Reducing food waste: How to stimulate purchase intention of expiration date-based priced?

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Abstract. This research aims to analyze how price consciousness and sale proneness influence consumers' purchasing intentions for EDBP sold in supermarkets and minimarkets to reduce food waste due to unsold products. Research data was obtained using a convenience sampling approach to obtain respondents according to the criteria and an online questionnaire was used to obtain respondents' answers. The research respondents were 342 consumers of EDBP at the Papaya supermarket. The research hypothesis was tested using the Structural Equation Model using AMOS. The results of this research prove empirically that price consciousness influences sale proneness. Other results show that price consciousness has no effect on purchase intentions and sale proneness has no effect on purchase intentions. This research uses a price awareness approach to examine how pricing strategies can play a role in reducing food waste which then influences the achievement of SDGs 12.

1 Introduction

The problem of food waste has become an old problem that must be resolved immediately and addressed across the food supply chain. Food waste refers to food that is discarded at the retail, food service provider, and consumer levels. This action simultaneously results from retailers, food services, and consumers' decisions [1] where 80% comes from household consumption. Because Indonesia is one of the countries with the largest population, Indonesia is the largest contributor to food waste in Asia and is even the 4th largest producer in the world.

Throwing away food destroys precious resources, and causes excess carbon dioxide emissions that exacerbate the climate crisis while further straining food security. It needs to be understood that food waste has a significant impact on several sectors such as the economy, environment, and society. To tackle food waste, we must involve all actors who can bring about change, from farmers to retailers, central government, multilateral institutions, NGOs, and communities [2, 3]. However, the trend shows that every year food

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waste is increasing and even 44% is leftover food that is still fit to eat [1]. Efforts to reduce food waste have become a global target, as stated in SDGs 12. Efforts to reduce food waste need to be carried out by various parties regardless of how little or how much waste [4, 5]. Manufacturers and retailers play an important role, especially in food waste actions, in the rise and fall of food waste [6]. The processes they go through will play a role in the loss and waste of food. The food waste produced can come from leftover food and beverage products that are not sold. Like it or not, the ability of business people to sell their products affects the food waste produced. Promotions are widely known as one way to attract consumer purchasing intentions. Previous research has researched and proven empirically how promotions influence consumer purchasing intentions. One way of promotion that can be used by business people is a pricing strategy. Research in pricing strategy has been well-accepted [7-9], and this can be a solution for food manufacturers and retailers to increase their sales as well as reduce food waste [1]. Unfortunately, the topic of research on pricing strategies for reducing food waste is still rare. Consumers tend to be interested in buying products at lower prices than normal prices [8]. But they are also aware of the price differences offered in the promotion of a product. Awareness of lower prices influences consumers' sale proneness, making them tempted to buy products due to discounts [10]. However, it should be noted that consumer awareness of price differences can also influence consumers' perceived risk of products that are on sale. Especially in food and beverage products, consumers can have a perception of risk when buying products whose prices are lower than the normal price. This phenomenon itself is often seen in supermarkets and minimarkets which offer lower prices for products that are close to the "best before", namely expiration date-based priced (EDBP). Several products are usually sold at prices based on their expiration date, such as cooked food (sushi, rice box, etc.). The question is, can EBDP increase consumer purchase intentions, even though consumers have a perceived risk in consuming the product? The balance between price consciousness and perceived risk needs to be further explored as a strategy to reduce food waste while considering ESG objectives. This issue is interesting for supermarket business strategies because online businesses steal from their customers. Papaya Supermarket as one of the large supermarkets in Indonesia provides many fresh products, including food and drinks. Over the years this supermarket has consistently provided discounts on these products at certain times (closer to midnight). The results of this research will contribute not only to pricing strategies theory, especially EBDP but also to reducing food waste as an ESG issue.

1.1 Price consciousness

In the competitive business era, understanding consumer behavior is crucial for business people. One important aspect that can be utilized by business people is price consciousness, namely consumer awareness of differences in product prices. Knowing how consumers respond to price differences is a strategic step for business people. Consumers' price consciousness can influence their evaluation of product promotions [10]. Business people can use price consciousness to attract consumers' purchasing intentions who tend to be attracted by low prices [11]. A number of studies have confirmed that price consciousness has a significant impact on consumer purchasing intentions [9, 12, 13]. Pricing strategy is the key to utilizing price consciousness. Business people can determine the right price discount based on their consumer type. [10]. Success in targeting price-conscious consumers can bring significant benefits to business actors [14]. Marketing practices that target consumers who are sensitive to lower prices can also support business sustainability [11]. Understanding that price is the main driver for consumer purchasing intentions is the basis for an effective marketing strategy [8, 9].
It should be emphasized that consumer perceptions of price can vary. Factors such as discount level and social class can influence this perception [13, 15]. However, there are situations where price consciousness does not always have a positive impact on consumer purchasing intentions, especially for consumers with high knowledge. Hansen (2013) shows that price consciousness can have a negative impact on purchase intentions among consumers with high knowledge. Price sensitivity can be an opportunity for food and beverage businesses who want to increase sales of their products. Consumers who are responsive to price tend to respond well to promotions and even participate in them [17]. Although price consciousness is widely understood to have an influence on purchase intentions, there is previous research which shows that price consciousness does not always have an influence on purchase intentions [18]. This research aims to analyze how price consciousness influences both sale proneness and consumer purchase intentions for EDBP in supermarkets.

H1: Price consciousness has a significant influence on sale proneness in Papaya supermarket EDBP

H2: Price consciousness has a significant influence on purchase intention for Papaya supermarket EDBP

1.2 Sale proneness

With consumers increasingly finding it easier to access information, consumers are constantly exposed to various information, including discounts and price offers, which are more easily accessed through various communication platforms and social media. Promotional strategies generally used by companies often involve offering consumers to get products at lower prices. Price consciousness, or awareness of prices, has been proven to have a significant effect on sales proneness [17]. Consumers who are price-conscious tend to have a tendency to buy products that are offered with promotions or discounts. Previous research shows that consumers who are sensitive to price tend to respond well to promotions and are even willing to participate in them [17]. Sale proneness has a positive influence on purchase intention through attitude, which is shown by consumers who tend to look for offers developing a positive attitude towards promotions and ultimately showing higher purchase intention [19].

By understanding the importance of sale proneness, business people can design sales strategies that are attractive to consumers who tend to look for deals [20]. Sale proneness reflects consumers' tendency to look for and respond to offers, discounts, or promotions that can add value to their purchases. However, it is important to note that sales promotion targeting must take into account specific demographic characteristics [21]. Specific demographic characteristics, such as age, gender, income, and shopping preferences, can influence how consumers respond to sales promotions. Sales promotion targeting must be tailored to a deep understanding of the target demographic. However, Konuk’s [12] research shows that sale proneness does not always have a significant influence on purchase intentions. This shows the complexity of the relationship between sale proneness and consumer behavior. This research aims to identify how sale proneness influences consumer purchase intentions for EDBP in supermarkets.

H3: Sale proneness has a significant influence on purchase intention for Papaya supermarket EDBP

2 Method

This research uses a quantitative approach to obtain respondents' answers to answer the research hypothesis. Using convenience sampling techniques, this research then distributed questionnaires to respondents who met the respondent criteria: 1) have purchased EDBP at
Papaya; 2) buy EDBP on sale at Papaya. The research questionnaire was created using Google Form so that the questionnaire could be distributed to respondents online. Respondents were consumers from Papaya supermarkets. A total of 342 respondents filled out a questionnaire which was distributed using a Google Forms link, the results of which will then be processed using SEM-AMOS to get answers to the research hypothesis. Questionnaires distributed to respondents were used to determine the characteristics of respondents and their responses to price consciousness, sale proneness and purchase intention. Respondent characteristics are included to determine their age, education, income, and experiences. The price consciousness and sale proneness variable adopted from Lichtenstein et al. [22] research has 3 and 4-question items. The purchase intention variable adopted from Konuk’s (2015) research has 3 question items [12]. This research questionnaire uses a 1-5 Likert scale to represent respondents' answers. The Likert scale used uses 1 as a "strongly disagree" response to 5 as a "strongly agree" response.

### Table 1. Item Measurements

<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price Consciousness</td>
<td>• I am willing to spend more effort to find EDBP at lower prices</td>
</tr>
<tr>
<td></td>
<td>• I will shop at more than one supermarket to find cheaper EDBP</td>
</tr>
<tr>
<td></td>
<td>• It's usually worth the time to find cheaper EDBP</td>
</tr>
<tr>
<td>Sale Proneness</td>
<td>• If EDBP is on sale, this can be a reason for me to buy it</td>
</tr>
<tr>
<td></td>
<td>• When I buy EDBP that is on sale, I feel like I'm getting a good deal</td>
</tr>
<tr>
<td></td>
<td>• Even though I have favorite foods, I often buy EDBP that are on sale</td>
</tr>
<tr>
<td></td>
<td>• One should try to buy EDBP that is on sale</td>
</tr>
<tr>
<td>Purchase Intention</td>
<td>• I am willing to buy EDBP that is on sale in supermarkets in the future</td>
</tr>
<tr>
<td></td>
<td>• I plan to buy EDBP that is on sale at the supermarket</td>
</tr>
<tr>
<td></td>
<td>• I will try to buy EDBP at the supermarket</td>
</tr>
</tbody>
</table>

### 3 Results and Discussion

#### 3.1 Respondent characteristic

The respondents for this study consisted of 37.7 percent men and 62.3 percent women. In general, research respondents were aged 18 to 25 years (62.9%), 26 to 35 years (33.9%), 36 to 45 years (2.6%), and 46 to 55 years (0.6%). Each respondent had a variety of income, from less than 1 million (15.8%), 1 million to 3 million (48%), 3 million to 5 million (27.2%), and more than 5 million (9.1%). Most respondents have visited the Papaya supermarket, although not regularly every month (88.9%). Most respondents also think that a reasonable spending limit for buying snacks is 20 thousand to 50 thousand rupiah (48%).

#### 3.2 Validity, reliability, and normality test

Table 2 shows the research variables, the number of items representing each variable, the loading factor, CR and AVE values for each variable. Validity testing is seen through the loading factor value, which can be declared valid if the value is above 0.5[23].
Table 2. Validity and Reliability Test

<table>
<thead>
<tr>
<th>Variable</th>
<th># of Items</th>
<th>Loading Factors</th>
<th>CR</th>
<th>AVE</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price Consciousness</td>
<td>3</td>
<td>0.674-0.729</td>
<td>0.752</td>
<td>0.502</td>
<td>Valid and Reliable</td>
</tr>
<tr>
<td>Sale Proneness</td>
<td>4</td>
<td>0.692-0.735</td>
<td>0.800</td>
<td>0.501</td>
<td>Valid and Reliable</td>
</tr>
<tr>
<td>Purchase Intention</td>
<td>3</td>
<td>0.674-0.734</td>
<td>0.751</td>
<td>0.501</td>
<td>Valid and Reliable</td>
</tr>
</tbody>
</table>

Reliability testing, on the other hand, is seen from the CR and AVE values of each variable. When the CR value is above 0.7 and the AVE value is above 0.5, it can be declared reliable [24]. As seen in the table above, the loading factor and AVE values for each variable are above 0.5 and the CR value is above 0.7. Overall, it can be concluded that the results of this test prove that the research construct built into this study is valid and reliable. From here analysis can then be carried out at the next stage. For the normality test, where large amounts of research data are used, it is recommended to use kurtosis values for each variable used [25]. In this research, the kurtosis values for the variables are of concern to determine whether the data is normal or not. If the Kurtosis value is greater than 3.0, it indicates that the variable is not normally distributed [26]. Our research did not find the kurtosis value for each variable above 3.0. It can be concluded that this research data meets the normal criteria.

3.3 Model fit test

Table 3 shows the Fit model test using the CMIN/DF, GFI, AGFI, CFI, and RMSEA parameters. Each parameter has an assessment standard to be said to be accepted as a fit model. Of the six parameters used in this research, these six parameters were included in the model fit assessment. This research model can fulfill goodness-of-fit and be used to answer research hypotheses.

Table 3. Model Fit Test

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Accepted Fit</th>
<th>Results</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMIN/DF</td>
<td>&lt; 3 = acceptable fit</td>
<td>1.087</td>
<td>Model Fit</td>
</tr>
<tr>
<td>GFI</td>
<td>1 = perfect fit</td>
<td>0.980</td>
<td>Model Fit</td>
</tr>
<tr>
<td>AGFI</td>
<td>&gt; 0.9 = acceptable fit</td>
<td>0.965</td>
<td>Model Fit</td>
</tr>
<tr>
<td>CFI</td>
<td>1 = perfect fit</td>
<td>0.998</td>
<td>Model Fit</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt; 0.05 = reasonable fit</td>
<td>0.016</td>
<td>Model Fit</td>
</tr>
</tbody>
</table>

3.4 Respondent characteristic

Table 4 shows the results of the research hypothesis testing. There are 3 hypotheses tested related to the interaction of the 3 research variables. The research hypothesis is accepted if the P value is less than 0.05. H1 predicts that price consciousness influences sale proneness, the results of hypothesis testing show a value of 0.000.

Table 4. Model Fit Test

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price Consciousness --&gt; Sale Proneness</td>
<td>1.054</td>
<td>0.099</td>
<td>10.655</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>Price Consciousness --&gt; Purchase Intention</td>
<td>-1.202</td>
<td>3.567</td>
<td>-0.337</td>
<td>0.736</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Sale Proneness  --&gt; Purchase Intention</td>
<td>2.121</td>
<td>3.346</td>
<td>0.634</td>
<td>0.526</td>
<td>Not Significant</td>
</tr>
</tbody>
</table>
These results indicate that H1 is accepted, price consciousness has a significant effect on sale proneness. On the other hand, H2 and H3 have a P value of more than 0.05, making them both rejected. H2 predicts that price consciousness influences purchase intention, the results of hypothesis testing show a value of 0.736. H3 predicts that sale proneness influences purchase intention, the results of hypothesis testing show a value of 0.526. So overall, of the 3 research hypotheses, 1 hypothesis was accepted and 2 hypotheses were rejected.

3.5 Discussion

3.5.1 The relations between variables

The results of this research provide empirical evidence that can be of interest to future researchers. From the framework that has been created, price consciousness is predicted to have a significant influence on sales proneness and consumer purchase intentions, as in previous studies [12, 27, 28, 29]. However, the results of this research provide different results, where price consciousness influences sale proneness, while on the other hand, it does not have a significant influence on consumer purchase intentions. On the other hand, sale proneness also has no effect on consumer purchase intentions. This result is different from previous studies which showed a significant influence of sale proneness on purchase intention [17, 19, 30].

Looking at previous research, there is research that finds that price consciousness has no effect on consumer purchasing intentions [31]. In this research, consumer price consciousness has no influence on product purchase intentions, which are thought to be related to the value obtained from the purchase. Consumers who are aware of the price of the product they are going to buy do not necessarily have the urge to buy that product. In fact, consumers who are aware that the price is lower tend to reduce their likelihood of purchasing the product [14]. Price reductions that are lower than usual are followed by consideration of the value that consumers get when buying the product [32]. Consumers estimate a decrease in the value of the product along with the gap between the normal price and the price when it is on sale. In the context of this research, EDBP that is on sale close to midnight certainly provides a "signal" to consumers as to why the product is still worth buying. This phenomenon shows that there is a "value threshold" that is used as a measuring tool for consumers when looking at EDBP on sale. Based on this research which empirically proves that there is a relationship between price consciousness and sale proneness, this is linear with the findings of previous researchers.

For the sale proneness, consumers' susceptibility to sales will encourage them to buy products that are on sale. Including food products, the practice of discounts or promotions has become a common method used by food and beverage businesses. Several other studies show the same results, where sale proneness has no effect on consumer purchase intentions [12, 33]. Consumers see products that are on sale as having low value, or low quality, so they are hesitant to buy the product. [12]. Offering a lower price is then seen by consumers as a signal that the product must be sold immediately, which is then interpreted as meaning that the quality of the product has decreased even though it is still at a safe level for consumption. If you look at the majority of respondents who are undergraduate graduates, as well as the Papaya supermarket market which is middle class, the assessment of food quality tends to be at a standard that tends to be high. It should be noted that there is a possibility of an increase in the frequency of purchases during promotions, this could be in the form of consumers who previously purchased the product trying to take advantage of this promotional opportunity [33]. So, even though business actors have succeeded in increasing the volume of purchases, this does not necessarily mean that the market they reach is increasing.
3.5.2 What actually happened? The “Mid-High” community and the “Invincible” barrier

Looking at the overall results of this research, there is actually an interesting phenomenon in the sales of EDBP at Papaya supermarket. Considering that the choice of supermarkets in Indonesia is diverse, Papaya is the supermarket choice for the upper middle market. This context is seen as what kind of market sees the sale of EDBP in the Papaya supermarket. Previously, it was seen again that the aim of this research was to encourage ways to reduce food waste through pricing promotions, by reducing prices on food and beverage products so as to increase consumers' purchasing intentions to buy these products. As a result, food waste will be reduced because the products are sold, and business people will also gain profits through higher product sales.

The research results show that implementing a pricing strategy alone is not able to influence consumers' purchasing intentions to buy EDBP, especially in the context of the respondents of this study. Reflecting on the context of reality in the field, there are 2 important ideas as to why this phenomenon occurs. First, the characteristics of Papaya supermarket consumers who are upper middle-class economic groups have views regarding the "value" of EDBP. This shows the importance of conveying the message in promotions that the product is still suitable for consumption, referring to the quality that is still safe and delicious for consumption, in addition to the promotional message of lower prices. Second, there is a group of lower-middle-class consumers who are encouraged to take advantage of this EDBP sale offer but are hampered by "barriers" to access. This is shown in this research by the characteristics of respondents from the middle to lower economic groups who have taken advantage of sales of EDBP from the Papaya supermarket. Often promotions become their initial encouragement to have the courage to buy a product, after which they no longer have the courage to visit again. Moreover, the requirements for getting this sale also require consumers to create a membership, so consumers cannot buy it online if they want to get fresh EDBP sales offers.

Promotion is a strategy that can be used to increase product sales. However, it also needs to be understood that promotions can encourage an increase in food waste if consumers buy food and beverage products that exceed their capacity. This phenomenon occurs through society's values which tend to be "more is better than less" and they don't want to miss promotions. Because they are purchased in excess, it is very possible that food and beverage products purchased through promotions will still become food waste [1]. Moreover, considering that the Papaya supermarket market is generally middle economy with a large disposable income, it's possible for food purchased from promotions to become "disposable".

Therefore, efforts to reduce food waste for food and beverage businesses, especially supermarkets and minimarkets that sell EDBP, need to plan their promotions appropriately. First, ensure that the promotional messages conveyed to consumers contain information on price reductions and product quality [32]. At this stage, business actors need to formulate promotional messages to educate consumers that food is still suitable for consumption, considering that there are misconceptions among consumers regarding the expiration date of food products. Second, the message is conveyed to the right consumers, especially those in the lower middle class who are aware of price differences and are susceptible to promotions [13, 34]. Third, reduce barriers for consumers to access EDBP sales. The more consumers who participate can be a point for other consumers to assess the quality of the product and take part in the product sale opportunities offered [30]. Fourth, provide purchasing "limits" to consumers within reasonable standards so that the food products purchased do not become mere moments of food waste transfer. So promotions can not only bring profits to business people but can also reduce food waste generated in the food and beverage business.
4 Conclusion

This research aims to analyze the influence of the pricing of EDBP on consumers' price consciousness regarding their sale proneness and purchase intentions. The results of this research provide empirical evidence that consumer price consciousness regarding EDBP influences sales proneness, but does not influence consumer purchase intentions. Other findings show that sale proneness has no effect on consumers' purchase intentions for EDBP. Consumers in supermarkets are aware that the EDBP offered to them are sold at lower prices, and this makes them susceptible to sales on these products, but this is not enough to encourage their purchase intentions due to perceptions of decreased product quality and their assumptions that the product is no longer suitable. Messages are needed to guarantee that the quality of food products is still suitable for enjoyment so that it can increase consumers' purchasing intentions to buy products that have an impact on reducing food waste due to the food and beverage business process from unsold products. Business actors indirectly carry out their obligations to support the achievement of the SDGs 12 – responsible consumption and production. It is realized that this research, which is able to provide interesting results, also has limitations that can be the focus of further research. First, this research focuses on just one supermarket in an effort to test the food sale scheme that is carried out regularly to consumers. Research objects that are more easily accessible to a wider range of consumers will produce more interesting analysis in finding ways to reduce food waste in the food and beverages business process. Second, there are variables that can be developed into the model to capture a more concrete reality for consumers. Variables such as perceived value and perceived risk, for example, appear as potential variables that consumers consider when wanting the product.

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