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Waste not: selling near-expired bread in Indonesia

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Abstract

The high volume of global food waste in recent years has brought about economic and environmental catastrophes. At the retail level, food waste occurs as a consequence of maintaining high aesthetic standards, such as tossing out imperfect foods or foods that are nearing "best before" or expiry date. This study aims to investigate factors affecting consumer intention to buy near-expired bread in Indonesia, the world's largest importer of wheat grain and a growing market for the bread industry. Previous studies have demonstrated that price consciousness and sale proneness are predictors of purchase intention of perishable foods. This research extends previous studies by incorporating perceived product quality in the purchase intention of near-expired bread. This study gathered 258 Indonesian consumers of near-expired bread. By using SEM-PLS approach, this study demonstrates that price consciousness, sale proneness, and product quality have positive and significant effects on purchase intention of near-expired bread. The results of this research provide guidelines for bakery shops owners and marketers on how to sell near-expired bread thereby reducing food waste and recouping financial losses due to production excess.

Keywords Food waste · Price consciousness · Product quality · Sale proneness · Purchase intention

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1 Introduction

Food waste is the major concern of developed and developing countries for the last 10 years. Not only is it an environmental problem that contributes to greenhouse gas emissions, food waste is also a big economic problem. According to the Food and Agriculture Organization or FAO (2013), one third of foods produced globally were wasted. It is equal to more than 1.3 billion tons of waste food per year and an estimated cost of around 750 billion dollars annually. Throwing so much waste food away means losing money for nothing or world economic loss. That is why the United Nation calls for action to reduce waste food.

For many years, consumption patterns of modern citizens have degraded the environmental quality (Shamsi and Siddiqui 2017). Retailers and consumers contributed to food waste by throwing edible food into the bin. According to FAO (2011), food is wasted in at least three different ways: discarding fresh produce that deviates from the optimum, discarding foods that are beyond "best before" date, and discarding edible leftovers because they were purchased in excess or more than what were needed.

Based on the Food Sustainability Index issued by the Economist Intelligence Unit (EIU) in 2018, Indonesia is on the top ten lowest performers in food loss and waste among middle-income countries. Soma (2018) argues that the rise of modern supermarkets in Indonesia contributes to the increase of food waste in the country. First, these supermarkets typically maintain high aesthetic standards hence imperfect foods will be removed from the shop. Second, through "buy one get one free" offers thereby encouraging impulse buying. Previous studies suggest that impulse buying or purchase activities without prior planning have contributed to food waste (Porpino, Parente, and Wansink 2015; Joshi and Visvanathan 2019).

Bread industry is one of Indonesia's fastest growing industries. According to Statista (2020), the country booked a revenue of to US$2861 m in the bread segment. The annual market growth of the bread segment is estimated at 5%. The country's increasing population and income per capita hence growing consumption of bread fueling the import of wheat (Australian Export Grains Innovation Centre 2019). One of the central challenges in Indonesia's bread industry is managing near-expired bread, bread leftovers and bread waste which contribute to the total amount of food waste and environmental damages in the country (Bantacut and Zulaikha 2019).

Previous studies on food waste have identified several factors which influence consumers' willingness to purchase near-expired foods. For instance, Konuk (2015) identified two factors which were price consciousness and sale proneness. Nevertheless, the author cannot prove the relationship between sale proneness and the purchase intention of the so-called Expiration Date-Based Pricing (EDBP) perishable foods. We argue that one of the reasons for the unsupported relationship between the two variables is because the author did not attempt to specify the food categories. Previous study by Yin et al. (2010) has demonstrated that the food categories influence the willingness to pay.

This study seeks to investigate factors affecting the purchase intention of near-expired bread in Indonesia, the world's largest wheat importer (Workman 2019). Wheat bread is a type of bread made from flour milled from wheat grain. Factors investigated in this study are price consciousness, sale proneness, and product quality which are hypothesized to influence the purchase intention of near-expired bread. This study

extends the theoretical model proposed by Konuk (2015) by examining the role of product quality in perishable foods purchasing intention. By using near-expired bread as the focus of the study, we seek to contribute in two ways: firstly, we propose solutions for bakery shops owners and marketing practitioners on how to sell near-expired bread. Secondly, we propose solutions on how to reduce bread waste in Indonesia.

In marketing literature, the term expiration date-based pricing, which is a relatively new and unknown phenomenon (Grewal et al. 2012), indicates the practice of selling at discount price for food that approaches its expiration date (Theotokis, Pramatari, and Tsiros 2012; Konuk 2015). Theotokis et al. (2012) investigated the effect of expiration date-based pricing on brand image. Through a series of experimental research, they demonstrated the negative effects of expiration date-based price on brand quality perceptions among loyal consumers.

The rest of this paper is organized as follows: first is literature review where we discuss the main theories used to construct our hypotheses; second is research methodology where we elaborate the sampling and measurement scales utilized in this study; third is the results where we provide the statistical findings; fourth is the discussion where we explain and elaborate our statistical findings, theoretical contributions, managerial implications and future research directions; lastly is the conclusion where we summarize our paper and main findings.

2 Literature review

Lichtenstein, Ridgway, and Netemeyer (1993) extensively review pricing and sales promotion literature. They identified two broad factors that may affect consumer perception of price. The first factor was named the negative role of price which consisted of five variables: value consciousness, price mavenism, price consciousness, sale proneness and coupon proneness. The second factor was named the positive role of price which consisted of price–quality schema and prestige sensitivity. Negative role means higher price will result in lower purchase probability. On the contrary, a positive role means higher price will result in greater purchase probability.

Price consciousness is defined as *"the degree to which the consumer focuses exclusively on paying low prices"* (Lichtenstein et al. 1993, p. 235). Sinha and Batra (1999) argue that price consciousness is an enduring predisposition that varies in intensity across individuals. A person may be more price conscious than the others depending on various factors, such as his or her attitude on the importance of savings as well as his or her socio-economic status. A person who is price conscious is willing to put in some extra effort into finding a lower price or the lowest price for a particular product or item by visiting multiple stores. Moreover, Gabor and Granger (1961) argue that the fact that consumers are able to remember their amount of expenditure in the last 7 days can be taken as evidence that they are conscious about the price paid.

Sale proneness is defined as *"an increased propensity to respond to a purchase offer because the sale form in which the price is presented positively affects purchase evaluations"* (Lichtenstein et al. 1993; p. 235). Sale also means a discount from the regular price. According to Arunkumar et al. (2006), there are two types of classical discount: the first type is quantity discounts by which consumers receive an average

price deduction when they purchase certain amounts of each product. The second type is business volume discounts by which consumers receive a price deduction from the total value of all products ordered. Despite the benefits, previous studies have noted some drawbacks of sale proneness, such as reduced brand loyalty, brand benefits and price-quality inferences, because consumers only buy certain products when they are on sale (Lichtenstein, Burton, and Netemeyer 1997; Jin and Sternquist 2003; Van der Lans, Van Everdingen, and Melnyk 2016). However, in the context of food, having sale prone consumers might be beneficial for the environment. For instance, Vittuari et al. (2020) propose discounted price on nearly expired foods as one of several food waste reduction strategies.

Konuk (2015) examined the role of price consciousness and sale proneness on purchase intention. The two are the most relevant variables in reference pricing. Moreover, he proposed that perception of price in its negative role will result in increasing consumers' search for lower prices. He found that price consciousness and sale proneness were related to certain marketplace behaviors such as low price search outside the shop.

Previous studies showed that there was a significant relationship between price consciousness and sale proneness. For instance, Garretson and Burton (2003) found a positive relationship between price consciousness and sale proneness. When examining price perception and the relationships among its dimensions via structural equation modeling, Gecti (2014) also confirmed the positive effect of price consciousness on sale proneness. Similarly, Konuk (2015) revealed a positive relationship between price consciousness and sale proneness. All these studies essentially support the work of Lichtenstein et al. (1997). Therefore, we propose the following hypothesis:

- **H$_1$:** Price consciousness has a positive effect on sale proneness.

Product quality is defined as *"the degree of how well the product specification fits the customer's expectation"* (Yu and Fang 2009; p. 1276). To assess the quality of a product, consumers often depend on quality cues. According to Ophuis and Van Trijp (1995), there are two types of quality cues namely intrinsic and extrinsic cues. An intrinsic cue can be derived from the product characteristics, such as flavor, color, and shape. Meanwhile, an extrinsic cue is not directly related to the product characteristics yet it is fundamental in consumer decision making. According to Teas and Agarwal (2000), examples of extrinsic cues are price, brand, place of purchase, and country of origin. Depending on the natures of the products and their consumers, Kardes, Kim, and Lim (2001) argue that consumers differ in their dependence on intrinsic or extrinsic cues. In assessing product quality, consumers can also use product specifications which are a set of product attributes that consumers attempt to evaluate in order to determine whether the product assessed is capable to fulfill their needs.

Product attributes are product-related knowledge consisting of search attributes, experience attributes and credence attributes: Search attributes may concern production time and expiration dates, as well as product's appearance which can be observed by consumers; The experience attributes concern the product's freshness and ease of use; The credence attributes cannot be observed directly, such as healthfulness and risks (Caswell and Mojduszka 1996; Grolleau and Caswell 2006; Dörnyei and Gyulavári 2016). As for food products, not all product attributes can be evaluated directly by

consumers. A food may look nice to eat, but the actual taste is only known after consuming it. Generally speaking, in the context of foods, consumers may assess the product (food) quality by their presentations, such as colors, tastes, ingredients, purity or how well they were made (Yu and Fang 2009; Walsh et al. 2012; Vo and Nguyen 2015; Ho et al. 2020).

A study by Reid et al. (2014) highlights the relationship between utilitarian aspects of a product with sale proneness. Their utilitarian aspects of product consist of monetary savings, product quality, and shopping convenience. Implicitly, there is a relationship between product quality and sale proneness.

According to price-quality schema theory, consumers rely on price information to derive hints on product quality (Lichtenstein et al. 1993; Tsalis 2020). Konuk (2015) argues that there is a positive relationship between price perception and product quality: high price reflects high quality. Meanwhile, Maina (2003) argues that quality and price have a two-way relationship hence the inverse relationship (quality-price schema) is also true: a positive evaluation on product quality and its attributes leads to high price expectations (e.g. a product is perceived to be more expensive than it actually is). We argue that the higher the perception of the product quality (hence high price expectations), the more consumers are willing to respond to a purchase offer when it is on sale. Therefore, we propose the following hypothesis:

- **H₂:** Product quality has a positive effect on sale proneness.

Purchase intention is one of the most important constructs in marketing that has been widely used as a predictor of subsequent purchase (Grewal et al. 1998). It is briefly defined as the consumer's likelihood to purchase a particular brand or product when given the opportunities (Kim and Kim 2004; Copeland and Bhaduri 2019). Purchase intention may also refer to the reasons why a particular product is bought and is more preferred by a consumer under certain conditions (Shah et al. 2012). Marketers use purchase intention to forecast how much and how likely consumers are to purchase their products. Purchase intention is also used to measure consumer demand for certain products in a given time interval. However, the gap between purchase intention and actual purchase (intention-behavior gap) may occur due to various factors, such as personal values, information and knowledge, and product availability (Vermeir and Verbeke 2006).

There have been many studies on purchase intentions of food products. The types of food products that have been investigated, among others, organic food products (Curvelo, De Morais Watanabe, and Alfinito 2019; Shahriari et al. 2019; Pandey et al. 2019), genetically modified food (Bredahl 2001), sustainable dairy products (Vermeir and Verbeke 2006), halal food (Setiawati, Chairy, and Syahrivar 2019) and perishable food (Konuk 2015). Thus far, there have been very limited studies on product purchase intentions of near-expired foods, let alone near-expired bread. This study attempts to expand the literature in food purchase intention.

There are some contradictory findings regarding the relationship between price consciousness and purchase intention. For instance, a study by Lee (2008) with Taiwanese samples demonstrates the positive effect of price consciousness on store brand purchase intention. In the same context with this study, Konuk (2015) also found a significant and positive effect of price consciousness on purchase intention toward

expiration date-based priced perishable foods. Meanwhile, in the context of running shoes, Alford and Biswas (2002) argued that price consciousness had a negative relationship with purchase intention, although in the end their results could not support their argument. However, in the context of green products, Sun and Wang (2019) managed to prove that price consciousness had a negative relationship with purchase intention. We argue that the contradictory findings are due to the nature of the products being investigated. For instance, high involvement products, such as running shoes and green products, would lead to negative relationships between the two variables. Meanwhile, low involvement products, such as foods, would lead to positive relationships. Since foods, such as bread, are typically categorized as a low-involvement product (Friedmann and Lowengart 2019; Aschemann-Witzel, Giménez and Ares, 2020) hence we propose the following hypothesis:

- **H₃:** Price consciousness has a positive effect on purchase intention.

Kotler and Keller (2016) defined product quality as the ability of a product's characteristics to satisfy the needs of consumers. Logically, products with a higher quality are more preferred by consumers which should translate into higher purchase intention. Previous studies showed that product quality had a positive effect on purchase intention. For instance, a study by Walsh, Shiu, and Hassan (2012) with German samples demonstrates a direct and positive effect of product quality on purchase intention. Similarly, a study by Vo and Nguyen (2015) on factors influencing customer perceived quality and purchase intention toward private labels in the Vietnam Market revealed a direct effect of perceived quality on purchase intention. Therefore, we propose the following hypothesis:

- **H₄:** Product quality has a positive effect on purchase intention.

Alford and Biswas (2002) proposed and showed that highly sale-prone consumers expressed greater purchase intention when exposed to a discount ad. Although the research findings of Konuk (2015) did not support the positive effect of sale proneness on purchase intentions, other researchers showed that sale proneness did have a positive effect on purchase intention. In the context of American consumers, Zhou and Nakamoto (2001) argued that it was natural for young consumers to purchase products when they were on sale. A study by Bhardwaj, Das, and Khare (2015) with Indian samples demonstrated a positive relationship between sale proneness and purchase decision involvement. Moreover, Tripathi and Pandey (2019) confirmed the mediating role of sale proneness in the purchase intention of green products. Therefore, we propose the following hypothesis:

- **H₅:** Sale proneness has a positive effect on purchase intention.

3 Research methodology

The theoretical model of this study is illustrated in Fig. 1. Price consciousness and product quality are exogenous variables, sale proneness is a mediating variable and purchase intention is an endogenous variable.

The population of this study was the Indonesian consumers of near-expired bread. We employed a purposive sampling by carefully selecting our respondents that fit with the topic or phenomenon under investigation. We developed a questionnaire and spread it face-to-face with our potential respondents in several big bakery shops in Jakarta that sell near-expired bread at a discount. For this reason, we spread the questionnaire during the closing hours of the bakery shops and specifically target the bread consumers who came to the shops where the near-expired breads were on display. The other way to confirm whether near-expired breads were offered in a bakery shop during the data gathering was by examining their labels (e.g. 50% discount, expiry date, etc.). According to Dörnyei and Gyulavári (2016), product labels are an important source of consumer decision making, especially for consumers who rely heavily on price. On top of that, the questionnaire contains two filter questions (YES/NO): "Do you know that this bakery shop sells near-expired bread at a discount?" and "Have you ever bought near-expired bread?". Only those who answered YES were further processed for this study. After 2 weeks, this study successfully gathered 258 valid respondents. As the capital of Indonesia, Jakarta has around 10 million residents who come from several major provinces in Indonesia hence they are quite representative to Indonesian consumers in general. The profile of the respondents in this study can be seen in Table 1.

The 18-item questionnaire (5 Likert-Scale) was developed by adapting the measurement scales from the previous studies. The price consciousness scale (5 items) was adapted from Lichtenstein et al. (1993); the product quality scale (4 items) was adapted from Vo and Nguyen (2015), and Walsh et al. (2012); the sale proneness scale (6 items) was also adapted from Lichtenstein et al. (1993); finally, the purchase intention scale (3 items) was adapted from Grewal et al. (1998). A pre-test involving 30 respondents was conducted to assess the reliability of each measurement scale. The Cronbach's Alpha(s) of price consciousness, product quality, sale proneness and purchase intention are 0.898, 0.943, 0.902, and 0.932 consecutively. Further details on the operationalization of variables can be found in the appendix.

This study utilized SEM with SmartPLS software version 2.0. to analyse the data. The bootstrapping technique was applied to determine the loadings significant level, weights, and coefficients. As advised by Hair et al. (2014), this study adopted two-stage analytical procedures. It began with testing the validity and reliability of the measurement model, and then followed by an examination of the structural model.
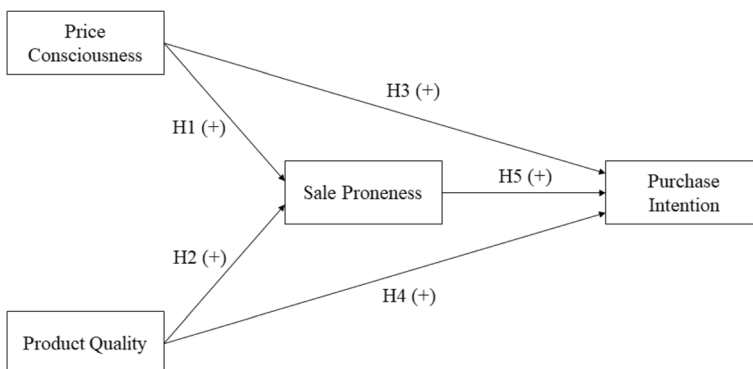

Fig. 1 Theoretical Framework

Table 1 Respondent profile

		Frequency	Percentage
Gender	Male	106	41%
	Female	152	59%
Age	18–29	75	29%
	30–39	83	32%
	40–49	72	28%
	≥50	28	11%
Education	Bachelors	229	89%
	Masters	23	9%
	PhDs	6	2%
Status	Single	59	23%
	Married	191	74%
	Divorced	8	3%
Total		258	100%

4 Results

Based on Table 2, price consciousness (PC), product quality (PQ), sale proneness (SP) and purchase intention (PI) have high mean values which indicate very strong agreements toward the items in each variable. The standard deviation (S.D.) value of each item which is mostly less than 1, meaning that the value of each case is located close to the mean value.

We performed the Chi-square tests in order to test the relationship between the demographic variables and the four main variables incorporated in this study. The results suggest that 1) there are significant differences in age, education level and marriage status on price consciousness (Pearson Chi-Square < 0.05); 2) there is a significant difference in education level on perceived product quality (Pearson Chi-Square < 0.05); 3) there are significant differences in gender, age and education level on sale proneness (Pearson Chi-Square < 0.05); 4) there is a significant difference in education level on purchase intention (Pearson Chi-Square < 0.05). In general, we can conclude that education level affects the price consciousness, perceived product quality, sale proneness of consumers as well as their purchase intention.

Hair et al. (2014) suggest that a measurement model should satisfy convergent validity and discriminant validity. The convergent validity was tested using factor loadings, composite reliability (CR) and average variance extracted (AVE). The CR values should be 0.7 or higher, while AVE values should be higher than 0.5. Table 3 showed the result of convergent validity test. As recommended by Fornell and Larcker (1981), the discriminant validity is achieved when the square root of the AVEs (diagonal values) exceeds their corresponding correlation coefficients (off diagonal values).

Table 4 shows the result of discriminant validity tests. Overall, the measurement model satisfies the convergent validity and discriminant validity.

Table 2 Descriptive Analysis

	Min	Max	Mean	S.D.
PC1	1.0	5.0	4.158	.9808
PC2	1.0	5.0	4.234	.9181
PC3	1.0	5.0	4.190	.9180
PC4	1.0	5.0	4.222	.9143
PC5	1.0	5.0	4.177	1.0498
PQ1	1.0	5.0	4.127	.8196
PQ2	1.0	5.0	4.272	.9686
PQ3	1.0	5.0	4.304	1.0388
PQ4	1.0	5.0	4.361	1.0358
SP1	1.0	5.0	4.259	.9251
SP2	1.0	5.0	4.177	.9611
SP3	1.0	5.0	4.158	1.0253
SP4	1.0	5.0	4.114	.9902
SP5	1.0	5.0	4.278	.9299
SP6	1.0	5.0	4.051	.9826
PI1	1.0	5.0	4.437	.8989
PI2	1.0	5.0	4.392	.9364
PI3	1.0	5.0	4.462	.9004

The structural relationship between constructs were examined in the SEM model. Figure 2 shows the path coefficients and R^2 (the coefficient of determination) for each exogenous variable. As suggested by Hair et al. (2014), t-values were calculated to examine the significance of path coefficients through the bootstrapping procedure with 5000 subsamples. The blindfolding procedure was run to get Stone-Geisser criterion (Q^2) value to show the predictive relevance of the research model. The goodness of fit (GoF) was also calculated for this model.

Table 5 is the statistical results of a measurement model which shows the values of path coefficients, t values, R^2, Q^2, and GoF. The quality of the structural model was evaluated through the value of R^2. The R^2 for sale proneness (0.707) and purchase intention (0.705) are quite high, indicating these two endogenous variables are well explained by their exogenous variables. The Q^2 value is above zero, indicating the model has predictive relevance. The value of GoF is 0.54, indicating a large GoF. The significance threshold for t values with 95% confidence level is 1.96 (Hair et al., 2014). Based on the results, all hypotheses are supported in this study (t-values>1.96; $p < 0.05$).

5 Discussion

Based on the results, price consciousness has a positive and significant effect on sale proneness (t value = 4.543 > 1.96; H_1 is supported). This result supports the findings of

Table 3 Result of convergent validity test

Variables and Indicators	Standardized Loadings	CR	AVE
Price Consciousness (PC)		0.925	0.713
PC1	0.901		
PC2	0.851		
PC3	0.809		
PC4	0.832		
PC5	0.825		
Product Quality (PQ)		0.933	0.776
PQ1	0.872		
PQ2	0.876		
PQ3	0.905		
PQ4	0.870		
Sale Proneness (SP)		0.943	0.733
SP1	0.858		
SP2	0.860		
SP3	0.845		
SP4	0.816		
SP5	0.861		
SP6	0.896		
Purchase Intention (PI)		0.968	0.909
PI1	0.947		
PI2	0.952		
PI3	0.962		

Lichtenstein et al. (1993), Lichtenstein et al. (1997), Alford and Biswas (2002), Garretson and Burton (2003), Gecti (2014) and Konuk (2015). It means that bread consumers who are price conscious (e.g. constantly looking for low or lower prices) are more motivated to buy near-expired bread because of the deals offered by the bakery shops.

Product quality has a positive and significant effect on sale proneness (t value = $3.381 > 1.96$; H_2 is supported). Reid et al. (2014) hypothesized that there was a positive relationship between quality consciousness and in-store price proneness. However,

Table 4 Result of discriminant validity test

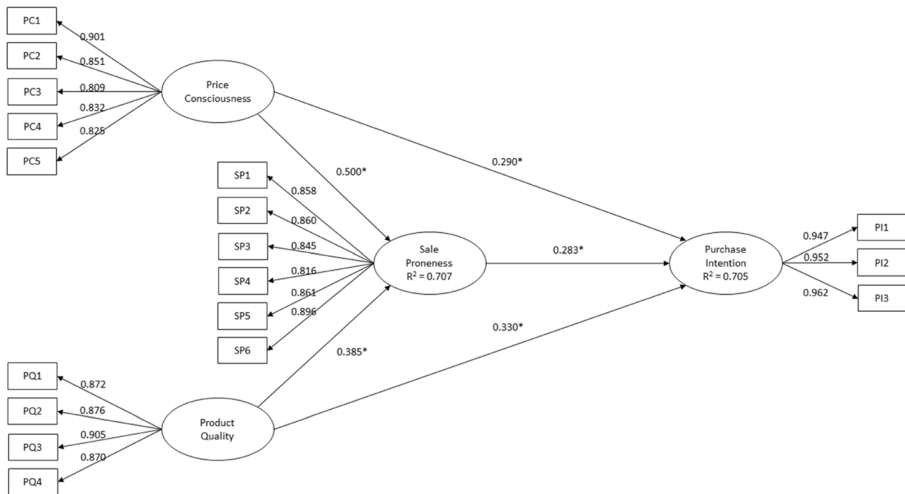|	Price Consciousness	Product Quality	Sale Proneness	Purchase Intention
Price Consciousness	0.844			
Product Quality	0.801	0.881		
Sale Proneness	0.809	0.786	0.856	
Purchase Intention	0.783	0.784	0.776	0.954

Fig. 2 Path coefficients and R² values

their findings were unable to support the relationship. This result also proves the quality-price schema hypothesis: a positive or negative evaluation on the product quality affects consumers' perceptions on the product's price (e.g. a product is perceived to be either more expensive or cheaper than it actually is).

Price consciousness has a positive and significant effect on purchase intention (t value 2.604 > 1.96; H_3 is supported). This result supports the findings of Lee (2008) and Konuk (2015). Bread consumers who are (high) price conscious have a higher intention to purchase near-expired bread. That is because near-expired bread is typically offered at a discount (e.g. 50% discount) hence it may be perceived by price conscious consumers as a good value for money.

Product quality has a positive and significant effect on purchase intention (t value 3.249 > 1.96; H_4 is supported). This result supports the findings of Walsh et al. (2012) and Vo and Nguyen (2015). The significant relationship between the two variables implies that the respondents also concern with the near-expired bread quality (e.g. taste, color): positive evaluations on the near-expired bread quality should result in high purchase intention. In this study, we assume that respondents have certain acceptable near-expired bread quality level in mind prior to purchasing the bread.

Table 5 Statistical result of measurement model

Hypothesis	Structural Relation	Path Coefficients	t-values
H1	PC → SP	0.500	4.543*
H2	PQ → SP	0.385	3.381*
H3	PC → PI	0.290	2.604*
H4	PQ → PI	0.330	3.249*
H5	SP → PI	0.283	2.123*

Note: *Statistically significant at p < 0.05

Sale proneness has a positive effect on purchase intention (t value = 2.123 > 1.96; H_5 is supported). This result supports the findings of Bhardwaj et al. (2015) and Tripathi and Pandey (2019). In the context of perishable food, Konuk (2015) is unable to support this relationship. We argue that specifying the food categories (e.g. bread) can generate a better result. Moreover, we also found that sale proneness partially mediates the relationship between price consciousness and purchase intention and between product quality and purchase intention.

This study has three theoretical contributions: first, we manage to prove empirically that sale proneness has a positive effect on purchase intention; whereas the previous study on perishable food (Konuk 2015) cannot. Second, we manage to prove empirically that product quality has a positive effect on sale proneness. While price-quality schema has been discussed extensively, the reverse schema or quality-price schema in which the evaluation of product quality and its attributes affects price expectations (e.g. more expensive than it actually is) is less explored in marketing literature. Third, we extended the model developed by Konuk (2015) by investigating the role of product quality on purchase intention of perishable goods, such as near-expired bread.

Based on the results, we could offer several managerial implications for bread marketers. First, marketers should sell near-expired food at lower price and attract price conscious consumers who focus exclusively on paying low prices. It is reasonable that the near-expired bread should be sold at lower price because of their decreasing quality. Moreover, marketers should identify and target this price conscious segment who would like to buy near-expired bread because of the cheaper price. Second, in selling near-expired bread, marketers have to pay attention to the perception of the bread quality. They have to make sure that the bread looks fresh and tasty. In this case, the bread packaging and bread storage are relevant issues in maintaining the bread quality. Third, marketers of the bread industry should see "bread sale" as an effective tool to improve purchase intention and to reduce bread waste at the same time. Marketers should also be well-informed of the framing of bread sales. They should stress on the value of the bread which shows that the near-expired bread on sale is not only more affordable but also safe to consume. In other words, marketers should offer near-expired bread at a reasonable price while maintaining the quality image of the bread. By using this approach, consumers will perceive a higher value from the product offering hence a greater likelihood to purchase the near-expired bread.

This study has some limitations due to relatively small samples of Indonesian-based near-expired bread consumers. To investigate near-expired bread consumers in Indonesia proves to be challenging due to the fact that our potential respondents perceive this behavior as shameful or socially undesirable. Future research could replicate this study and add more respondents to improve the validity of our findings. Future research could also investigate the purchase intention of near-expired bread in different countries and try to correlate it with the amount of bread waste or food waste in general. Moreover, future research could investigate whether the willingness to purchase near-expired bread is stronger with the growth of consumer awareness on the cost of food waste and the harmful effects of food waste on the environment.

We believe that Indonesian consumers who buy and consume near-expired bread also contribute to environmental preservation through food waste reduction. This is

one of the characteristics of socially responsible consumers and green consumers who buy products that pay attention to environmental aspects. In other words, they possess conserving behavior (Berné-Manero, Pedraja-Iglesias, and Ramo-Sáez 2014; Do Paço et al. 2013) and avoid consumption that causes unnecessary waste (Do Paço and Raposo 2008). Future research needs to investigate and provide empirical evidence whether socially responsible consumers or green consumers are the target market of near-expired bread or near-expired food in general.

6 Conclusion

The objective of this research was to reveal factors affecting consumer's purchase intention of near-expired bread. This research also investigated the effect of product quality perception on purchase intention of near-expired bread. The findings of this study suggest that price consciousness and product quality have positive effects on sale proneness and that the three aforementioned variables have positive effects on purchase intention of near-expired bread. By understanding factors affecting consumer intention to purchase near-expired bread, marketers could optimally sell their bread as well as preventing bread waste at the same time. They could plan the quantity of bread to produce on a particular day and accurately forecast the proportion of bread that will be sold on sale period or hours. Therefore, allocating certain hours for bread sale is a good way of tossing out near-expired bread without damaging the environment while at the same time recouping financial losses due to production excess.

Since food waste is a worldwide trend issue, the result of this study is expected not only beneficial for food marketers but also for policy regulators around the world in designing public policy related to food waste prevention. Considering that consumers have willingness to buy near-expired bread, regulators could design public policy which encourage consumers to contribute to food waste prevention programs by purchasing and consuming near-expired bread. Regulators could initiate regular campaigns in this area by highlighting that consuming near-expired bread is part of preserving our planet activities. Furthermore, this study also enhanced our understanding on consumer behavior in general and consumer food wasting behavior in particular. Therefore, by reducing domestic food waste, Indonesia and other main contributors of global food waste could recover billions of dollars in food waste and improve their environments in the future.

Compliance with ethical standards

Conflict of interest   The authors declare that there is no conflict of interest regarding the publication of this article.

Appendix

Price consciousness scale (adapted from Lichtenstein et al., 1993; α 0.898)

1. I am willing to give an extra effort to find lower prices.
2. I will shop at more than one bakery shop to take advantage of low prices.
3. The money saved by finding low prices is usually worth the time and effort.
4. I would shop at more than one bakery shop to find low prices.
5. The time it takes to find low prices is usually worth the effort.

Product quality scale (adapted from Walsh et al., 2012; Vo and Nguyen, 2015; α 0.943)

1. The near-expired bread tastes good.
2. The near-expired bread has a good color.
3. The near-expired bread is well made.
4. The near-expired bread is acceptable in quality

Sale proneness scale (adapted from Lichtenstein et al., 1993; α 0.902)

1. If the bread is on sale, that can be a reason for me to buy it.
2. When I buy the bread that is on sale, I feel that I am getting a good deal.
3. I have a favorite bread, but most of the time I buy the bread that is on sale.
4. One should try to buy the bread that is on sale.
5. I am more likely to buy the bread that is on sale.
6. Compared to most people, I am more likely to buy the bread that is on sale.

Purchase intention scale (adapted from Grewal et al., 1998; α 0.932)

1. I would purchase the near-expired bread.
2. I would consider buying the near-expired bread at this price.
3. The probability that I would consider buying the near-expired bread is high.

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