tonnes of food waste;
- there are many ways in which product life can be extended without compromising product safety or quality and without changing the products or packaging; and

- further opportunities to extend product life through packaging and/or changes to the ingredients and processing methods.

Next steps

The report on product life provides further data and suggestions on how retailers can benchmark their performance, including five low or no-cost ways to challenge product life without product or packaging changes.

[back](#) : [forward](#)

[Figure 3](#)

[Other benefits and replication potential](#)

[Next steps](#)

Sainsbury’s page 5

[Introduction](#)

[Product selection](#)

[Method](#)

[Benefits](#)

[Figure 1](#)

[Figure 2](#)

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[back](#) : [home](#)