

Promoting food for the trash bin? A review of the literature on retail price promotions and household-level food waste

Results

Articles that found a positive relationship between price promotions and food waste

Delley and Brunner (2017) aim to understand attitudes, perceptions and behaviors of Swiss consumers toward food waste and to provide targeted suggestions for an effective solution of the food waste problem. To achieve their goal, the authors utilize a postal survey of a non-representative sample of 681 German- and French-speaking Swiss residents. Delley and Brunner (2017) measure food waste generated by households by asking participants to indicate the amount of food they waste during an average week for an array of food categories. This estimation takes place for a subset ($n = 506$) of the original sample due to inconsistent and missing responses. The authors thereafter convert food waste portions per food category into grams and create an aggregate measure of food waste per household, per week. Price promotions are operationalized with four statements where the respondents have to indicate their level of agreement on a 6-point Likert scale using the end points 1=do not agree at all, and 6=completely agree. The statements are based on previous research, and the authors utilize them in order to measure price and discount-driven food-shopping behavior in households. An example of a statement is: 'I get inspired by sales and buy food that was not initially planned'.

The results indicate that one particular consumer segment (out of a total of six that the authors identify) is very price- and discount-driven, and it produces a high, albeit not the highest among the identified clusters, amount of food waste per household: this segment is 'short-term'-oriented consumers, who comprise approximately 21 % of the Swiss population. Contrary to that segment, the cluster of consumers characterized as 'conservative,' who are also very price- and discount-driven in

their shopping routines, tend to report little food waste in their households. The conclusion of the study by Delley and Brunner (2017) points to the inference that price discounts do not have a universal impact on food waste but rather that the impact of price discount on the production of food waste is conditional on the type of consumer who utilizes price discounts in his or her shopping routines.

Mondéjar-Jiménez, Ferrari, Secondi, and Principato (2016) use the framework of the Theory of Planned Behavior with the aim of investigating the relationship between individual habits, attitudes towards food waste, and ‘addiction to marketing and sales strategies’ with regard to consumers’ food waste behavior. The operational definition of food waste that Mondéjar-Jiménez et al. (2016) use in their study comprises a group of behaviors the authors consider positive (correct) towards food waste. Accordingly, consumers who comprehend expiration dates, use left-overs, and use a shopping list exhibit positive behavior towards food waste. Price promotions are operationalized as ‘marketing/sale addiction’ with three items enquiring about participants’ inclination to purchase unnecessary items as a result of food packaging as well as about the layout of the products and special offers in supermarkets. Participants are asked to indicate their level of agreement with the survey questions on a 5-point Likert scale, with end points 1 = strongly disagree, and 5 = strongly agree.

The authors utilize a survey instrument administered to a non-representative sample of 380 youths in Italy and Spain. Their findings indicate that ‘marketing and sales strategies’ promoted by food retailers have a direct and significantly negative effect on consumers’ food waste behavior; the authors also emphasize the importance of the role of retailers in preventing the generation of food waste.

Setti, Falasconi, Segre, Cusano, and Vittuari (2016) aim to provide insights into the relationship between income and household food waste behaviors; they utilize an online survey that they administer to a representative sample of 1,403 Italian consumers. The authors measure food waste within five product typologies: Fresh bread, cheeses, yogurt, fresh vegetables, and fruits. Respondents have to indicate how often they throw away leftover food on a frequency scale ranging from ‘Nearly

every day/3-4 times a week', to 'Less than once a week/rarely'. The authors use a single item to inquire about the frequency with which consumers take advantage of special offers (often/sometimes/rarely).

The findings by Setti et al. (2016) reveal that the overwhelming majority of consumers purchase their food when special offers are available (99 %). However, purchases when special offers are available do not impact the amount of food waste for all food products but rather contribute to increased amounts of food waste for particular categories: cheeses, yogurt and fresh vegetables.

Schmidt (2016a) applies an experimental approach in her study, which aims to increase the likelihood of food waste prevention in households by improving the self-reported performance of food-waste-prevention behaviors of household members. Thus, the author a priori assumes that retail price promotions bring about increased food waste.

To achieve this aim, the author administers a survey instrument at two time points to a non-representative sample of 217 consumers in Germany. Thereafter, the author divides the sample into two groups, applies an intervention with informational material containing action knowledge using a public commitment and a goal-setting technique for one of the groups, and repeats the procedure at a second time point. Schmidt (2016a) operationalizes food waste with a battery of eleven items that represent food-waste-prevention behaviors on a 5-point Likert scale ranging from 1=almost never to 5=almost always. Price promotions are operationalized with two items, with the answer to the second item being conditional on the answer to the first one. The author first inquires whether respondents spontaneously buy more than they actually need, and in the case of an affirmative response, she inquires about the reasons for doing so. Among the options for answering, Schmidt (2016a) includes the option 'special offers / discounts (e.g., 'Take 3, pay for 2!')

The results of the study indicate that after the intervention, improvements are observed with regard to avoiding impulsive purchases and buying excessive unnecessary food due to special offers. Two outcomes (avoiding impulsive purchases/buying more food than currently necessary due to special

offers) are characterized by the lowest baseline ratings compared to other food-waste-promotion behaviors ($M_{t1}=2,76$, $SD=0,94$). After the intervention, the same results receive a higher average score for both the experimental group ($M_{t2}=3,55$, $SD=0,89$) and the control group ($M_{t2}=3,21$, $SD=0,98$). As a result of the intervention study, the author concludes that measures can be implemented to remind consumers that susceptibility to price promotions while shopping can lead to increased food waste.

In a subsequent study, Schmidt (2016b) administers an online survey at three time intervals; the aim is to create an instrument that measures self-reported behaviors that relate to food waste. The author bases the selection of the questionnaire items on previous research and a-priori assumes that the included items antecede food-waste behavior. Thus, the author does not measure food waste behavior per se but rather investigates, with the use of exploratory factor analysis, whether the thesis that the included items indeed comprise core food waste factors consistently holds true. The measurement of price promotions takes place in an identical fashion to Schmidt (2016a).

The results indicate that a factor that comprises behaviors related to spontaneously purchasing food items due to promotional activities, e.g., special offers and discounts, appears consistently.

In their recent study, Ponis, Papanikolaou, Katimertzoglou, Ntalla, and Xenos (2017) aim to investigate the effects of, among others, intensive promotion-shopping on food waste generation. The authors administer an online survey to a non-representative sample of 500 households in Greece and operationalize food waste with one item referring to the total amount of food waste and six items on the waste of specific food categories: 1) fruits, 2) vegetables, 3) bread and bakery, 4) milk and dairy, 5) meat, fish and eggs, and 5) rice, pasta and potatoes. Participants are asked to state the degree of the food waste they produce on a 7-point Likert scale with end points 1=not at all to 7=extremely much. Moreover, Ponis et al. (2017) include a battery of 7 items that, based on the literature, relate to potential causes of avoidable food waste, e.g., food that has been forgotten in the cupboard past its expiration date and is therefore discarded, and they ask participants to state the frequency of such

food-waste-promoting occurrences on a 7-point Likert scale with end points 1=not at all and 7=extremely often. Price promotions are not included in this battery of items, but they are operationalized as the respondents' tendency to purchase promotional offers, such as 'buy one get one free'.

The study's results indicate that consumers who have an increased tendency to purchase food products on promotion tend to throw away more food due to a variety of food-waste causes than do consumers who do not exhibit this type of shopping behavior.

Graham-Rowe, Jessop, and Sparks (2014) take a qualitative research approach to explore the nature of household food-waste minimization behavior. To address this aim, the authors incorporate semi-structured interviews and recruit 15 student and non-student participants from 13 households from the South of England, UK. Graham-Rowe et al. (2014) operationalize food waste with open questions that aim to elicit participants' thoughts and feelings regarding food choices and food preparation at home, e.g., 'once at home, how is it decided what food is going to be eaten and when?', 'When, if at all, does food get thrown away in your household?', 'Can you describe why you think this happens?'. The researchers use a similar approach and employ open questions that aim to elicit thoughts and feelings regarding purchasing food, e.g., 'Tell me how you shop for food for your household. Can you describe a typical food-shopping trip?', 'How do you feel about shopping for food?', 'How do you decide what food you are going to buy?'

According to the results, financial incentives, such as price promotions, are cited as a source of food waste. According to Graham-Rowe et al. (2014), 'in-store marketing techniques' put consumers in a predicament and entrap them in the unpleasant dilemma of either buying bulk and saving money, but increasing the likelihood of food waste, or buying smaller quantities of food and spending a larger amount of money, but decreasing the likelihood of creating food waste. However, the authors note that a decrease in disposable income, or other lifestyle changes, compel households to "...adapt their food waste attitudes and behaviors and become less frivolous with food". Moreover, supermarkets

were criticized for “...trying to palm off their own waste onto consumers”, through the use of ‘2 for the price of 1’ offers, typically on fruits and vegetables.

Porpino, Parente, and Wansink (2015) aim to identify antecedents of food waste among lower-middle class families in Brazil, and to that end, the authors incorporate a qualitative approach comprising observation, interviews, photos and a focus group of 14 lower-middle class Brazilian families. The authors do not reveal the purpose of the study to participants but encourage them to elaborate on the topic of food waste when it is mentioned. The authors operationalize food waste based on observations of the process of preparation, consumption and disposal of food, and they complement the data on food waste with photos of food storage compartments as well as the places where food was thrown away. The authors do not provide information on the way they operationalize price promotions.

Porpino et al. (2015) conclude that buying bulk in order to achieve a reduced relative price generates more food waste, and therefore the households’ preference for large and economy packages “...nullifies the efforts to save financial resources at the time of purchase”.

In a subsequent study, Porpino, Wansink, and Parente (2016) aim to further investigate antecedents of food waste in lower-middle income families in the United States. The authors employ a grounded theory approach, with quasi-ethnographic methodology, semi-structured interviews, photos and observations, to a sample of 20 caregivers. The authors do not provide details on the measurement of price promotions; however, the authors did inquire about participants’ food-provisioning routines. Food waste is documented via photos and direct observations by the researchers as it occurs during the households’ every day food-related activities.

Porpino et al. (2016) conclude that point-of-sale promotions are driving consumers to buy more than they need and are conducive to excessive buying, a driver of food waste that according to the authors, is identified in 60 % of the families investigated.

Farr-Wharton, Foth, and Choi (2014) aim to identify factors that promote household food waste behavior; they use a framework that is inspired by the Value-Belief-Norm theory. The authors employ a qualitative research approach with interviews and ethnographic observations in two sequential methods of data collection over a period of three months in Australia. The authors operationalize food waste through observations of food consumption, household waste management practices, photos of the contents of fridges, and weekly examination of the contents of a bin that was provided to the households purposefully for the study. The authors operationalize price promotions with the use of open-ended questions concerning grocery-shopping practices and experiences and food-waste prevalence.

The authors find that, what they coin as price related ‘marketing ploys’ initiated by retailers that promote consumer savings through bulk purchases is a theme that emerges prevalently in their research. They conclude that food purchasing attitudes motivated by the perceived monetary benefit of ‘buy bulk and save’ are primary contributors to households’ waste from expired food. Their findings indicate that ‘marketing ploys’ constitute forces that tap into consumers’ tendency to stockpile food, something that consequently leads to increased amounts of waste due to expired food.

Ganglbauer, Fitzpatrick, and Comber (2013) employ semi-structured interviews and ethnographic observations among a sample of 11 households in Austria and the 3 in the UK, with the aim of investigating everyday domestic practices around food and waste. The authors measure food waste with home tours and fridge cameras deployed inside participants’ refrigerators over a period of one month. Furthermore, the authors incorporate price promotions when developing their interview guide that covers broad themes, including aspects that motivate choices around food, such as price, the process that lasts from planning for food shopping until food is discarded in daily practice, and reasons why food gets wasted in the household.

The results indicate that household efforts to achieve ‘economies of scale’ through the purchase of large quantities of food products often result in buying too much food that is subsequently thrown

away. Households that aim for less-expensive food resort to large quantities instead of smaller ones under the conviction that these are less expensive. The authors note that shopping “...in the context of another dispersed practice such as living on a tight budget” leads people to choose big packages, but consequently, the likelihood of throwing away the unused excessive food is increased.

In a mixed method study, Fonseca (2013) aims to uncover consumer profiles that relate to food waste. The author employs a focus group as well as an online survey administered to a non-representative sample of 542 consumers in Portugal and combines this methodological approach with semi-structured interviews of a subset of 18 of these consumers. Based on the focus group, the author incorporates a multitude of behaviors that are associated with food waste into a questionnaire, which then forms the basis for subsequent semi-structured interviews. Food waste is operationalized as an amalgamation of behaviors that relate to the way in which consumers buy, prepare and dispose of food in their household. Price promotions are operationalized with a question that inquires about whether respondents habitually purchase food during sales of the type ‘take 2 and pay 1’, or ‘buy one get one free’. Respondents have to respond on a yes/no basis.

The results of this study indicate that purchases of price-reduced food products are prevalent in the cluster of consumers who generally exhibit food-waste-promoting behaviors to a higher degree – thus called ‘food wasters’ – than among those characterized as ‘non-food-waste’ consumers. An important finding in Fonseca (2013)’s study, one that potentially impacts the results to a certain degree, is that the majority of those consumers who exhibit food waste behaviors are not the primary buyers of food products in their household, whereas the opposite is the case with the ‘non-food-wasters’.

Articles that found a negative relationship between price promotions and food waste

Neff, Spiker, and Truant (2015) implement a nationally representative survey among a sample of 1,010 consumers in the United States, with the aim of investigating the attitudinal factors that shape consumer decisions to purchase and discard food as well as the extent to which consumers exhibit behaviors that impact food waste. The authors operationalize food waste with five questions that ask whether consumers perform a set of behaviors that Neff et al. (2015) characterize as waste-promoting and waste-reducing. These behaviors include a) perceived knowledge about reducing waste of food; b) estimation of the waste of food in the U.S.; c) estimation of the total percentage of food the participants themselves discard; d) estimation of the household waste of food in comparison to that of the average American; e) acceptance of the brown banana; and f) perceived current effort to minimize waste of food. Price promotions are operationalized with one item that asks about the frequency with which participants buy too much food due to sales. The response scale was a 5-point Likert scale with the end points 'always' and 'never'.

The relationship between price promotions and food waste is established indirectly based on the findings of the study. The authors found that approximately half of the respondents indicate that they sometimes buy too much food due to it being price-promoted. A small minority (approximately 2 %) indicate that they always buy food on promotion, whereas 9-10 % of respondents report that they often buy food on promotion. Respondents overwhelmingly reported low amounts of food waste, with 13 % indicating they do not discard any food, and 56 % indicating that they throw out less than 10 % of the food they buy. Interestingly, Neff et al. (2015) provide respondents with a list of possible changes that could be implemented by retailers to help reduce the amount of food that is wasted at the household level. Here, the results show that 48 % of respondents indicate that they would like an increase in 'buy one get one later' promotions as well as discounts on foods that are over-ripe or near

expiration (48 %), indicating that consumers regard price promotions as an initiative that can reduce rather than increase food waste.

In a single study that resulted in three separate articles, Silvennoinen, Katajajuuri, Hartikainen, Heikkilä, and Reinikainen (2014), and Koivupuro et al. (2012) set out to investigate the volume, composition, and drivers of food waste among Finnish households, whereas Katajajuuri, Silvennoinen, Hartikainen, Heikkilä, and Reinikainen (2014) expand that aim and include all parties involved in the Finnish food production-consumption chain. The joint data collection process is described below, however the results of the article by Katajajuuri et al. (2014) are described in the subsequent chapter because they differed.

During the data collection process, the researchers employ an approach at the household level that combines a kitchen diary and questionnaire among a sample that is not entirely representative of the Finnish population; the sample includes 380 households with 1,054 individuals. The researchers measure food waste with the use of a kitchen diary containing detailed instructions on how households should weigh and record their food waste as well as the reasons for the waste. Participants weigh their food waste daily and assign a note on the reason why the food was wasted, such as ‘spoiled’ or ‘past best-before date’. Participants register food waste under pre-defined headings such as ‘bread’, ‘potatoes and potato products’. Unavoidable food wastes, e.g., peels, bones and coffee grounds, are excluded from the measurement process, but potable dairy products and milk are included. The authors do not provide detailed information on how they measure price promotions; however, they describe how they study the influence of several socio-demographic, behavioral and attitudinal factors relating to food waste. Price promotions are measured as the degree of ‘appreciation for low food prices’, and more specifically, their ‘valuation of offers’ when buying. It can be deduced from the results section that the authors ask about the frequency with which participants buy food products on sale; however, the authors do not provide information on the response scale used for quantifying the independent variable.

Silvennoinen et al. (2014)'s results show that 'appreciation of low food prices' in the form of BOGOF offers and frequent purchases of discounted food products is a factor with a statistically significant inverse impact on the amount of food waste in a household. The amount of food waste in households that shop both low-priced as well as discounted food products and BOGOF offers is less than food waste in households that do not shop that way.

The results of the study by Koivupuro et al. (2012) show that households that do not buy discounted food products or BOGOF offers waste more food than those households who do buy food products on discount. This finding is uncorrelated to the households' overall income, and thus the authors conclude that consumers who tend to buy discounted food products value food more and therefore waste less of it.

Parizeau, von Massow, and Martin (2015) collect organic, recyclable and garbage waste data from a non-representative sample of 222 households in Guelph Ontario, Canada and combine these data with survey results obtained from a subset of 68 households; the survey contains attitudinal, behavioral and food-waste-related belief measures. The authors operationalize food waste by means of weighing organic, recyclable and residual garbage produced by the participating households; however, their observations do not include waste that is discarded in other ways than being placed in the recycle bin, e.g., being put in composting units or fed to pets. The resulting weights are subsequently standardized and averaged to reflect a 7-day weighing period.

The authors conduct door-to-door surveys with the household member primarily responsible for the households' shopping and cooking. They operationalize price promotions by inquiring into the household's shopping and cooking practices, and more specifically into the frequency with which the household buys foods that are price-promoted. The authors do not provide further details on the response scale.

The results indicate that 34% often or always bought price-promoted food; however, only 2 % of the respondents indicate that they often waste food that was bought on promotion. Moreover, the

authors' findings indicate that households that report that they do not often waste discounted foods tend to produce fewer types of food waste overall. Parizeau et al. (2015)'s findings point to the conclusion that price promotions do not necessarily lead to increased amounts of food waste.

Jörissen, Priefer, and Bräutigam (2015) focus on factors within the household that influence the generation of food waste, such as shopping, eating and food preparation habits. The authors administer an online survey to a non-representative sample of 857 researchers in two European research centers, KIT in the city of Karlsruhe, Germany (n=453), and JRC, Ispra, Italy (n=404). The authors operationalize food waste by asking participants to estimate the amount of edible food waste they generate in certain predefined food categories, using a scale with the following levels: nothing, 250-500, 500-1000, 1000-2000, more than 2000 g per household/week. On the basis of this information, the authors calculate the amount of food waste produced per capita within each household. Price promotions are operationalized as 'attraction to special offers' by the item 'Do you think you are drawn to special offers, e.g., 'buy one get one free', 'three for the price of two etc.', with the following answer options: Yes, sometimes, no.

The results of Jörissen et al. (2015) indicate that consumers who are more often drawn to special offers waste less food on average than consumers who are less interested in special offers.

Williams, Wikström, Otterbring, Löfgren, and Gustafsson (2012) aim to investigate reasons for food waste and particularly how and to what extent packaging influences food waste in households. They employ a mixed study, with the use of a kitchen diary and questionnaire, in a non-representative sample of 61 families in and around the county of Värmland, in Midwest Sweden. The authors measure food waste both in connection to meals and in connection to storage of foods. In the former case, the amount of discarded food, whose measurement excludes inedible food parts such as bones, peels, or any other inevitable waste, is weighed and recorded in a kitchen/food waste diary either by weight or in volume numbers. Participants are thereafter asked to indicate the reason(s) for discarding food by choosing among 6 alternatives. An example of an answer option is 'saved leftover not used

in time'. In the latter case, i.e., in relation to storage of foods, Williams et al. (2012) provide respondents with a list of eight different reasons for wasting the foods they did. An example of an answer option is 'bought too much'.

Williams et al. (2012) operationalize price promotions with statements relating to the shopping habits of the households. The authors operationalize price promotions as the household's 'price awareness', i.e., caring about price/kg and the use of discount coupons, with two statements that address how price influences purchase behavior: 'I/we look around and decide a lot based on price/kg' and 'I/we purchase food items with discount coupons'. All answers were recorded on a 7-point Likert scale with end points 1=do not agree at all and 7=do fully agree. These two items are subsequently merged into one variable, 'price awareness', and based on the variation in responses, the authors perform a median split to divide the sample into two groups, one that 'places high importance on price' and one that places low importance on price.

The authors conclude that on average, the households that note 'price to be more important' waste less (1.51 kg/household/week) than the households that note 'price to be less important' (1.86 kg/household/week).

Sassi et al. (2016) administer an online survey to a random, non-representative sample of 281 Tunisian consumers with a multifold aim to assess the impact of behaviors regarding food and food management on the quantity of food waste. The authors operationalize food waste with an item that asks for an estimate of the edible food households dispose of per week based on predefined levels of waste, starting from throwing away nothing, to less than 250 g, 250-500 g, 500-1000 g, 1000-2000 g, and more than 2000 g per household/week. Measurement of price promotions is done with the question 'Do you think you are drawn to special offers? (e.g., 'buy one get one free', 'three for the price of two', etc.)'. The authors do not specify the response scale.

The results of the study by Sassi et al. (2016) do not establish an explicit association between price promotions and food waste; however, the directionality of the relation can be implicitly inferred based

on the information the authors provide. Almost half of the participants (46 %) indicate that they are attracted to special offers; however, 39 % of them indicate that they do not throw away any food at all, and 23.5 % that they throw away less than 250 g of food per week.

Aschemann-Witzel, Jensen, Jensen, and Kulikovskaja (2017) aim to explore consumers' considerations when during grocery shopping, they encounter price-reduced food products that are close to their expiration date. The authors employ an approach that combines an online experimental survey of a representative sample of 848 Danish consumers and 16 qualitative accompanied shopping interviews. Measurement of food waste takes place with the following item: 'If you estimate your own household, how much of the following food that you buy or cook ends up being thrown away at home?' The authors' enquiry relates to five product categories: fresh fruits and vegetables, milk and dairy, bread and other bakery products, meat and fish, and prepared dishes/meals. Price promotions are operationalized as consumers' 'price criterion', which consists of the following questions: 'I frequently buy food close to the best-before date, if it is offered at a lower price', and 'I look for ads in the newspaper for store specials or purchase food that is on discount'.

The results of the study by Aschemann-Witzel et al. (2017) do not support the assumption that price promotions lead to increased amounts of food waste; rather, they indicate the opposite. Consumers who are 'price focused' produce less food waste than do consumers who are not. The authors interpret these results as being the outcome of consumers' price consciousness, which creates increased consciousness and valuation of food.

Articles that found a neutral relationship between price promotions and food waste

Evans (2012) employs a qualitative approach with the aim of offering a sociological analysis of household food waste. The author draws on ethnographic observations to illustrate how food waste arises as a consequence of domestic practices, with special emphasis on, among other factors, those

household routines that relate to food provisioning, as well as the contingencies of everyday life. To meet his aim, the author engages with the residents of 19 households on two ‘ordinary’ streets in Manchester, UK in an eight-month ethnographic study. Evans (2012) focuses primarily on the reasons why purchased food becomes wasted, rather than on quantifying food waste. The author does not provide details for the measurement of price promotions, but based on the presentation of the study’s results, this can be deduced to have been incorporated into the repeat in-depth interviews with participants, where the author discusses, among other topics, the ways in which households shop for their food.

Evans (2012) results indicate that every participating household routinely buys more food than necessary and wastes the vast majority of that surplus. However the author concludes that “...it is not satisfactory to position food waste as a matter of profligate consumers being lured in by ‘buy one get one free’ offers and then being too lazy to cook properly or find a use for every last scrap of foodstuff before mindlessly throwing the discards in the bin’”. Instead, the author suggests, food is being discarded as a consequence of the enactment of everyday domestic practices and contingencies of everyday life in the household.

Katajajuuri et al. (2014) set out to investigate the volume, composition, and drivers of food waste among parties involved in the Finnish food production-consumption chain (see previous chapter for a detailed description of the data collection process). The authors find that there is no correlation between food waste levels and discounted prices. Their results indicate that households who bought ‘buy one get one free’ and price-reduced food products more frequently did not end up wasting either more or less food compared to households that did not follow that practice. It is noteworthy that households who consider low prices to be an important factor when buying food waste less food than do households who do not consider low food prices to be important.

Qi and Roe (2016) aim to estimate models of consumer food waste awareness and attitudes; to that end, they employ telephone interviews in an omnibus study of a representative sample of 500

consumers in the United States. The authors, measure food waste awareness and attitude with the use a slate of nine statements relating to food waste, for instance: ‘Throwing away food is bad for the environment’. Similarly, an example of one of these statements that measures price promotions is: ‘I/we waste more food when bought in large packages or large quantities during sales’. Participants are asked to express their agreement or disagreement with the statements on a four-point Likert scale ranging from 1=strongly agree, to 4=strongly disagree.

Results from Qi and Roe (2016)’s research indicate that consumers are split with respect to their perception of price promotions and their role in attenuating or exacerbating food waste in their households. Respondents are equally split between agreeing and disagreeing that food waste is exacerbated by bulk and sale purchases (52.9%). The authors merge three statements to create a component that reflects the potential for further reduction of food waste. A significant positive loading of the particular construct comes from the agreement that bulk purchases due to price promotions exacerbate food waste in the household; however, the authors do not provide any information on the internal consistency of that construct. These results indicate that the prevailing notion is that price promotions are associated with exacerbation of food waste. However, as mentioned above, respondents are split between agreeing and disagreeing with that statement.

Yildirim et al. (2016) aim to explore the demographic, social and economic factors that affect household food waste behavior in Turkey. To that end, they employ an online survey among a non-representative sample of 150 Turkish consumers. The authors operationalize food waste with a question relating to how much edible food households throw away on a weekly basis. The range of available answers varies from ‘I do not throw away food that is still consumable’ and moves upward in increments to ‘More than 2 kg’. Although Yildirim et al. (2016) do not provide any information on how they operationalize price promotions, this can be deduced from the results, where the authors state that ‘...Supermarkets and hypermarkets attract consumers and increase their purchase by applying marketing strategies such as the special offers (buy 2 get one free, buy 2 and get 30% off,

etc.)’’. The answer scale is not explicitly provided, but it can be inferred that the authors ask participants to state the frequency with which they buy price-promoted food products.

According to the results of the survey by Yildirim et al. (2016), 51 % of respondents are attracted to special offers and sales when they buy food, while approximately 37% are only sometimes attracted by these offers. Moreover, in response to the above-stated question regarding the amount of edible food wasted at the household level per week, approximately 44 % of the sample responded that they do not throw away any food, while 27.3% answered that they waste less than 250 g and 21.3% throw out between 250 g and 500 g food per week.

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