The Effect of Packaging of Fruit and Vegetable on Customer Behavior

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ABSTRACT

The present research tries to study the effectiveness of fruit and vegetable packaging in Purchasers Behavior. Research method of this research is field and statistical society of this research is all purchasers of fruits and vegetables in Tehran and questionnaire has been used for collecting the information. In present research, the effect of packaging on consumer’s purchase behavior has been analyzed by using SPSS software. Finally, the results show that all hypotheses have been accepted and packaging of fruits and vegetables has effects on consumer’s behavior.

INTRODUCTION

The losses fruit and vegetable harvest, before they consumed by consumers, varies between 20-50%. Naturally, fruit and vegetable humidity varies 70-95% and balanced humidity ERH is above 98%. Keeping vegetables in normal atmosphere condition makes them dry and wither fast. Therefore the main aim of packaging fruits and vegetables is protecting the contents inside of package during storing, transporting, distribution against decay which it may be physical, chemical or biological action. Packaging can be done in production, processing steps or in distribution centers, although this is done in final steps of production, storing, marketing and distribution, however it plays an important role in safe delivering of package contents from production to consumption. The production increase can be effective when the products have high quality standard under healthy condition and economical price are available for customers. As noted, a lot of fruits and vegetables are decayed during providing and distribution, and are placed under standard limit. This rate of loss decreased the products and increases prices. Packaging losses are related to unsuitable styles or methods and insufficient transportation devices or equipments. Packaging is defined as reservation of products in bags, boxes, cups, trays, cans, tubes, bottles, and etc which have the same performances as prevention from pollution, protection or caring and facilitation or easiness in transformation and moving. Fast development has been made in new technologies of processing or packaging food since 1970s. Fruits and vegetables are of the most important agricultural products of Islamic Republic of Iran. But, unfortunately fruits and vegetables of Islamic Republic of Iran have not been able to get a good placement or status in world market. We can mention some of problems: Selecting unsuitable cultivars, lack of accuracy in harvesting product’s washing, cleaning, antisepticising, packaging, advertizing, and marketing. (www.persiapack.ir)

Literature review: packaging functions and elements

Prendergast and Pitt (1996) review the basic functions of packaging, and define them by their role in either logistics or marketing. The logistical function of packaging is mainly to protect the product during movement through distribution channels. In the marketing function, packaging provides an attractive method to convey messages about product attributes to consumers at the point of sale. It may be difficult to separate these two package functions, as they are usually needed. The package sells the product by attracting attention and communicating, and also allows the product to be contained, apportioned, unitized, and protected. Whatever be the logistics considerations, packaging is one key food product attribute perceived by consumers. It cannot

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escape performing the marketing function, even if a company does not explicitly recognize the marketing aspects of packaging. The package is a critical factor in the decision-making process because it communicates to consumers. Intention to purchase depends on the degree to which consumers expect the product to satisfy them when they consume it [10]. How they perceive it depends on communication elements, which become the key to success for many marketing strategies. The package's overall features can underline the uniqueness and originality of the product. In addition, quality judgments are largely influenced by product characteristics reflected by packaging. If it communicates high quality, consumers assume that the product is of high quality. If the package symbolizes low quality, consumers transfer this low quality perception to the product itself. The package communicates favorable or unfavorable implied meaning about the product. Underwood et al. [24] suggest that consumers are more likely to spontaneously imagine aspects of how a product looks, tastes, feels, smells, or sounds while they are viewing a product picture on the package. Consumer decision-making can be defined as a mental orientation characterizing a consumer's approach to making choice [11]. This approach deals with cognitive and affective orientations in the process of decision-making. Four main packaging elements potentially affect consumer purchase decisions, which can be separated into two categories: visual and informational elements. The visual elements consist of graphics and size/shape of packaging, and relate more to the affective side of decision-making. Informational elements relate to information provided and technologies used in the package, and are more likely to address the cognitive side of decisions. Most FMCG are low involvement products. In low involvement, "consumers do not search extensively for information about the brands, evaluate their characteristics, and make a weighty decision on which brand to buy" [9]. One reason for this is low risk [3,14], i.e. these products are simply not very important. The lack of substantial evaluation often results in the inability to distinguish much difference among leading brands [12]. A common result is relatively weak "habit" brand loyalty. Thus, when consumers find a brand which meets their standards, they tend to stay "satisfied" with it, especially, if they are constantly reminded of the brand. But they are not very committed, and substitute easily when it is not available. Such habit loyalty is fairly common in the West, e.g. IGD (2002a) notes that about one-third of women shoppers, and slightly fewer men, buy food products through habit. It is also quite common in Thailand and more broadly in Asia (Speece, 1998, 2003). Survey data from Thailand indicate that packaging plays a strong role in reminding consumers about the brand [21], i.e. it helps to reinforce habit loyalty. Some observers, though, note that not all consumers view grocery shopping as a low involvement activity. Beharrell and Denison [1] show a range of involvement among European consumers. Those with higher involvement tend to be more strongly brand loyal, including willingness to postpone purchase or go to another store if the brand is not available. In Thailand, about 20–40 percent of consumers for most FMCG show this level of loyalty, and will postpone or search rather than simply switch to a substitute (Speece, 1998, 2003).

Clearly, consumer use of packaging elements is quite an important issue for low involvement products - generally, informational elements require more mental effort to process than do visual elements, which evoke more of an emotional response. Some consumers are not willing to put forth this small effort, and food products which is of truly low involvement for them. Others may consider the product more carefully, so that involvement level might shift the package elements which are most critical. We look at these various elements in more detail in the remainder of this section, to examine how consumers are likely to use each one.

**Visual elements:**

**Graphics and color:**

Graphics includes layout, color combinations, typography, and product photography, all of which create an image. For low involvement, there is a strong impact from marketing communications, including image building, on consumer decision-making. Evaluation of attributes is of less importance in low involvement decisions, so graphics and color become critical [5]. For many consumers in low involvement, the package is the product, particularly because impressions formed during initial contact can have lasting impact. As the product attribute which most directly communicates to the target consumer [15], the design characteristics of the package need to stand out in a display of many other offerings. Many consumers today shop under higher levels of perceived time pressure, and tend to purchase fewer products than intended [7]. Products often appear to be chosen without prior planning, representing a form of impulse buying [6]. A package that attracts consumers at the point of sale will help them make decisions quickly in-store. As the customer's eye tracks across a display of packages, different new packages can be noticed against the competitors. However, eye movement does not necessarily mean attention. When scanning packages in the supermarket, the differential perception and the positioning of the graphics elements on a package may make the difference between identifying and missing an item [7]. In psychology research, brain laterality results in an asymmetry in the perception of elements in package designs [18]. The recall of package elements is likely to be influenced by their lateral position on the package, as well as by factors such as font style, size, and color. Recall is better for verbal stimuli when the copy is on the right hand side of the package, and better for non-verbal stimuli when it is on the left hand side. This may imply that, in order to maximize consumer recall, pictorial elements, such as product photography, should be positioned on the left hand side of the package. Consumers also learn color associations, which lead them to
prefer certain colors for various product categories [5]. Using color as a cue on packaging can be a potentially strong association, especially when it is unique to a particular brand. However, people in different cultures are exposed to different color associations and develop color preferences based on their own culture's associations. Simply taking the colors of a particular logo, package, or product design from one market to another should only be done under a thorough understanding of how colors and color combinations are perceived in each location [13].

Packaging size and shape:

Package size, shape, and elongation also affects consumer judgment and decisions, but not always in easily uncovered ways. Consumers appear to use these things as simplifying visual heuristics to make volume judgments. Generally they perceive more elongated packages to be larger, even when they frequently purchase these packages and can experience true volume. This implies that disconfirmation of package size after consumption may not lead consumers to revise their volume judgments in the long term, especially if the discrepancy is not very large [17]. Different sizes also appeal to consumers with somewhat different involvement. For example, low price for some low involvement products, such as generics, is made possible through cost savings created by reduced packaging and promotional expenses. Generics are usually packaged in larger sizes, which communicates to consumers who are specifically looking for good deals. Such consumers find the low price of the generics, in the right size of packaging, offers excellent value for money [16]. In addition, this could imply that when product quality is hard to determine, as with generics, the packaging size effect is stronger.

Consumer Behavior:

The study of consumer behavior focuses on how individuals make decisions to spend their available resources (time, money, effort) on consumption-related items [20]. The field of consumer behavior covers a lot of ground. According to Solomon [19], consumer behavior is a study of the processes involved when individuals or groups select, purchase, use, or dispose of products, services, ideas, or experiences to satisfy needs and desires. The official definition of consumer behavior given by Belch [2] is ‘the process and activities people engage in when searching for, selecting, purchasing, using, evaluating, and disposing of products and services so as to satisfy their needs and desires’. Behavior occurs either for the individual, or in the context of a group, or an organization. Consumer behavior involves the use and disposal of products as well as the study of how they are purchased. Product use is often of great interest to the marketer, because this may influence how a product is best positioned or how we can encourage increased consumption.

Research objectives:
- Identifying packaging needs of consumers
- Making job, especially in secondary industries of fruits and vegetables.
- Bringing foreign exchange and promoting the fruit and vegetable position in non oil export of agricultural section.
- Suitable identification of packaging features based on consumer’s behavior
- Making a suitable position for fruits and vegetables of Iran in international level and trying to fix their position in world market.
- Designing suitable packaging for reaching green design

Research hypotheses:
Main hypothesis
- There is a meaningful relationship between packaging physical features and fruit and vegetable consumer’s behavior.
- There is a meaningful relationship between packaging size and fruit vegetable consumer’s behavior.
- There is a meaningful relationship between packaging material and fruit and vegetable consumer’s behavior.
- There is a meaningful relationship between packaging weight and fruit and vegetable consumer’s behavior.
- There is a meaningful relationship between packaging physical shape of fruit and vegetable consumer’s behavior.

Research method:
This research follows measurable – descriptive research generally and naturally and it is of application type. We can obtain the sample volume based on being limited or unlimited of statistical society, since the statistical society in this research can include all citizens of Tehran, so we can calculate the number of sample volume from this formula.
The sampling method is simple random sampling which after clarification of sample volume; the samples have been selected randomly. According to unknown statistical society following formula has been used for estimation of sample volume:

\[
n = \left( \frac{Z_{\alpha}}{d} \right)^2 \times P(1 - p)
\]

Where

n: sample volume  
p: ratio in society  
q: 1-P  
d: maximum estimated error of ratio in society since specific information about p value, we consider its value 0.5 which maximum value of sample volume is obtained. According to 1-α=0.99, d=0.05 165 value is obtained for sample which 168 questionnaires have been distributed and collected.

Finally, 168 questionnaires have been distributed between statistic societies. We can claim that if we select 168 samples, we will have 99% reliability level which obtained result of research will have 5% difference with real value of the statistic society.

Data analysis:

Two descriptive and inferential statistic methods for testing and analyzing processed data will be used and its base is SPSS software. Descriptive statistics is used for summarizing collected data and recognizing the society and inferential statistics is used for analyzing existent data in sample data and measuring lack of certainty in inferential.

Hypotheses test:
Hypothesis 1 test:
Hypothesis: There is not a meaningful relationship between packaging dimensions and fruit and vegetable consumer’s behavior.

Table: Hypothesis 1 test

<table>
<thead>
<tr>
<th>Hypothesis 1</th>
<th>Kolmogorov-Smirnov test for testing normality</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.026</td>
<td>Kolmogorov-Smirnov -statistics</td>
</tr>
<tr>
<td>0.001</td>
<td>Meaningful level</td>
</tr>
<tr>
<td>165</td>
<td>Number</td>
</tr>
</tbody>
</table>

Orders and frequencies of packaging from dimensional aspect

<table>
<thead>
<tr>
<th>Average of orders</th>
<th>N</th>
<th>Packaging</th>
<th>Purchase behavior</th>
<th>Kruskal-Wallis and Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.45</td>
<td>91</td>
<td>40×30</td>
<td>71.115</td>
<td>Chi-Square</td>
</tr>
<tr>
<td>54.03</td>
<td>42</td>
<td>50×30</td>
<td>2</td>
<td>Freedom degree</td>
</tr>
<tr>
<td>27.12</td>
<td>32</td>
<td>50×40</td>
<td>0.000</td>
<td>Asymp.sig</td>
</tr>
<tr>
<td>165</td>
<td>Total</td>
<td>40×30</td>
<td>2</td>
<td>Result</td>
</tr>
</tbody>
</table>

Hypothesis:
There is a meaningful relationship between packaging dimensions and fruit and vegetable consumer’s behavior.

we needed to know that whether data related to this hypothesis follow normal distribution or not?

For this reason we used Kolmogorov-Smirnov. As we observe in table, the obtained meaningful level or sig value is 0.001 which is less than 0.05, therefore we can say by 95% certainty that data of this hypothesis don’t follow normal distribution.

Hypothesis 2 test:
Hypothesis: There is not a meaningful relationship between packaging material and fruit and vegetable consumer’s behavior

Hypothesis: There is a meaningful relationship between packaging material and fruit and vegetable consumer’s behavior.
As we observed in hypothesis 1 analysis, data related to consumer’s purchase behavior don’t follow normal distribution in 95% certainty level (Kolmogorov-Smirnov test). Since the variable does not follow normal distribution, it is better that non parametric Kruskal-Wallis and Chi-square test to be used for being meaningfulness of hypothesis.

**Hypothesis 3 test:**

Hypothesis: There is not a meaningful relationship between packaging weight and fruit and vegetable consumer’s behavior.

Hypothesis: There is meaningful relationship between packaging weight and fruit and vegetable consumer’s behavior.

As we observed in hypothesis 1 analysis data related to consumer’s purchase behavior don’t follow normal distribution in 95% certainty level.

**Table: Hypothesis 3 test**

<table>
<thead>
<tr>
<th>Average of orders</th>
<th>N</th>
<th>Capacity</th>
<th>Purchase behavior</th>
<th>Kruskal-Wallis and Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>98.59</td>
<td>44</td>
<td>250</td>
<td>29.10</td>
<td>Chi-square</td>
</tr>
<tr>
<td>78.21</td>
<td>62</td>
<td>500</td>
<td>3</td>
<td>Freedom degree</td>
</tr>
<tr>
<td>70.01</td>
<td>32</td>
<td>800-1000</td>
<td>0.000</td>
<td>Asymp.sig</td>
</tr>
<tr>
<td>43.56</td>
<td>27</td>
<td>3000</td>
<td>H₀ is denied</td>
<td>Result</td>
</tr>
</tbody>
</table>

**Hypothesis 4 test:**

Hypothesis: There is not a meaningful relationship between packaging physical shape and fruit and vegetable consumer’s behavior.

Hypothesis: There is a meaningful relationship between packaging physical shape and fruit and vegetable consumer’s behavior.

As we observed in hypothesis 1 analysis the data related to consumer’s purchase behavior don’t follow normal distribution in 95% certainty. (Kolmogorov-Smirnov test).

**Table: Hypothesis 4 test**

<table>
<thead>
<tr>
<th>Average of orders</th>
<th>N</th>
<th>Packaging physical shape</th>
<th>Purchase behavior</th>
<th>Kruskal-Wallis and Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>73.72</td>
<td>28</td>
<td>Square cube</td>
<td>17,237</td>
<td>Chi-square</td>
</tr>
<tr>
<td>69.53</td>
<td>102</td>
<td>Rectangular cube</td>
<td>3</td>
<td>Freedom degree</td>
</tr>
<tr>
<td>59.46</td>
<td>22</td>
<td>Cube</td>
<td>0.000</td>
<td>Asymp.sig</td>
</tr>
<tr>
<td>113.85</td>
<td>13</td>
<td>Cube with drawer</td>
<td>H₀ is denied</td>
<td>Result</td>
</tr>
</tbody>
</table>

**Conclusion:**

It is seen from obtained frequencies of table the size of packaging have had the most effects on consumer’s purchase behavior. The statistical results by using non parametric Kruskal-Wallis and Chi-Square show that there is a meaningful relationship between packaging dimensions and fruit and vegetable Purchasers Behavior in 95% certainty level.

As seen from obtained frequencies, the most purchase behavior is related to material statistical results show that freedom degree, 3 and alpha level 5% and Chi-Square (18.45) are more. By using Crocal Valis test, we can say that there is a meaningful relationship between packaging material and fruit and vegetable consumer’s behavior.

Statistical result by using non parametric Corscal Valis and Chi-Square show that there is a meaningful relationship between packaging weight and fruit and vegetable consumer’s behavior.

Statistical result by using non parametric Corscal Valis and Chi-Square show that there is a meaningful relationship between packaging shape and fruit and vegetable consumer’s behavior.
REFERENCES

[23] Technology and Development of Packaging Industry (www.persiapack.ir)