Consumer Preference Towards Fruit Leather Attributes of Madurese Exotic Tropical Fruits

Elys Fauziyah

Jurusan Agribisnis, Fakultas Pertanian, Universitas Trunojoyo Madura
Jl. Raya Telang, Kamal, Bangkalan, Madura 69162, Indonesia

ARTICLE INFO	ABSTRACT

Madura island has high potential for producing tropical fruits, but it still not being well managed especially concerning with the value added. Fruit leather is a product created by using various fruits and simple technology application. Fruit leather is categorized as new product on the market, therefore it is important to know consumer preference towards fruit leather attributes so that producer can design an acceptable product in the market. The research investigated attributes within the levels that become consumer preference in purchasing fruit leather product. There were 60 samples respondents taken accidentally at Bangkalan Plaza Shopping area. Method being used was conjoint analysis. Result showed that fruit leather being chosen by consumers as preference are gummy, mixed fruit taste, yellow color, small roll shape, at 100 grams and in a plastic tube package.

SARI PATI

Pulau Madura memiliki potensi yang cukup besar dalam menghasilkan buah-buahan tropika, namun belum terkelola dengan baik, terutama dalam hal pemanfaatan nilai tambahnya. Fruit leather merupakan produk yang diciptakan dengan memanfaatkan bahan baku aneka buah dengan teknologi pembuatan yang sederhana. Namun perlu diketahui preferensi konsumen terhadap atribut fruit leather supaya produsen dapat mendesain produk yang dapat diterima oleh pasar. Penelitian ini bertujuan untuk mengetahui atribut dan level atribut yang menjadi preferensi konsumen dalam pembelian fruit leather. Sample penelitian berjumlah 60 orang yang diambil secara accidental di kawasan perbelanjaan Bangkalan Plaza. Tujuan penelitian dianalisis dengan menggunakan metode konjoin. Hasil yang diperoleh menunjukkan bahwa atribut fruit leather yang dipilih konsumen adalah fruit leather yang bertekstur kenyal, memiliki rasa mixfriut, berwarna kuning, berbentuk rol pendek, ditaruh dalam kemasan 100 gram, dan dikemas dengan menggunakan tabung plastik.

Corresponding author:
fauziyah@trunojoyo.ac.id

INTRODUCTION

Indonesia that geographically located in tropical area is being known as mega-biodiversity country for having huge biological diversity, including high potential of exotic tropical fruit production such as avocado, banana, mango, starfruit, duku, durian, pineaple, cempedak, langsat, markisa, sapodilla, etc. According to Directorate General of Horticulture (2016), there have been an increase of tropical fruits harvesting area during 5 years (2010-2015) as much as 22.06 % and an increase of Indonesian tropical fruit production as much as 66.25 %. However, the increase has not corresponded with increase of fruit consumption in Indonesia that reached 12-15 % in average per year in the form of fresh and processing fruit (Krisnamurthi, 2016).

Madura island which is known as salt island actually have the potential of diverse exoctic tropical fruits production. As further description, Bangkalan Regency is known as bark producer with soft texture, crispy and sweet fruit. Bark production reaches 25,013.12 tonnes per year (BPS Bangkalan, 2015). Next, Saronggih Sub district of Sumenep Regency is known as custard apples producer by production reaches 75-100 fruits per tree for each harvesting moment. In addition, jackfruit, manggo, juwet (Madurese grape), sapodilla, cashew nuts can be seen at any area in Madura island. Potential of tropical fruits in Madura can be seen at following table 1. Farmer household at dry land like Madura has lower income level compared to those who live in productive area (Fauziyah et al. 2014). One of effort in order to increase is by enhancing economic potential using local base raw material. In this case, it may utilize exotic tropical fruit value added with Madurese special characteristic through processing into various products such as fruit leather.

Fruit leather is one of fruit processing product in the form of sheet with sweet taste, soft, gummy texture, water content ranged between 15 up to 25%, storage capacity up to 9 months, and being favorite of consumer in international market (FAO 2016). This product is judged as health supports, practical in consumption and give pleasure due to gummy texture, transparent and strong fruit taste (Diamante et al. 2014).

Fruits leather by using Madurese potential exotic fruit is categorized as new product and not much being known by consumer. In regarding with

Table 1. Production of Tropical Fruits at Bangkalan Regency in the Year 2014

No.	Fruits	Production (Tonne)
1	Avocado	329
2	Star fruit	484
3	Guava	19 005
4	Palm	406.47
5	Pineaple	2 178
6	Papaya	7 803
7	Manggo	54 005
8	Banana	103 346
9	Bark	34 001
10	Jackfruit	47 041
11	Orange	4 680
12	Big size Orange	6 750

Source : Bangkalan Dalam Angka (2016)

this, producer should find out the attributes of product that suppose to be consumer preference. Thus, success of marketing activity has been becoming necessity so that product industrial will be developed more into expected direction (Kotler, 2000). According to assauri (1992), product creation should pay attention on factors contained in the product namely quality, features, options, brand names, packaging, sizes, product lines, product items, warranties, services. Meanwhile based on Roesipah (2013), Mohebalion (2013) and Andriyani (2014), the attributes mostly being considered by consumer in purchasing food products are price, color, texture and packaging. Understanding consumer preference and their judgment about the products may help the company in determining strategy to increase customer satisfaction and loyalty to be further being used in reinforcing the position among competitors (Pullman, Moore, and Wardell 2002). The research aimed to analyze attributes within the levels on Madurese exotic tropical fruit leather to determine most preferred product by consumers.

Literature Review

Recently, business environment is close to tight competition and rapid change. Therefore, in order to achieve the objective, the company should conduct consumer behavior observation as well as consumer preferences. Consumer preference is defined as consumer's taste or choice towards the product being consumed. According to Dwiastutik (2012), consumer perception is resulted from consumer knowledge that gained from various informations about the product. These are 1) awareness on product category and brand, 2) product terminology, 3) product attributes or features such as class, shape, brand, model, benefit, and value that will be achieved by consuming the product, 4) trust on the general product category and specific brand.

Consumer perception towards the product quality can be affected by intrinsic or extrinsic attributes (Caswell et al. 2002). Food is as a product that

can be categorized as search product, experience product and credence product. It is resulted based on the attributes that can be found by consumer at various different stages. A thing can be categorized as search product when consumer can evaluate information of relevant product attributes before purchasing the product such as price, dimension, size, color. Meanwhile, things can be classified as experience product when the information of relevant attributes can be determined after consuming the product such as quality and taste. Things is categorized as credence product when the attributes is difficult to be determined by the consumers either before or after the consumption such as healthiness, free pesticide, organic product, certified product, etc. These attributes are usually determined by authorized institution (Moser et al, 2011).

The research is conducted to understand consumer preferences towards product attributes that have been done by various analysis methods. One of analysis tool oftentimes being used to identify consumer preferences is conjoint. Conjoint Analysis is multivariate technique that can be used to understand the choice taken by individuals. In specific, the technique is used to gain signals how the consumer judge various attributes based on their evaluation (Green dan Srinivasan, 1978). According to Reddy et al (1995) product characteristic is described as attributes. Variation of attributes is drawn as attributes level. Next, Ryan (1999) assumed that conjoint analysis enables product attributes to be considered simultaneously, and enable consumers to put options on the attributes. Relatives interest of each attribute is counted by using range utility (Green dan Krieger, 1996). Biggest attributes level value shows that the attribute level is most preferred by consumer, and conversely smallest value means that the level is un preferred by consumer (Myung, 2003).

Basic model of conjoint is estimated by using regression ordinary least square (OLS), with variabel dummy (Fox, 1997). Dependent variable is

preference rank meanwhile independent variables consist of dummy variable for each attributes level. Conjoint analysis model mathematically can be shown as follows (Haaijer, Kamakura, and Wedel 2000; Carroll and Green 1995;):

$$u(x) = \sum_{t=1}^{m} \sum_{j=1}^{ki} \alpha_{ij} X_{ij}$$

In which U(x) is level of attributes interest, α_{ij} is utility coefficient, X_{ij} is valued 1 if there is level j from attribute i, and valued 0 if others. There are stages to arrange conjoint analysis namely:

1. Identify attribute and attributes level
2. Design combination of attributes or stimulant
3. Determine method of data collection.
4. Determine analysis method
5. Data Analysis within interpretation.

Conjoint analysis has been widely used in various researches. It is used in marketing studies to evaluate consumer preference to the product, services or price (Kuzmanovic, 2010; Kuzmanovic 2012). The method has been applied in order to understand preference in various markets such as retail (Wilson 2006; Kuzmanovic 2011), transportation (Hensher 2001), education (Sohn, 2010), labor in the context of decision election, telecommunication (Popović et al., 2012; Nakamura, 2010; Head 2010), tourism (Triphati, 2010) and food industrial (Ozayan, 1998;; Munandar et al., 2012; Oyatoye, 2013; Cheng, 2014; Ashraf, 2015; Imami et al., 2016).

The research scheme of consumer preference towards Madurese exoctic tropical fruit leather attributes can be seen in figure 1.

METHODS

The research was held at Bangkalan Plaza. Location determination was by purpose based on consideration that fruit leather is included as expensive product and targeted on both middle and upper economic class that use to be found in surrounded area of supermarket.

Bangkalan regency has high Madurese tropical fruits that mostly sold in primary product

Lost of opportunity in gaining better income, the solution is by adding the value through fruit leather creation

New product category, therefore it needs research about preferred product attributes by consumer

Product attributes: Packaging, shape, net contents, color, taste, texture

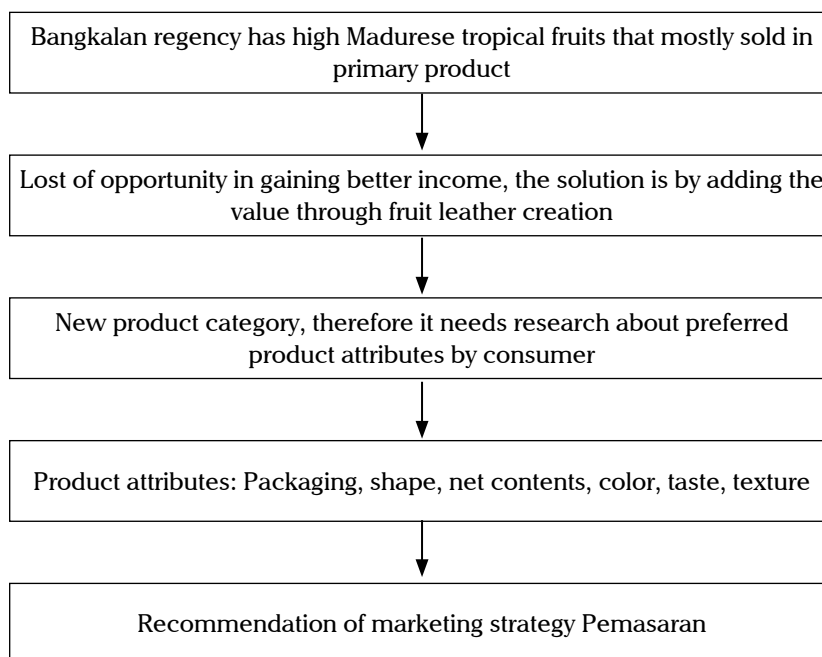Recommendation of marketing strategy Pemasaran

Figure 1. Research scheme of Consumer Preference towards Fruit Leather Attributes

Type of data being used in the research is primary data collected from interview process combined with questionnaire filled by respondents. The data to be gained is respondent's judgement towards stimulants (combination of several attributes level). Sample determination was by purposive using accidental sampling. There were 60 respondents taken as samples.

Research purpose was analyzed by using following conjoint method stages:

a. *Determining attributes and attributes level*
Attributes and attributes level in the research can be seen in table 2.

b. *Determining stimulant*
There are 18 stimulants served in table 3

C. *Respondents judged 18 stimulants by using Lickert scale on the following criteria*
1. : showing very non preferred stimulants
2. : showing non preferred stimulants

3. : showing preferred stimulants
4. : showing very preferred stimulants

d. *Analyzing data by using conjoint model through SPSS 16 software.*
Testing of result precision in conjoint analysis can be done by seeing Kendall's value correlation or between conjoint analysis result and actual respondent's opinion (using qualitative scale namely nominal and ordinal). High correlation result reflects the results of conjoint analysis that can describe real expectation.

RESULTS AND DISCUSSION

Process of decision making in purchasing of product is affected by various factors, including attributes attached on the product. Product attributes oftentimes considered to be identically with the characteristic attached on the product such as packaging, shape, net contents (weight of product in each package), color, taste and texture. According to several researches, attributes in

Table 2. Attributes and Attributes level to Judge Madurese Exoctic Tropical Fruit Leather Product

Attributes	Attributes level
Packaging	1. Small glass tube 2. Aluvo baskets 3. Plastic tube + wrap
Product shape	1. Sheet 2. Long roll 3. Short Roll / candy
Net contents	1. 50 gr 2. 75 gr 3. 1 ounce / 100 gr
Color	1. Red 2. Yellow 3. Brown
Taste	1. Original 2. Mixed fruit
Texture	1. Gummy 2. Soft 3. Hard

Source : Primary Data Processed, 2017

Table 3. Combination of Fruit Leather Product Attributes (Stimulants)

No	Packaging	Shape	Net	Color	Taste	Texture
1	Aluvo baskets	Long Roll	50	Yellow	Mixed Fruit	Hard
2	Aluvo baskets	Sheet	75	Brown	Original	Soft
3	Aluvo baskets	Sheet	100	Brown	Mixed Fruit	Gummy
4	Aluvo baskets	Short Roll	50	Red	Original	Soft
5	Aluvo baskets	Long Roll	75	Yellow	Original	Gummy
6	Aluvo baskets	Short Roll	100	Red	Original	Hard
7	Glass Tube	Short Roll	100	Yellow	Mixed Fruit	Soft
8	Glass Tube	Long Roll	50	Brown	Original	Soft
9	Glass Tube	Sheet	75	Red	Mixed fruit	Hard
10	Glass Tube	Long Roll	100	Brown	Original	Hard
11	Glass Tube	Sheet	50	Red	Original	Gummy
12	Glass Tube	Short Roll	75	Yellow	Original	Gummy
13	Plastic tube	Sheet	50	Yellow	Original	Hard
14	Plastic tube	Sheet	100	Yellow	Original	Soft
15	Plastic tube	Short Roll	75	Brown	Original	Hard
16	Plastic tube	Long Roll	100	Brown	Original	Gummy
17	Plastic tube	Short Roll	50	Red	Mixed fruit	Gummy
18	Plastic tube	Long Roll	75	Yellow	Mixed fruit	Soft

Source : Primary Data Processed, 2017

the product will affect consumer preference in selecting product. Result of consumer preference analysis to the fruit leather product of Madurese exotic tropical fruits is shown in table 4.

1. Packaging attribute

Based on Kotler and Amstrong (2012), packaging has function as product cover to maintain the quality. Meanwhile, Wijayanti (2012) says that packaging has several functions such as product cover during distribution process, beautify the product, and also can be used as information media concerning with the product. Fruit leather that produced in Madura is packed by using 3 packaging materials, namely; small glass tube, aluvo basket and plastic tube. Each packaging material has an advantage and weaknesses. Small glass tube gives more exclusive impression, but it takes high price and fragile during distribution process. Aluvo basket packaging is made of siwalan tree woven that has an exotic shape but perishable. Meanwhile, plastic tube is long

lasting material and not easily broken. The price is relatively cheap as well. Based on the analysis, consumers put preference on fruit leather packed by plastic tube. This packaging adds higher utility to the consumer compared to two other packaging materials. This condition describes that producer suppose to choose plastic tube as packaging material. Nevertheless, product that packed by using both aluvo basket or glass tube is still being interested by consumers. This can be seen at the positive sign of utility estimation value although it is not as much as utility value of plastic tube. The result is similar to the research of Kalsum et al. (2013), on Rengginang product in Madura.

2. Product Shape Attribute

Fruit leather is type of food made from juicing pulp and then dried. It is not truly made from rind, but juicing pulp of tropical fruits that next being processed into slight sheet and an elastic texture. Fruit leather products generally have paper shape. But actually the product can be modified into

Table 4. Result of Conjoint Analysis of Consumer Preference Towards Madurese Exoctic Tropical Fruit Leather Product

Attributes	Attributes Level	Utility Estimate	Importance Value
Packaging	Small Glass Tube	.045	14.101
	Aluvo basket	.090	
	Plastic tube	.136	
Shape	Sheet	-.006	15.595
	Long Roll	-.011	
	Short Roll	.017	
Net contents	50 gr	.085	14.742
	75 gr	.169	
	100 gr	.254	
Color	Red	-.137	19.743
	Brown	.274	
	Yellow	.411	
Taste	Original	.138	15.938
	Mixed Fruit	.277	
Texture	Hard	-.136	19.882
	Soft	.271	
	Gummy	.407	
(Constant)		3.723	

Correlation Pearson's R and Kendall's   Sig 0.024

other shape such as long roll, short roll or other as preference. There are three shapes of fruit leather namely sheets, long roll and short roll. Analysis result has shown that consumer prefer fruit leather attributes in a short roll shape. According to consumer opinion, this shape increased their satisfaction meanwhile two others are not being chosen as preference. Short roll of fruit leather has an advantage in practical of consumption. Consumer can enjoy the product like candy. Based on the research, there is drawing of 45 peoples or about 75% respondents choosing short roll fruit leather.

3. Net Contents/Weight of Packaging Attributes

Net contents or weight of packaging is one of most considerable attributes in purchasing product by consumer. Similar attributes were considered in the research of Mulyadi (2014). Generally, preference level of consumer about the net

contents is based on financial capacity, practical in carrying the product and estimation of consuming sufficiency. Fruit leather is categorized as snack. Consumer needs in product consumption usually only takes small portion and enjoy it during break moment of lunch or dinner. Based on this, attribute level included in the research were 50, 75, and 100 grams. The result had shown that most of consumer prefers fruit leather by 100 grams package. As the matter of fact, there were 52 respondents choose to buy fruit leather by 100 grams package.

4. Color Attribute

Next attribute oftentimes to be consideration in purchasing product is color. Rahayu (2012) also put color as one of attributes in the research of consumer preference towards imported apple product. There are red, yellow and brown used as color attributes in this research. It is based on
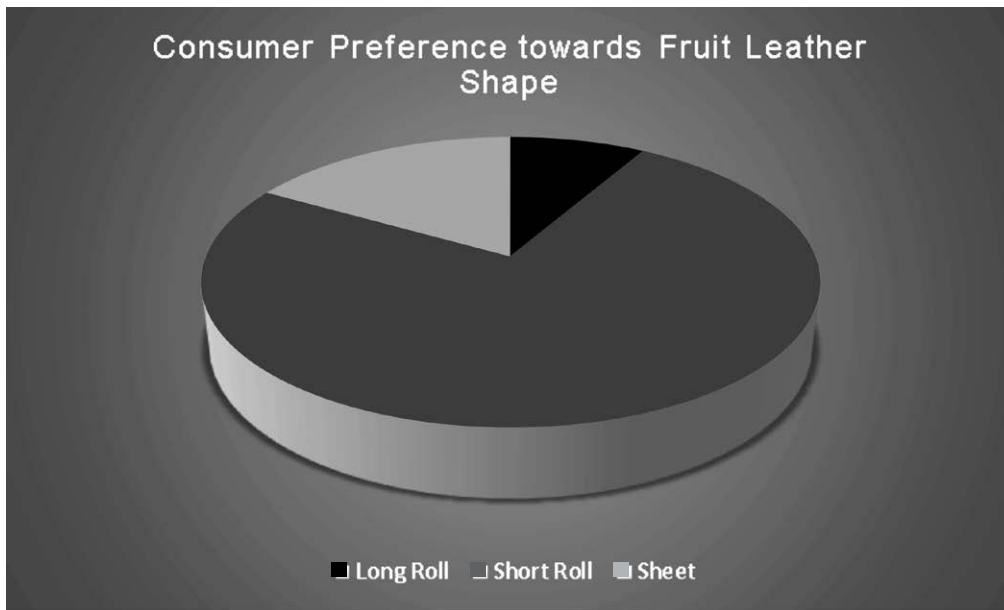
Figure 2. Level of Consumer Preference Towards Fruits leather Product
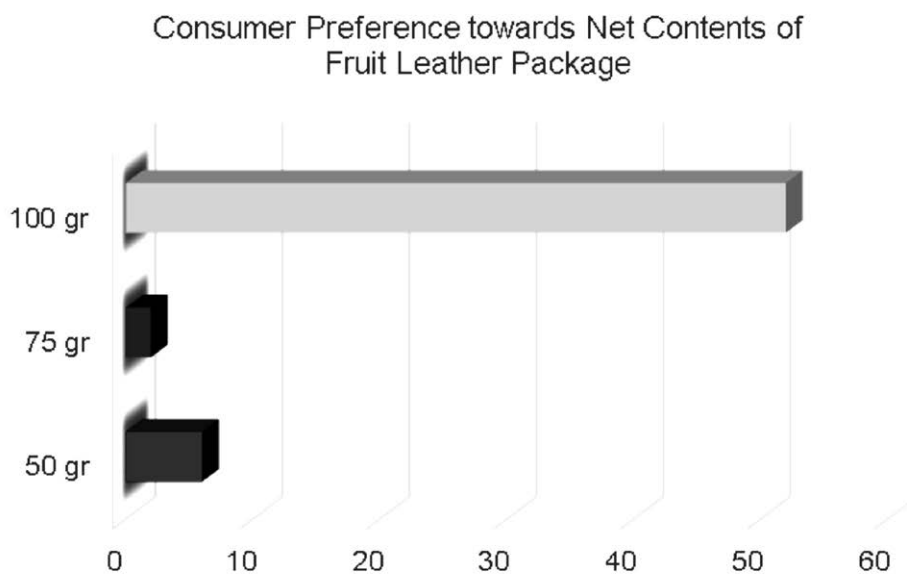

Figure 3. Consumer Preference Level towards Net Contents of Fruit Leather

color of tropical fruits in Madura that dominated by those three colors.

Research analysis result had drawn that yellow fruit leather is most preferable by consumers, besides brown color. Red color is not taken as an option of preference by consumers. Spread of consumer preference level for color data is shown in above diagram. Implication of the research can be used by producer in selecting yellow local fruits and brown as well to be used as material of fruit leather. Field identification in Bangkalan Regency had shown that there are huge productions of yellow fruits such as mangoes and jackfruit (Table
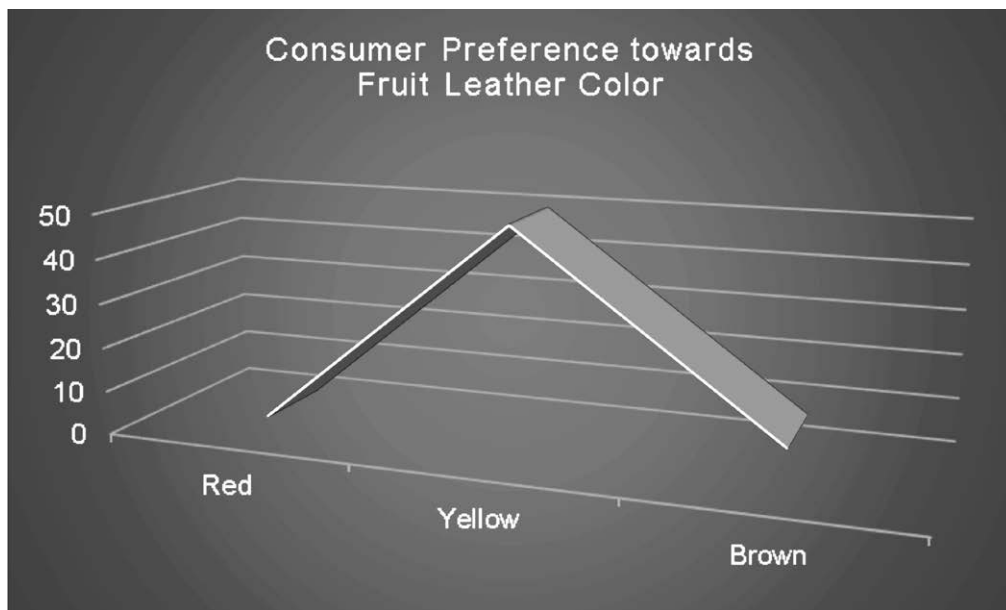
Figure 4. Consumer Preference Level towards Fruit Leather Color

1), therefore an opportunity to fulfill consumer preference towards color attributes is highly possible to be done.

5. Taste Attribute

Generally, taste attribute is being prioritized in producing food product. Fruit leather brings out taste as the material being used. Sweet, sour or mixed of both tastes inside the fruit that being used to determine fruit leather taste. This can be made by mixing various materials to bring out sensation of kind taste. The research served an original and mixed fruit taste. Result of analysis showed that mixed fruit is preferred to be taken by consumers and increase their utilities. Original taste had also increase their utilities although not as much as the mixed fruit. This is shown by field fact that there were 87 % consumers chose mixed fruit product. Based on this, producer may consider to produces fruits combination as fruit leather material.

6. Texture Attribute

Texture attribute in consumer preference towards food product had also conducted by Rosipah (2013). Fruit leather product has various textures namely hard, soft and gummy.

Material composition and pectin inside the fruits affects texture of fruit leather. According to Valenzuela and Aguilera (2015), fruit leather has sticky characteristic. This is caused by material, humidity, compression, and fineness. Research result had shown that consumer prefers gummy texture better than hard texture. This is supported by data spread of respondents in regarding with texture attributes, shown in Figure 5.

MANAGERIAL IMPLICATIONS

Based on several attributes within the levels judged by consumers, there are three most considered attributes in making decision to purchase fruit leather in respectively texture, color and taste. Meanwhile combination of attributes level chosen by consumer are gummy, mixed fruit, yellow, 100 grams and plastic tube package. This can be used as consideration of producer in designing the product.

CONCLUSION

Fruit leather attributes to be taken as preference by consumer in purchasing decisions in respectively are texture, color, shape, net contents, and package. Meanwhile attributes level of fruit
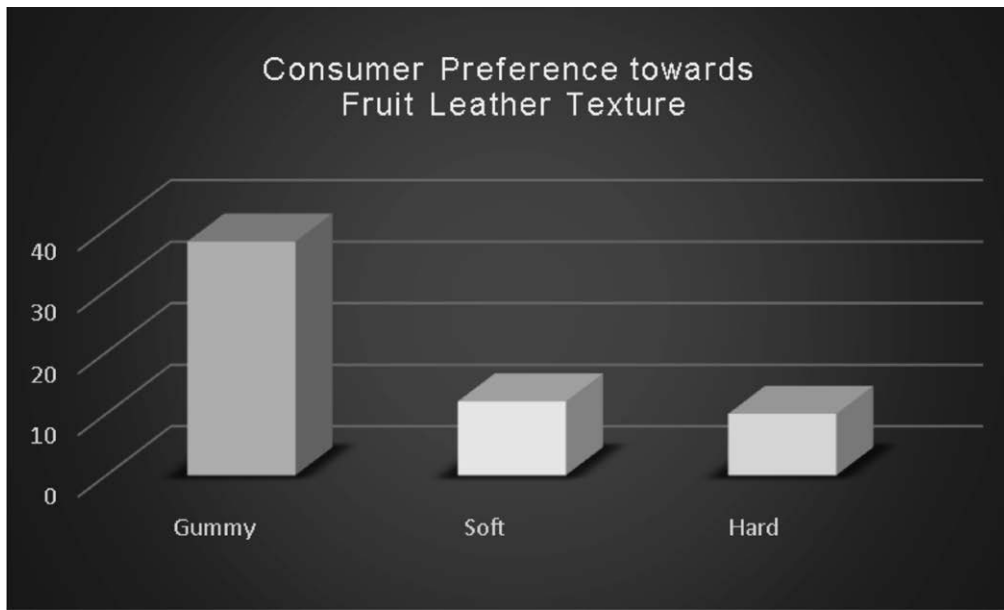
Figure 5. Consumer Preference Level towards Fruit Leather Texture

leather to increase utilities are gummy, yellow color, mixed fruit taste, short roll, 100 grams and plastic tube package. ■

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