

PRODUCT DEVELOPMENT SEASONING OF MADURA SATAY

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Article History: Received on 6th February 2019, Revised on 28th March 2019, Published on 10th April 2019

Abstract

Purpose of Study: Madura is one area in East Java province which has a wide range of local advantages such as Madura satay, Madura herbal, salt, corn, handicraft sickles, and others. Madura Satay is one of the advantages of a locally owned Madura island which is well known by the people of Indonesia and even to foreign countries. The seasoning of Madura satay is manufactured directly by the original Maduran people, so that consumers difficult to find its specific spices in the market. Therefore, there is a need for research on the development of the seasoning products of Madura satay instant.

Methodology: The method used in this research is the method of Quality Function Deployment.

Result: Based on the results of data analysis and processing, it can be concluded that there are eight consumer needs instant seasoning products of Madura satay, namely; product texture should be soft, there are a rancid taste, taste sweet spicy seasoning, spice brown-golden color, weight 500 grams of product, packaging using clear plastic material, the packaging must be attractive, low prices.

Implications/Applications: The level of customer satisfaction, there are two attributes of customer satisfaction that still need to be improved, namely the product weight of 500 grams and packaging using clear plastic material.

Keywords: *Madura, Product Development, Quality Function Deployment, Satay*

INTRODUCTION

Madura is one area in East Java province which has a wide range of local advantages such as Madura satay, Madura herbs, salt, corn, handicraft sickles, and others. Maduras name itself is popular due to its local food namely Sate Madura or Madura Satay which makes the name itself well known by the people of Indonesia and even to some foreign countries. Madura satay can be found in almost all regions of Indonesia especially in big cities like Jakarta, Bandung, and Surabaya. Madura satay usually made of chicken, but besides the chicken satay as the main ingredient, there is Madura satay with beef and also lamb. Marinade is a final ground mixture of peanut paste and an onion.

Satay is very easy to be made, because the meat only needs to be grilled by using charcoal and pierced it with bamboo skewers and smears the meat with soy sauce. Satay ripe will taste delicious when it mixed with seasoning that consists of peanut sauce and also lontong or rice.

EXPERIMENTAL DETAILS

The products were analyzed in this study is the Madura satay. The data required in the study include primary data and secondary data. The primary data obtained from interviews and questionnaires to respondents. Secondary data were obtained from literature searches regarding Quality Function Deployment (QFD) method and the results of previous studies by [Costa et al. \(2000\)](#). The new product can be assembled product, service, or software QFD that can also be applied to the development of food products ([Benner et al., 2011](#)). Data was collected through interviews, questionnaires, and literature study. The data contains the steps in the application of QFD method according to [Cohen \(1995\)](#). Data analysis aims to look at the attributes of consumer whether the quality needs to be improved or maintained ([Borisova and Parnikova, 2016](#); [Husein, 2000](#)).

RESULTS AND DISCUSSION

Satay is a traditional Indonesian food which usually made of chicken or beef served with a variety of spices depending on the variation satay recipe. Satay then burned on hot coals until cooked while inverted - turning and spread with a little cooking oil or coconut milk. Satay known from Java, and can be found in any area in Indonesia and has been considered as one of the national dishes of Indonesia. Indonesia is a country of origin of the satay, and this dish is known widely in

almost all regions in Indonesia and is regarded as the national cuisine and one of Indonesia's best dishes. Satay is a very popular dish in Indonesia and combines with so many traditions and cultures, it produces plenty types of Satay such as in one of the states in Indonesia named Ponorogo, there is Ponorogo Satay. Recipes and how to manufacture it depends on the region itself. Almost any kind of meat can be made as satay. As an origin of Satay, Indonesia has a rich variety type of satay recipes. Usually it will be served together with satay sauce, which the sauce can be a seasoning sauce, peanut sauce, or the other, usually accompanied by slices of red onion and cucumber, and cayenne pepper. Eat with warm rice, rice cakes, or diamond rice. Its variations are usually named based on the place of origin of the satay recipe, meat type, material, or process of manufacture. Some types of satay typical of the region in Indonesia, Madura satay, Padang satay, Ponorogo satay, and bunny satay.

The seasoning of Madura satay instant is a product development created to facilitate the general public in order to be easy to enjoy at an affordable price and available in various regions. Madura satay instant seasoning made from peanuts, garlic, onion, nutmeg, salt and soy sauce, which is then processed into a paste and packaged.

The initial step in the development of Madura product instant seasoning satay is identifying consumers needs. This stage is to identify the consumer needs of the types of products that have been determined to find out how the needs and desires of consumers with a variable interest rate to design products that will be developed (Suleri and Cavagnaro, 2016; Ulrich and Eppinger, 2011; Yazdekhasti et al., 2015). The data used in identifying the needs of these consumers are provided through direct interview to thirty respondents. There are eight attributes of consumer needs, as follows in the Table 1:

Table 1: Attribute consumer needs seasoning products Madura satay instant

Attribute Consumer Needs	
Product	The texture of the product should be soft
	There is a rancid taste
	Taste spicy sweet
	Clor condiment brown-golden
	Product weight 500 grams
Packaging	Packaging using plastic materials clear
	Packaging draw
	Low cost

Level of Consumer Interests

Level of consumer's analysis was conducted to determine consumers' interests of each attribute of consumer needs that have accumulated (Walpole et al., 2016) so that it can be traced for which part is the most important aspect for the consumers (Bernasconi and Rodriguez-Ponce, 2018; Keinonen and Takala, 2006). Data rate of consumers' interests obtained from questionnaires of 100 respondents, with 8 attributes assessed will be based on five levels, namely the interests ranging from very unimportant (value 1) to very important (score of 5). From there, the rating for each of the attribution can be seen and the producer might be able to notice which part that the consumers care the most.

Based on the above data it can be seen that the highest rating in terms of product is not about the rancid taste as it only shows with 1 rating, compared to the packaging itself shows with an 8 rating, and followed with the products weight, where it clearly refer to the manufacturer of product.

Validity Test

Validity test is done by using correlation technique product moment (Husein, 2000). If the $r > r_{xy}$ is considered as valid, whereas if the $r_{xy} < r$ then it is considered as not valid. Figures criticism on the correlation table value r with a significance level of 5% and the number of respondents a hundred people was 0.197.

Based on the results of the above calculation is said to be valid if the product moment (r_{xy}) greater of r table (0.197).

Reliability Test

Reliability tests performed using formula Cronbach's Alpha. If $r_{\alpha} > r$ then the questionnaire is reliable, whereas if $r_{\alpha} < r$ then the questionnaire is not reliable. Figures criticism on value $-r$ correlation table with a significance level of 5% and

Table 2: The level of consumer interests as instant seasoning products Madura satay

Attribute Consumer Needs	Σ	Level Of Consumer Interests	Rating	
Product	The texture of the product should be soft	389	3.89	6
	There is a rancid taste	453	4.53	1
	Taste spicy sweet	395	3.95	5
	Color condiment brown-golden	418	4.18	3
Packaging	Product weight 500 grams	343	3.43	7
	Packaging using plastic materials clear	373	3.73	8
	Packaging draw	440	4,40	2
	Low cost	418	4.18	4

Table 3: Test the validity of the attributes consumers needs seasoning of madura satay instant

Attribute Consumer Needs	rx	results	
Product	The texture of the product should be soft	0.453	Valid
	There is a rancid taste	0.649	Valid
	Taste spicy sweet	0.563	Valid
	Color condiment brown-golden	0.542	Valid
Packaging	Product weight 500 grams	0.605	Valid
	Packaging using plastic materials clear	0.598	Valid
	Packaging draw	0.648	Valid
	Low cost	0.572	Valid

the number of respondents was 0,197 hundred people. From calculations that have been done, the value of $r\alpha$ of 0.726. Therefore, it can be said that the questionnaire was reliable because of $r\alpha > 0.197$.

Table 4: Test Thereliability attributes of consumer needs instant seasoning Madurasatay

Attribute Consumer Needs	$r\alpha$	reliability	
Product	The texture of the product should be soft	0.726	reliabel
	There is a rancid taste	0.711	reliabel
	Taste spicy sweet	0.714	reliabel
	Color condiment brown-golden	0.718	reliabel
Packaging	Product weight 500 grams	0.707	reliabel
	Packaging using plastic materials clear	0.709	reliabel
	Packaging draw	0.709	reliabel
	Low cost	0.712	reliabel

Analysis Of Customers Satisfaction

Analysis of consumers satisfaction conducted to determine how satisfied are they toward the product (Goetsch and Davis, 2000). Data on the level of customer satisfaction with products such as Madura satay instant seasoning is obtained from the results of interviews from 30 respondents. Here is an example calculation level of customer satisfaction with the given product by using the formula:

$$CLS = \frac{\sum x}{N}$$

The higher the value of the scene in the attribute of the needs of consumers, the higher the level of customers satisfaction in the attribute of the needs of consumers. Here is the result of the calculation of the consumer satisfaction level for each attribute using consumer needs (Benner et al., 2003; Zare and Rajaeepur, 2013) of Madura satay instant seasoning products:

Table 5: The level of customer satisfaction instant seasoning products Madura satay

Attributes Customer Satisfaction	Σ	Level Of Customer Satisfaction	Rating
Product	The texture of the product should be soft	4, 13	3
	There is a rancid taste	4.26	1
	Taste spicy sweet	4.2	2
	Color condiment brown-golden	4	6
Packaging	Product weight 500 grams	3.73	8
	Packaging using plastic materials clear	3.96	7
	Packaging draw	4.1	5
	Low cost	4.1	4

Comparative Rate Analysis with Competitor Products

This analysis is used for comparing the product with other competitors. By using this method, the position of the product and competitors can be counted. This analysis was conducted by an interview with 30 respondents to determine the level of comparison between Madura Satay instant seasoning and competitor product, which is Pecel instant seasoning. Here is the level of comparison between Madura satay instant seasoning and Pecel instant.

Table 6: Level of spice instant seasoning with instant pecel

Consumer Satisfaction Attribute	Instant satay seasoning	Instant pecel seasoning
Product	The texture of the product should be soft	3.67
	There is a rancid taste	4.17
	Taste spicy sweet	3.73
	Color condiment brown-golden	3.77
Packaging	Product weight 500 grams	3.83
	Packaging using plastic materials clear	3.73
	Packaging draw	4.03
	Low cost	3.8

Based on the comparison that has been done, it can be seen that the Madura Satay instant seasoning is superior to Pecel instant seasoning except for the packaging, which is interesting and rancid taste has a very low difference.

Target (Goal)

Target to be achieved from this research is to know the product's interest by consumers, along with the attributes and important technical requirements that must be considered for the product in the form of Madura satay instant seasoning to meet what the customers expect. The target value is obtained by using the highest value of the comparison between the level of consumer's interest and the level of customer's satisfaction for each attribute of consumer needs. The following is the target value for each attribute of the consumer needs of the Madura satay instant seasoning.

Table 7: Targetvalue attribute of consumer needs for instant spice products

Consumer Satisfaction Attribute		Target Value
Product	The texture of the product should be soft	4.13
	There is a rancid taste	4.53
	Taste spicy sweet	4.2
	Color condiment brown-golden	4.18
Packaging	Product weight 500 grams	3.73
	Packaging using plastic materials clear	3.96
	Packaging draw	4.40
	Low cost	4.18

Calculation of Improvement Ration (IR)

The calculation of improvement ratio is evaluated against each attribute of consumer needs, so it can be known at which attribute that needs to be repair or improve its quality. The following is the calculation of the value of improvement ratio (IR) by using the formula:

$$IR = \frac{Target}{CLS}$$

If the value of $IR > 1$, it is necessary to make improvements or quality improvement for the attribute. The following is the value of the improvement ratio (IR) for each attribute of consumer needs of the Madura satay instant seasoning.

Table 8: Ratios of attribute improvement of consumer needs for Madura satayinstant seasoning

Consumer Satisfaction Attributes		Target Value
Product	The texture of the product should be soft	1
	There is a rancid taste	1,06
	Taste spicy sweet	1
	Color condiment brown-golden	1,05
Packaging	Product weight 500 grams	1
	Packaging using plastic materials clear	1
	Packaging draw	1,07
	Low cost	1,02

Determination of sales points done to find out how the role of each attribute of consumer needs to the sale of Madura satay instant seasoning. The point of sale is done by interviewing 30 respondents. The result of the interview is then calculated an average for each attribute of consumer needs. The higher point value of sales of an attribute of consumer needs, the higher the role of attribute of consumer needs to the Madura satay instant seasoning.

Based on the calculations that have been done can be seen that the point of sale that has the most important role is the attribute of the consumer needs a smooth texture and there is no rancid taste on instant spice products Madura.

Making Correlation Matrix

Making correlation matrix aims to know the relationship between technical requirements and attribute of consumer needs of instant spice products. The value of the relationship on HOQ was obtained from interviews and discussions with resource

persons. There are two correlation matrices for each of the Madura satay instant ingredients, a correlation matrix containing the relationship between the technical requirements and the attribute of the consumer needs in terms of the product, while another matrix contains the relationship between the technical requirements and the attribute of the consumer needs in terms of packaging.

Here is the correlation matrix for instant spice products obtained from interviews and discussions.

Table 9: Correlation Matrix of Instant Satay Spice Products in Product

	materialroasted for- mu- la- tions	beans of beans	quality of beans	addition of brown sugar	add a little petis	smoothing way	addition of soy sau	long cook- ing time	production equip- ment is closely moni- tored	production temper- ature
The texture of the product should be soft	9		1	9		9		3		9
there is no rancid taste (typical aroma of satay seasoning)		9	9		3				9	
taste spicy-sweet flavour	3						9			
blackish brown seasoning (not burnt)			1		1		9	9	1	9

Table 10: Correlation Matrix of Satay Instant Flavor Products from the Facet of Packaging

	packaging using vacuum sealer	storage temperature	type of PP plastic packaging or aluminum foil
netto 250 grams		3	
packaging using clear plastic materials	9	9	3
attractive packaging	3		9
price IDR 5.000			3

The priority value of the technical requirements indicates how important a technical requirement to develop. The higher the priority value of a technical requirement, the higher the priority of technical requirements to be developed, because the technical requirements have a great influence in meeting the needs of consumers of the products developed in this case.

Calculation of priority value and contribution from faithful of technical requirement in order from highest to lowest. The priority value of technical requirement get from relation value of correlation matrix and normalized raw weight value calculation of priority value with a formula:

$$\text{Priority} = \sum (\text{value of relationship} \times \text{normalized raw weight})$$

After obtaining the priority value of each subsequent technical requirement in doing the calculation of the contribution value is the percentage of the priority value of a technical requirement of the total value priority technical requirements. Calculation of contribution value using the following formula:

$$\text{Contribution} = \frac{\text{Value of Relationship}}{\sum \text{Value of Relationship}}$$

CONCLUSION

Based on the results of data analysis and processing, it can be concluded that there are eight consumer needs instant seasoning products Madura satay, namely; product texture should be soft, there are a rancid taste, taste sweet spicy seasoning, spice brown-golden color, weight 500 grams of product, packaging using clear plastic material, the packaging must be attractive, low prices. While the level of customer satisfaction, there are two attributes that still need to be improved, namely 500 grams of product weight and packaging using the clear plastic material.

There are 13 technical requirements to answer the 8 attributes of the consumer needs of Madura satay instant seasoning, namely the formulation of ingredients, roasted peanuts, bean quality, the addition of brown sugar, smoothing method, soy sauce addition, heating time, strictly controlled production equipment, production temperature, petis, packaging using vacuum sealer, storage temperature and type of pp plastic packaging or aluminum foil. Technical requirements that should be a top priority in the production process of Madura satay instant seasoning is the temperature of production while in terms of packaging technical requirements that must be prioritized is the type of pp plastic or aluminum foil used.

REFERENCES

- Benner, M., Dekker, M., and Linnemann, A. R. (2011). Structured Food Product Development Based on Quality Function Deployment. In Linnemann, A. R., Boekel, M. V., and Schroen, C. G. P. H., editors, *Food Product Design. An Integrated Approach 2nd Edition*, pages 53–66, Wageningen. Wageningen Academic Publishers.
- Benner, M., Linnemann, A. R., Jongen, W. M. F., and Folstar, P. (2003). Quality Function Deployment (QFD) Can It be Used to Develop Food Products? *Food Quality and Preference*, 14:327–339.
- Bernasconi, A. and Rodriguez-Ponce, E. (2018). Importancia de la gestin institucional en los procesos de acreditacin universitaria en Chile. *Opcin*, 34(86):20–48.
- Borisova, U. S. and Parnikova, G. M. (2016). Methodological Approaches and Pedagogical Conditions of the Educational Autonomy Formation in Students-Natives of Yakutia. *International Electronic Journal of Mathematics Education*, 11(10):3397–3403.
- Cohen, L. (1995). *Quality Function Deployment: How to Make QFD Work for You*. New Jersey. Prentice Hall.
- Costa, A. I. A., Dekker, M., and Jongen, W. M. F. (2000). Quality Function Deployment in the Food Industry: A Review. *Trends in Food Science & Technology*, 11(9-10):306–314. 10.1016/S0924-2244(01)00002-4.
- Goetsch, D. L. and Davis, S. B. (2000). *Quality management: Introduction to total quality management for production, processing, and services*. New Jersey. Prentice Hall.
- Husein, U. (2000). *Metodologi Penelitian Aplikasi dalam Pemasaran [Application Research Methodology in Marketing]*. Jakarta. PT. Gramedia Pustaka Utama.
- Keinonen, T. K. and Takala, R. (2006). *Product Concept Design: A Review of The Conceptual Design of Products in Industry*. London. Springer-Verlag London.
- Suleri, J. and Cavagnaro, E. (2016). Promoting Pro-environmental Printing Behavior: The Role of ICT Barriers and Sustainable Values. *Dutch Journal of Finance and Management*, 1(1):38. <https://doi.org/10.20897/lectito.201638>.
- Ulrich, K. T. and Eppinger, S. D. (2011). *Product Design and Development 5th Edition*. London. McGraw Hill Education.
- Walpole, R. E., Myers, R. H., Myers, S. L., and Ye, K. E. (2016). *Probability and Statistics for Engineers and Scientists 9th Edition*. London. Pearson.
- Yazdekhesti, A., Erfan, N., and Nazari, N. (2015). Investigating the Relationship between Spiritual Intelligence and Social Adaptation among Girl High School Students in Shahreza City. *UCT Journal of Social Sciences and Humanities Research*.
- Zare, H. and Rajaepur, S. (2013). THE TASKS OF SOCIAL WORKERS WORKING WITH CHILDREN OF DIVORCE: A REVIEW. *UCT Journal of Management and Accounting Studies*, 1(1):5–10.