Competitiveness Measurement of Oranges Based on Consumer Preference

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Abstract: *In the era of free trade, the competition between fresh local oranges and fresh imported oranges will be intensified to compete for the high market share of fresh orange consumers in Indonesia. The purpose of this research is to analyze price competitiveness, attributes quality and factors that affecting consumer preferences of local orange and imported orange. Moreover, this research measure competitiveness between local orange and imported orange based on consumer preferences which is based on Hsu and Wann's research (2004) and Benjamin et al. (2004). This research design is descriptive which is conducted through questionnaire. The sampling technique used was convenience, from obtained 150 samples. There are three variables that taking role as main focus in this research, which are price level, attributes quality (taste, colour and size), and factors that affect (individual, intrinsic, social economy and education) as independent variables, and consumer preferences as a dependent variable. The data obtained are processed using descriptive, statistic analytical T test, S test and kruskal-wallis test for price competitiveness, conjoint analysis for attributes, and discriminant analysis for affecting factors. Descriptive analysis show that most of the obtained respondents are women between 31-40 years old, married, undergraduate, and work as official employee. Statistic analytical T test, S test and kruskal-wallis test show that the price of local orange are lower than any imported orange. Conjoint analysis show that the taste of local orange has the highest importance point, meanwhile imported orange' colour and size has the highest importance point. Discriminant analysis show that intrinsic factor are the most dominant influence preferences to orange. Intrinsic factors consist taste, skin colour, fruit size, fruit shape, freshness, fruit's water content, and fruit's smell.*

Keywords: competitiveness, preference, discriminant, conjoint

1. Introduction

Orange is one of the horticultural comodity that has special attractiveness to Indonesian people. Orange consumption rate rises every year, it reach 2.711 kg/capita or rise 11.65% every year [1]. The demand of orange is rising, but fluctuation is occured in local orange production especially in quarter I; the orange production is decreasing (Ditjenhorti 2016), so that the demand have to be covered by doing import. Since 2010 the volume of orange importion is rising because consumers prefeference change to imported orange. Imported orange demand rate production and its import volume can be seen in Table 1.

Table 1: Consumer needs, production of local orange and volume of imported orange in Indonesia

Years	Consumer Needs(tons)	Production of Local Oranges (tons)	Volume of Imported Oranges (tons)
2010	1 007 768	1 937 773	192 815
2011	855 360	1 721 880	217 865
2012	685 577	1 498 396	215 714
2013	563 344	1 548 401	96 560
2014	689 827	1 785 264	139 184
2015	703 934	1 744 339	238 269

Source: *UN Comtrade*, BPS, and Susenas Indonesia

National orange consumption demand rate need high and stable supply production for every year. This condition show that there are problems in local orange distribution and trading in Indonesia. The rising in imported orange volume is suspected happened because of instable local orange production [3] and there is a change in consumers preference from local orange to imported orange. Competition of local orange and import orange can be said that it happened because of price competition, attributes quality and any factors that affect the consumer preferency.

The purpose of this research are to analyze price competition, attributes quality and any factors that affect the consumer preferency to local and imported orange in Indonesia as form to measure competitive value between them. The orange we're talking about are ready consumed orange. The objects are siam and keprok type local orange and for the imported orange are mandarin, kino, tangerine and clemenville based on code HS 080520 *UN Comtrade*. This research is scoping fruits market segmentation in Indonesia which is divided into three segmentation based on market's capacity to fulfill consumer's subject segmentation point.

2. Literature Review

There are several references that related to the factors that influence local and imported orange competition. This research is an expand from research conducted by [4], [10], [15], [25], [9], and [20]. This research focused on competition value between local orange and imported orange based on price competition, attributes quality and factors that affect consumers preference. Agrobusiness products's multiattributes showed by fruit's price [4], visual quality of the fruit [4, 21], sensory appeal like taste [20], texture and fruit's smell and also freshness, firmness, size, colour and smell [7].

Price
Product's price become an important factor for market segmentation in decide of buying [3]. Consumers preference of local and imported fruits focused on which one is cheaper [25]. Consumers satisfaction of price can be affected by

price-quality ratio, price transparency, price reliability, and *relative price* [13].

Taste
The consumers have really good qualification to product's taste attribute [20]. Taste attribute on orange become an important consideration to the consumer. Taste characteristics on orange is an indicator of product's quality which determine the consumers' preference [10].

Colour
Fruits' colour has contribution in affecting the purchasing of fruits product [13,8]. Consumers preferency to colour attribute is a consumer awareness indicator to orange ripeness. [25]. Fruits' colour become one of the important factor in deciding purchase. Consumers preferency in orange consumption is based on attractiveness of the orange' peel [20, 25].

Size
Fruits size is an important point for the consumers [12]. Size is also a orange attribute that affect the purchase. This intrepeted by fruits amount in one kilograms [18].

Factors that affect the consumers preference
Based on [18], characteristic that affect food preferency divided into three groups, which are individual, food and environment. Factors that affect the food preferency [11] are individual factor, social economy, education, biological factor, physiology and psychology, extrinsic and intrinsic factor, culture, religion and regional factor. Factors that significantly affecting the consumers preference is individual factor, education and intrinsic factor and also social economy [17].

3. Methods

This research was conducted in May - June 2017. The research conducted in Jakarta which is divided into five districts. The districts are North Jakarta, West Jakarta, South Jakarta, East Jakarta, and Central Jakarta. The data collected is processed with descriptive method through interview with questionnaire to the consumers.

There were 200 respondents in this research, but only 150 valid respondents became samples. The respondents of this research are consumers who consume local orange and imported orange in the last 3 months. The research conducted in three-market-segmentation which are consist of traditional market, supermarket and specialized-fruit store. The sampling technique used is multistage non-probability sampling with purposive and convenience sampling approach. The data obtained were analysed using descriptive analysis, statistic analytical T test, S test, and kruskal wallis test to analyze price competitiveness, conjoint analysis to analyse quality attributes competitiveness, and discriminant analysis to analyze factors that affecting consumer preferences.

4. Result

The data obtained were processed using four analytical methods, which are descriptive analysis, statistical analysis, conjoint analysis and discriminant analysis. Descriptive analysis used to describe the profile of respondents, statistical analysis through SPSS application used to explain price competitiveness, conjoint analysis used to analysis quality attributes competitiveness, and discriminant analysis through SPSS application used to explain factors that affect consumer preferences among local orange and imported orange.

4.1 Descriptive Analysis

There are two aspects of preliminary information obtained from the respondents, which are the respondents' demographics and orange consumer stage. This research involved 150 respondents consisting of respondents who consume local orange and imported orange in the last three months and purchasing in three-market-segmentation.

For demography aspects, female respondents in this research are 66.00% and 34.00% male. Respondents age are within 31-40 years old (36.67%). Most of respondents education are bachelor degree (68.00%). The marital status of respondents 77.33% married and 22.67% of them are single. Most of the respondents work as official employee (56.63%).

4.2 Price Competitiveness Analysis

Price is a value that used by consumers to rate a product based on quality that provided by producer. Mendez *et al.* (2011) stated that price is significantly affects the consumer's preferency and rating to a product. T test analysis, S test analysis, and Kruskal Wallist test are used to see price level competition in the fruits market between local orange and imported orange in three market segmentation.

4.2.1 T Test result
In this research, T test is used to analyze price data of local orange and imported orange to each segmented consumer perception to see the price competition of each market segmentation and orange product.

Table 2: T test output of price

Market seg.	Local Orange		Imported Orange	
	Mean	T	Mean	T
S1	34 178	18.662**	24 288	32.146**
S2	26 572	19.755**	18 904	43.937**
S3	22 258	24.549**	21 938	37. 927**
**) Correlate significantly at 1%				

Based on the results of t test analysis in this study can be seen that in the local orange type of each market segmentation significantly different at the level of 1%, so it can be concluded that there is a price difference in each market segmentation. Rate level on each segmentation stratified from the average price at S1> average S2 price> average S3 price, this could be due to different market segmentation between one segmentation to another, the quality marketed in segmentation I and II is different from segmentation III, and

also difference in consumer needs from each market segmentation.

4.2.2 S Test result
This test is conducted to analyze price level difference from the each market segmentation between local orange and imported orange to see price competition between local orange and imported orange.

Table 3: S Test output of price

Market seg.	Frequency			Z
	Negative differences	Positive differences	Ties	
S1	10	40	0	-4.101**
S2	7	43	0	-4.950**
S3	29	21	0	-0.990
**) Correlate significantly at 1%				

Based on this research results, the significance value of each segmentation that compares the price level are 0.000 for segmentation I, 0.000 for segmentation II and 0.322 for segmentation III. The significance value less than the alpha value (0.005). This indicates that there are price differences on market segmentation I and II. In the segmentation I and II the price of local oranges in segmentation I mostly has a price greater than the price of imported oranges. This is different compared to segmentation III, local orange prices in Segmentation III have no significant difference in local orange and imported orange price, it means that both local orange and imported orange products have little competition with the percentage value of small price level.

4.2.3 Kruskal-Wallis Test result
Kruskal-Wallis test is conducted to analyze difference of market segmentation group rate level of local orange and imported orange and its effect to consumer decision in buying local orange or imported orange.

Table 4 : Kruskal-Wallis Test Output

Type of Orange	Mean Rank	Chi square
Local Orange		
S1	103.26	38.701**
S2	73.86	
S3	49.38	
Imported Orange		
S1	99.98	39.005**
S2	46.50	
S3	80.02	
**) Correlate significantly at 1%		

Based on the results of the analysis, the value of significancy in each segmentation that compares the price level are 0.000 for segmentation I, 0.000 for segmentation II and 0.000 for segmentation III. The sig value <0.05 indicates that there is a difference of price from the respondent assessment about perception of local orange price and imported orange in each market segmentation. The order of price level on local orange can be seen with Mean Rank value above, which are segmentation I (103.26), segmentation II (73.86) and segmentation III (49.38). Meanwhile the price level order of imported oranges are segmentation I (99.98), segmentation III (80.02), and segmentation II (46.50).

Based on the three analysis above, it can be concluded that in three market segmentation the local orange price level is higher than the price of imported orange. At the local level variables the local orange fare can't compete with imported orange. This corresponds with the research of [4, 25] which stated that consumers prefer imported oranges due to cheaper price levels.

4.3 Conjoint Analysis result

Comparison of attribute preferences between local orange and imported orange is obtained from consumer perceptions in determining the important attributes of local orange fruits and imported orange. From the comparison of importance values of taste, color and size attributes analyzed using conjoint analysis is obtained attributes that are considered important by consumers in orange fruits. Based on conjoint analysis, it was found that the value of consumer interest to the local orange fruit product in sequence, attribute taste as the most important value (46.61%), then the color attribute (34.92%) and attribute size (23.56%). The value of the consumers' interest on the imported orange fruit products was the attribute of taste (45.01%), the color attribute (40.03%), and the size attribute (24.36%). The value of interest is then used as a measurement of attribute quality competition between local orange and imported orange at the consumer level in Figure 2. Figure 2 shows that in terms of flavor, local orange is superior than imported orange, for the color attribute and size of imported orange is superior than local orange. This corresponds with [20] that consumers choose local orange fruits because of the sweeter taste and higher water content.

4.4 Discriminant Analysis

This research analyzed the factors that influence consumer preferences on the purchase of local orange and imported orange. Factors that influence the dominant food consumption include personal factors, intrinsic factors, socioeconomic factors and education factors [16].

4.4.1 Factors that affect local orange preference
Factors that affect the respondent's preference to local orange are personal factor, intrinsic factor, socioeconomic factor and educational factor. The grouping of respondents will be divided into two groups, which are group that like local orange and groups that do not like local orange.

Table 5: Discriminant test output of local orange

Factors	Wilks' lambda	F	df1	df2	Coeff.
Pribadi	0.963	5.679	1	148	-0.007**
Intrinsik	0.376	245.785	1	148	0.437**
Sosial ekonomi	0.640	80.520	1	148	0.314**
Pendidikan	0.970	4.528	1	148	-0.048**
(Constant)					-13.099
**) Correlate significantly at 1%					

The respondents grouping from discriminant analysis showed that the group that liked local orange was 29.33% while the local orange dislike group was 70.67%. Based on the results of discriminant analysis of factors affecting the preference of respondents to local orange with less than 0.05 sig value is a

personal factor, intrinsic factors, socioeconomic factors, and educational factors. All of these factors can be incorporated into the model or discriminant function. Thus, personal factors, intrinsic factors, socioeconomic factors and educational factors affect the respondents to the preference of imported orange. Based on the analysis it can be obtained discriminant function as follows:

D = -13.099 – 0.007 Personal + 0.437 Intrinsic + 0.314 Sosioeconomy - 0.048 Education

The influence level of the most distinguishing variables between each group in the discriminant model can be seen in the value of the discriminant equation function. Discriminant equation shows the value of each variables, which are the influence of each variable to the dependent variable. The highest coefficient in this discriminant function is intrinsic factor (-0.437), and then socioeconomy factor (0.314), personal factor (-0.007) and education factor (-0.048). The coefficient on the intrinsic factor is higher than the other factors, indicating that in the discriminant function, respondents' perception of the intrinsic factor or the influence is determined by local orange as a variable that greatly differs whether a respondent likes or dislikes local orange.

4.4.2 Factors that affect imported orange preference

Factors that affect the respondents' preference to imported orange is personal factor, intrinsic factor, socioeconomy factor and education factor. The respondents will be splitted into two groups, which are group of people that like orange and group of people that dislike orange.

Table 6: Discriminant output of imported orange

Factors	Wilks' Lambda	F	df1	df2	Coeff.
Faktor Pribadi	,924	12,242	1	148	,027**
Faktor Intrinsik	,532	130,418	1	148	,417**
Faktor Sosial Ekonomi	,980	2,989	1	148	,032**
Faktor Pendidikan	,960	6,180	1	148	-0.50
(Constant)					-10,081

**) Correlate significantly at 1%

The grouping of respondents from disrciminant analysis showed that group that like the imported orange is 58.67% and group that dislike the imported orange is 41.33%. Based on discriminant analysis, factors that influence the respondents' preference for imported orange with sig value less than 0.05 is personal factor, intrinsic factor, and sosioeconomy factor. Those three factors can be incorporated into the discriminant model or function. So, personal factor, intrinsic factor, and socioeconomy factor affect the respondent's preference to the imported orange. Based on this analysis it can be obtained discriminant function as follows:

D = -10.081 + 0.027 Personal + 0.417 Intrinsic + 0.032 Education

Discriminant equation above shows the value of coefficient of each variable, which means how much it affects on the dependent variable. The highest coefficient of the first

function are intrinsic factor (0.993) then personal factor (0.304) and education factor (0.216). In this research, intrinsic factor has the highest coefficient value. It means that the perception of respondents to intrinsic variables or factors in imported orange is a variable that greatly distinguishes whether a respondent likes or dislikes imported orange.

Based on discriminant analysis on factors influencing consumer preference between local orange and imported orange, it's found that orange's intrinsic factors are the main concern of the consumers in consuming oranges. Intrinsic factors that is found in orange are taste, colour, size shape, freshness, aroma, and the water content. Based on [16, 18], intrinsic factor is affecting the consumers preference in purchasing fruits the most. In accordance with [10], freshness and size become the main concern of consumers preference, while the taste and shape attributes of the fruits become the internal concern of consumers reference [4]. Colour attribute is important in consumers preference based on [12, 8], which stated that fruits' colour has contribution in influencing fruits purchase. Size attribute in intrinsic factor is a factor that based on consumer's preference according to [12], [20], [18], and [25]. Water content attribute and freshness, especially in local orange are more important for the consumers and also corresponds with [20], which stated that preference to local orange is higher because of higher water content and better freshness than imported orange.

5. Conclusion and Suggestion

5.1 Conslusion

The imported orange price level is significantly lower than the local orange. Local orange can't compete with imported orange in terms of price. Attribute of taste, colour and size are important factors in determining orange's quality. The highest important value of local orange is in the taste, meanwhile for the imported orange are the colour and size. Factors that affect the consumers' preference in consuming oranges whether it's local or imported is the intrinsic factor. Intrinsic factors are include taste, colour, size, shape, freshness, water content and fruit smell.

5.2 Suggestions

The suggested policy after the research, about the price competition between local orange and imported orange is addressed to the government as an intitution that formulating and compiling the commodity price policy. The government should adopt a strategy policy of competitive prices of local orange by improving the local orange distribution system and trade, orange import management policy strategy and improving the efficiency of national orange production system to improve the competitiveness and quality of local orange. For fresh businessman and farmers are expected to develop local orange products based on consumers demand by improving the cultivation system through certified seed and good post-harvest handling.

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