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The effect of date labels on willingness to consume dairy products: Implications for food waste reduction

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ABSTRACT

In the context of national and cross-national efforts to reduce the quantity of food wasted by consumers, there is growing interest in the role of date labelling. Recent proposals by policy makers and the food industry to address dairy product waste have included streamlining date-label application and encouraging the use of best-before dates where possible. In order for these measures to have a positive impact on food waste, consumers must not only know the difference between date types, but also be prepared to act on this information and consume products after the best-before date. Through a survey of 548 Scottish consumers we investigated the relationship between product type, date type, reduced labels and willingness to consume (WTC) dairy products in relation to the both the best-before date and the use-by date. We also examined the factors associated with different levels of WTC products in relation to the best-before date including knowledge, risk perceptions and trust. Our results suggest that on their own, the effect on food waste of applying best-before dates to dairy is likely to be small. In order for such changes to be effective, consumer communication that goes beyond improving expiry-date knowledge and addresses the multifaceted nature of related risk perceptions and conceptions of date-label trust will be required.

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1. Introduction

In the context of national and cross-national efforts to reduce the quantity of food wasted by consumers in developed countries (Gustavsson et al., 2011; High Level Panel of Experts (HLPE), 2014; Stenmarck et al., 2016), there is a growing interest in the role of date labelling (Milne, 2012; Newsome et al., 2014; Wilson et al., 2017; WRAP, 2011). Recent proposals to address food waste have included streamlining date-label application and encouraging the use of best-before dates where possible (The Consumer Goods Forum, 2017; WRAP, 2017a). Working with companies to increase the number of products with best-before dates could give, “consumers the confidence and option to make use of products after the best-before date” (WRAP, 2017a, pp. 9), thereby helping to reduce household food waste. At present there is little evidence on the effectiveness of efforts to influence consumer behaviour and avoid unnecessary food waste through date labelling (European Commission, 2018).

In the UK, dairy products, particularly yoghurt and cheese, have been identified as product categories which are often unnecessarily given a use-by rather than a best-before date (Better Regulation Delivery Office, 2011). Date labelling in the UK is regulated at the EU level: all food must have either a minimum date of durability (translated as best-before date in the UK) or a use-by date, unless they are listed as one of the fresh or highly durable products that are exempt (Regulation (EU) No. 1169/(2011)). The minimum date of durability is a measure of food quality, “the date until which the food retains its specific properties” (Regulation (EU) No. 1169/2011; p26); the use-by date is a measure of food safety, where “food shall be deemed to be unsafe in accordance with Article 14(2) to (5) of Regulation (EC) No 178/2002” (Regulation (EU) No. 1169/2011; p35). It should be also be noted that food safety is also dependent on compliance with specified storage conditions throughout the supply chain regardless of the date label applied (Newsome et al., 2014).

Determination of labelling requirements rests with food manufacturers (Department for the Environment, Food, and Rural Affairs (defra), 2011). As a consequence there is variation in how best-before and use-by date labels are applied (European Commission, 2018). Studies have found that some manufacturers of dairy products apply use-by dates for reasons broader than microbiological

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specifications outlined in EU regulation, including retailer specification, product quality deterioration, and desire for consistency across a range (Better Regulation Delivery Office, 2011; European Commission, 2018). This evidence suggests that date labelling decisions are not always made on the basis of food safety: use-by dates are the default position (WRAP, 2017b). While the decision on labelling may have fine margins (Department for the Environment, Food, and Rural Affairs (defra), 2011), recent work on hard cheese with the dairy industry in the UK, has highlighted the opportunity for change: the proportion of products labelled with best-before dates increased from 75% of products sold in the UK in 2009 to 97% in 2015 (WRAP, 2017a).

In the UK, dairy products represent about 10% of avoidable household food waste (WRAP, 2013). Equivalent estimates are not available for the EU as a whole, though Gustavsson et al. (2011) estimated that 7% of dairy products were wasted by consumers in the wider Europe region. In the UK, 54% of milk, 78% of yoghurt and 79% of cheese are reportedly wasted because they pass their expiry date, versus other reasons such as too much being served (WRAP, 2013). Furthermore, some research suggests that yoghurt pots are often thrown away are unopened (WRAP, 2010); for dairy products in general it has been suggested that the date label is important in making disposal decisions. (WRAP, 2015).

Evidence of the role of date labels across the whole EU is not available at present (European Commission, 2018), though household food waste studies from various Member States indicate that date labels play an important role in the waste of dairy products and that misconception of the best-before date as an indicator of food safety is an issue. A summary of studies from the Netherlands found that dairy products made up 26% of household food waste, with 61% of people giving best-before date expiry as their reason for disposal (Netherlands Nutrition Centre, 2014). A summary of studies from across the Nordic countries found that a lack of date label understanding contributed to food waste, in particular that products labelled with a best-before (such as yoghurt and sour cream) were most frequently reported as being thrown away because the expiry date had passed (Møller et al., 2014). Overall these findings indicate that for the outlined date labelling changes to contribute to reducing household food waste, consumers must first know the difference between best-before and use-by dates, but must also act on this knowledge and be prepared to consume products after the best-before date.

A number of studies have highlighted consumer misunderstanding of date labels as an issue and have discussed the implications for household food waste (TNS European Behaviour Studies Consortium, 2014; van Boxstael et al., 2014; Toma and Font, 2017). However, few studies have investigated the association of factors beyond knowledge and use of date labels (European Commission, 2018) and explored personal factors such as biospheric values associated with consuming products after the best-before date (Hooge et al., 2017). Studies have investigated the association of factors such as product type, expiry date based pricing, and other product characteristics on consumer interaction with date labels outside the home, in particular willingness to pay (WTP) (Tsiros and Heilman, 2005; Theotokis et al., 2012) and willingness to waste (WTW) (Wilson et al., 2017). However, there are differences in how consumers consider suboptimal foods inside and outside the home, and further research is required to distinguish which factors are important in each context (Hooge et al., 2017).

This study adds to the existing literature by investigating how consumers interact with date labels at home when making a decision whether to consume a product. First, it explores whether WTC dairy products varies by date type (best-before or use-by) as well as product type (milk, cheese and yoghurt), and whether the pres-

ence of a reduced label affects WTC. Second, it differentiates itself from previous literature by investigating factors associated with consumers' WTC dairy products in relation to the best-before date, using yoghurt and cheese as examples: in addition to knowledge of the best-before date, it explores how consumers' perception of food-related risk and trust in date labels are associated with their WTC yoghurt in relation to its best-before date. These factors were chosen because the wider literature on the use of food labels and food-safety information highlights the importance of perceived risk, trust in information and labels, as well as food system actors (Frewer et al., 1996; Hobbs and Goddard, 2015; Lobb et al., 2007; Tonkin et al., 2016a; Tonkin et al., 2016b). We hope our findings will contribute to building the evidence base on consumer engagement with date labels, and on efforts towards food waste reduction (European Commission, 2018).

2. Background and hypotheses

2.1. Association between product type, date type, reduced labels, and WTC

A number of studies have explored the association of product type on WTC a range of products, including dairy products, on or after the expiry date (Broad Leib et al., 2016; WRAP, 2011; van Boxstael et al., 2014). As the results reported by these studies were descriptive in nature, tested a number of variants of date label phrasing e.g. "use-by end of" (WRAP, 2011) and Broad Leib et al. (2016) study was US based it is valuable to test whether willingness to consume for our respondents were significantly different by date or product type.

First we compare products holding the date type constant. Milk is not included in the best-before condition because the majority of milk sold in the UK is fresh and currently carries only use-by dates.

H1. In the use-by date condition we hypothesise that respondents' WTC yoghurt will be lower than respondents' WTC milk and WTC cheese will be higher than both WTC both milk and yoghurt.

H2. In the best-before date condition we hypothesise that respondents' WTC yoghurt will be lower than respondents' WTC cheese.

Second we compare WTC for different date types holding the product type constant. Again milk is not included because the condition of milk with a best-before date would not be realistic for consumers in the UK.

H3. In the yoghurt condition we hypothesise that WTC yoghurt with a use-by date will be lower than respondents' WTC yoghurt with a best-before date.

H4. In the cheese condition we hypothesise that WTC cheese with a use-by date will be lower than WTC cheese with a best-before date.

Expiry-date-based pricing, and the use of a reduced label to indicate this, is a common approach used by food retailers (Aschemann-Witzel, 2018; Tsiros and Heilman, 2005; Theotokis et al., 2012). Willingness to pay (WTP) for a product has been shown to decrease as the expiry date approaches (Tsiros and Heilman, 2005), since estimated likelihood of consumption (as well as perceived quality) is an important factor in consumers' decisions to purchase food close to the expiry date (Aschemann-Witzel, 2018). It is therefore of interest to test whether, once reduced items are brought into the home, the presence of the reduced label is still pertinent (e.g. it prompts them to think about its approach-

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