Food Quality and Preference 63 (2018) 119–128

Contents lists available at ScienceDirect

Food Quality and Preference

journal homepage: www.elsevier.com/locate/foodqual

Consumer perception and preference for suboptimal food under the emerging practice of expiration date based pricing in supermarkets

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ARTICLE INFO

Keywords:
Food waste
Suboptimal food
Expiration date based pricing
Product perception
Retailing
Consumer choice

ABSTRACT

Consumers have been found to majorly prefer 'optimal' food over 'suboptimal' when purchasing food. To provide an incentive for consumers to select suboptimal food and thus decrease food waste in the supply chain, expiration date based pricing is suggested and increasingly applied. However, it is unclear which contextual, individual, and product-related factors impact consumer likelihood of choice and thus acceptance of the practice in the long run. The study aimed at exploring the effect of communicating different motives for purchase, the product being organic, familiarity with the practice, individual preferences, and product-related factors. An online survey experiment among 842 Danish consumers realistically mimicked the current market context. Findings reveal that neither communicating budget saving or food waste avoidance nor the product being organic has an influence. However, there is a gender effect when the practice is communicated as a food waste avoidance action. Consumer's familiarity with the practice has a significant influence, as has the individual giving importance to the price criterion, age, and education. Food category differences are explored, showing that familiarity and the interaction with gender is observed for milk in particular. Overall, perceived quality and estimated likelihood of consumption at home majorly determine likelihood of choice. Consumer acceptance of expiration date based pricing of suboptimal food can be increased through furthering consumer familiarity with the practice, improving perceived quality and providing tips to ensure consumers are confident to be able to use the entire food at home.

1. Introduction

1.1. Food waste issue and consumers

Food waste has developed into a topic of societal concern and debate in the past five to ten years. Around a fourth (Kummu et al., 2012) to a third (FAO., 2013) of food is wasted between production on the field and consumption in the household or in restaurants and canteens. This increases to close to a half, once over-nutrition – that is, consuming more than needed, which some definitions include as 'food waste' (Parfitt, Barthel, & Macnaughton, 2010) – is also accounted for (Alexander et al., 2017). A certain degree of surplus food is needed to secure food supply (Papargyropoulou, Lozano, Steinberger, Wright, & Ujang, 2014), and not all waste is avoidable in economically feasible manner (Katare, Serebrennikov, Wang, & Wetzstein, 2017). Nevertheless, food waste constitutes inefficient use of scarce natural resources (Garnett, 2011) and causes further emissions during disposal (Bernstad Saraiva Schott & Andersson, 2015; Cuéllar & Webber, 2010; EC, 2010). In addition, food waste is regarded as a moral problem given the inequality in access to food across the globe (Aschemann-Witzel, Hooge et al., 2017) and the rising problem of food security (Foley et al., 2011; Godfray et al., 2010). In developing countries, the greater share of food waste occurs in the consumption phase (Parfitt et al., 2010). It has been estimated that consumers waste between 10 and 30% of the food that they purchase (Aschemann-Witzel, Hooge et al., 2017; Buzby & Hyman, 2012). This holds in particular in urban areas (Secondi, Principato, & Laureti, 2015) and for consumers who are younger or from single-households (Fusions., 2013). Thus, food waste is both an environmental and a social issue that needs to be tackled to achieve sustainable development of the food supply chain (Foley et al., 2011; Garnett, 2011), and reduce economic loss in the supply chain (Buzby & Hyman, 2012).

Tackling the issue needs the involvement of multiple stakeholders to devise the most efficient approaches to curb food waste (Garrone, Melacini, & Perego, 2014). Such stakeholders are producers (Lee, Sönmez, Gómez, & Fan, 2017), supply chain actors such as retailers (Cicatiello, Franco, Pancino, & Blasi, 2016), policy makers, food caterer (Sonnino & McWilliam, 2011), as well as actors in public-private partnerships (Halloran, Clement, Kornum, Bucatariu, & Magid, 2014). Retailers in particular have been heavily criticised for contributing to food

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http://dx.doi.org/10.1016/j.foodqual.2017.08.007
Received 31 May 2017; Received in revised form 26 July 2017; Accepted 26 August 2017
Available online 30 August 2017
0950-3293/

wastage (Stuart, 2009). Interestingly, though, the actual share of food waste caused at the supermarket itself is relatively small (EC, 2010). However, retailer decisions in sourcing crucially influence wastage both up- and downstream of the supply chain. Such decisions are for example aesthetic product specifications or contractual agreements (Eriksson, Ghosh, Mattsson, & Ismatov, 2017) and decisions in in marketing to consumers as e.g. removal of suboptimal items from display (Loebnitz, Schuitema, & Grunert, 2015) or pricing strategies to encourage greater purchase volume (Quested, Marsh, Stunell, & Parry, 2013). Furthermore, retailers are the supply chain actor most visible for the end-consumer, and consequently, their activities and communication influences consumer's knowledge and attitude towards the topic of food waste, or the perception of food products as such or as a result of store image (Lombart & Louis, 2014). From a food policy maker's point of view, the fact that the retail sector is highly concentrated means that there are few stakeholders to approach (Gruber, Holweg, & Teller, 2016), and doing so might be an efficient policy strategy to alter consumer acceptance or perception of suboptimal food.

1.2. Reduced price of suboptimal food to tackle food waste

From among the factors causing food waste (Halloran et al., 2014) as well as the suggested measures to tackle food waste, pricing has emerged as a particular topic of interest (Aschemann-Witzel, de Hooge, Amani, Bech-Larsen, & Oostindjer, 2015; Gruber et al., 2016). Pricing has been used to sell suboptimal foods, which are foods visually or in any other way deviating from the 'optimal' in consumer's eyes, amongst others by being close to the expiration date (de Hooge et al., 2017), on which the current study focuses. It has been found that suboptimal food is hardly accepted in a supermarket context, but that consumers consider choosing it when at a reduced price (Aschemann-Witzel, Jensen, Jensen, & Kulikovskaja, 2017; de Hooge et al., 2017). In fact, it has long been a common practice of retailers to apply expiration date based pricing (also called EDBP) of foods (Tsiros & Heilman, 2005). It means that the price is reduced according to the length of time to the expiration date of a perishable item (Theotokis, Pramatari, & Tsiros, 2012). However, this strategy has received a renewed interest and a new reason for application as a food waste avoidance strategy in retailing (Halloran et al., 2014). Studies find that the majority of food waste at the retail stage is linked to expiration date (Garrone et al., 2014). Taking the management tool of the 'food waste hierarchy' for guidance, an approach focusing on prevention of food waste should be given priority (Papargyropoulou et al., 2014), and this is the case for expiration date based pricing of foods that otherwise might be wasted or needs to be dealt with as unsold surplus food (Garrone et al., 2014). In expiration date based pricing, the food item nearing its expiration date is still located in the store. Therefore, its 'degree of recoverability' is high, as intrinsic recoverability (the quality inherent to the product) is high and management intensity of recovery is low (Garrone et al., 2014).

1.3. Role of consumer behaviour for suboptimal food acceptance and food waste reduction

However, successfully offering suboptimal food at reduced prices requires consumer's favourable perception of the items and consumer acceptance. Food consumers are influenced by a range of food quality dimensions, amongst them 'self-centred' aspects of price and health (Grunert, 2007) but also 'altruistic' motives such as sustainability (Sautron et al., 2015). Consumers might choose to buy price reduced foods that are close to the expiration date and thus 'suboptimal foods' due to two main reasons: firstly, the self-centred economic reason of saving budget, and secondly, the altruistic and ethical reason of contributing to food waste avoidance. In addition, their concerns about food safety (Tsiros & Heilman, 2005) or their assessment of quality (White, Lin, Dahl, & Ritchie, 2016) can be expected to play a role for likelihood of choice, and there might also be an interaction with other favourable product characteristics, such as organic food quality. Moreover, their familiarity with the food marketing practice and in this connection the consumer trust in the respective retailer's good intentions (Lombart & Louis, 2014) might also be of importance. Thus, the way the price reduced suboptimal food is presented in terms of communicating its added value to the consumer, whether the item in question offers another favourable characteristic such as 'organic', or a consumer's familiarity with the practice of offering such price reduced suboptimal foods, might be of relevance for likely choice.

When consumers choose and purchase suboptimal food in the store, this action reduces food waste only under two circumstances: firstly, the suboptimal food would otherwise have been disposed of by the retailer and not donated or re-inserted into the food supply chain in some other way (Garrone et al., 2014). Secondly, the suboptimal food is actually used by the consumer in the household, and not fully or partly disposed of as consumer household food waste (Aschemann-Witzel et al., 2017). However, even when few consumers choose and purchase suboptimal food in the store, this does not necessarily mean suboptimal food items are wasted, because it also depends on the quantity each consumer purchases – one consumer buying a whole batch of suboptimal food would be enough to reduce the waste. Nevertheless, the average likely choice across consumers can be regarded as an indicator of potential food waste avoidance in store. This holds in particular for countries with an average small household size, as in North-western Europe.

1.4. Research objectives

On this background, the study aimed to explore the factors that influence acceptance of expiration date based pricing of suboptimal food. In Denmark, this practice has become standard in all major retail chains by applying stickers to the suboptimal food items in store, but offering foods close to the expiration date at reduced prices is also done in other European countries. However, the approach to communicating the action to consumers varies in the different store contexts in terms of the motives appealed to. Furthermore, little is known about the drivers of individual consumer choice for these items. An online experimental survey is used to explore the effect of different communicational approaches under controlled conditions, while external validity under the experiment is maximised by realistically mimicking the actual store context. The research aims are to explore the effect of firstly, variations in communication on the stickers (appealing to economic versus ethical reasons and motives), secondly, suboptimal foods being organic or not, as well as thirdly, analyse the role of familiarity with the practice. The findings can contribute to the understanding of the relation between the individual consumer, the product and the store context, and allow to derive implications for retailers and policy makers seeking to improve efficiency of expiration date based pricing of suboptimal food.

2. Consumer perception of 'suboptimal' food in dependence of price

Consumer choice decisions and the product value perception is a result of the interaction between the perceived value in terms of economic, functional, and psychological benefits, and the resources that are needed in order to obtain the benefits, as e.g. money, time and effort (Schiffman & Wisenblit, 2015; Zeithaml, 1988). Of particular relevance is the relation between quality and price (Völckner & Hofmann, 2007). When consumers perceive the value or quality to decrease, as they do when the product shows cosmetic damage or the expiration date is approaching, their willingness-to-pay diminishes (Tsiros & Heilman, 2005; Yue, Alfnes, & Jensen, 2009). Vice versa, it is also known that reduced prices lead consumers to assume that the quality must have decreased (Grewal, Krishnan, Baker, & Borin, 1998). This negative inference might have a negative impact on store image, perception of the brand and future purchase intentions (DelVecchio, Henard, & Freling,