

Discourse Network Analysis (DNA) on Preference Consumers on Food Products Made From Modified Cassava Flour (MOCAF)

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Abstract: - The purpose of this research is to see consumer preferences for food products made from MOCAF by using Discourse Network Analysis (DNA). Using DNA analysis, issues and concepts of issues can be obtained which can be used as indicators and variables that determine consumer preferences for food products made from MOCAF raw materials. The analysis used in this research is DNA analysis. Sources of DNA data come from various information in cyberspace in accordance with the research context. DNA data processing will produce statements, actors, concepts/issues, and sentiments, along with the origin of the organization that can be used as variables and the relationship between existing variables can be known. The findings of this study are obtained variables that can be used to determine consumer preferences for food products made from MOCAF that is product quality, product service quality, Indonesian import quantity, consumer satisfaction and marketing strategy. Originality in this study is the use of DNA analysis in determining the variables used in viewing consumer preferences for food products made from MOCAF. There is no previous research that discusses consumer preferences for food products made from MOCAF by using DNA analysis in determining the variables used.

Key-Words: - Discourse Network Analysis, Food Products, MOCAF, Preference Consumers, Big Data, Agricultural Development

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1 Introduction

The performance of agricultural development or the agro sector in a broad sense in Indonesia in general is still far from expectations. Imports of various food, horticultural, and livestock commodities even tend to increase. Agricultural development has not been able to increase prosperity and welfare for production actors [20]. It was further said that in realizing the ideals of a sovereign Indonesian nation, one of the supports is food sovereignty as stated in Law no. 18 of 2012 concerning Food, which is certainly related to the development of the potential of local resources in guaranteeing the right to food for the people. Food sovereignty can only be realized if there are rapid changes,

The agricultural revolution must be supported by a revolution in agricultural development policies. This policy is an umbrella for the three main components of the agricultural revolution, namely the revolution in the agricultural production system, the revolution in the agricultural distribution system, and the revolution in the character of national food consumption. Indonesia's population of around 250

million people is a very large market opportunity for the agricultural product market and is a very potential source of labor. The increase in food and beverage consumption of the Indonesian population is a very significant market potential. If these needs can be met with domestic products, it can increase farmers' income significantly. Meanwhile, the wealth of agricultural products in Indonesia is an opportunity for the growth of substitute products or supplements from other products.

The development of non-rice and non-wheat food diversity in the regions can be encouraged and carried out through more integrated programs, so that food security at the household level in all regions can be guaranteed. One of the food commodities that need to be considered, especially in Java, is the development of cassava to be processed into MOCAF (Modified Cassava Flour). MOCAF is a flour product from cassava which is processed with the principle of modifying cassava cells, so that the results are different from tapioca flour. MOCAF flour can be used to make pastries, cakes, noodle ingredients and other product mixtures made from

wheat so that the results of products made from MOCAF are not much different from products made from wheat.

The existence of MOCAF flour as an alternative to the use of wheat flour will be beneficial for the national food processing industry, because with characteristics that are almost the same as wheat flour and is a local flour product, making MOCAF flour a very attractive choice. Various types of processed wheat flour products can be partially or completely replaced with MOCAF flour, so the transition from using wheat flour to MOCAF flour does not seem difficult to do. However, this condition is not as easy to do as what happens in the field. This is what underlies this research to conduct DNA analysis on consumer preferences for food products made from MOCAF raw materials.

2 Literature Review

Theories that explain the relationship between attitudes and behavior include the Theory of Planned Behavior (TPB). Previously in the Theory of Reasoned Action (TRA) it was stated that the intention to perform a behavior had two main predictors, namely attitude toward the behavior (attitude towards behavior) and subjective norm (subjective norms). The development of this theory (TRA) is the theory of planned behavior which finds other predictors that also affect the intention/intention to perform a behavior by including the concept of perceived behavioral control.

Ajzen (1991) and Taylor & Tood (1995) state that behavioral intention indicates a person's decision to perform or not to perform a certain behavior [1][22]. The concept of behavioral intention states that an individual's motivation to engage in behavior is defined by the attitudes that influence the individual's behavior. Behavioral intentions indicate how much effort an individual puts into committing to a behavior. The amount of a commitment defines the realization of the behavior. The concept of intention is closely related to this intention as mentioned. That behavioral intention shows how much effort an individual puts into committing to a behavior. The amount of a commitment defines the realization of this behavior [17].

Various theories of consumer behavior state that human needs are not only met by motivation but also external things such as cultural, social and economic. Purchase decisions and product choices are often influenced by psychological impulses. It is not uncommon for consumers to decide to choose and consume certain products in the context of self-actualization as well as a means of entering the

expected community. In this case, we know that the product is not designed to meet the functional needs alone but also to satisfy the social and psychological needs of the consumer.

Expectancy disconfirmatory theory with performance approach is often used in studying consumer satisfaction. This theory explains the degree to which the performance or performance of products/services exceeds consumer expectations. Disconfirmation is the difference between expectations before making a purchase and expectations after buying [13]. He further explained, there are three types of disconfirmation, namely positive disconfirmation occurs when the performance of the product/service consumed exceeds expectations, on the contrary negative disconfirmation occurs when the product/service performance is below expectations, meanwhile neutral disconfirmation occurs when the performance of the product/service is in accordance with expectations (hope).

The era of free trade is a commitment in the context of international life which must be faced with full competition [19][15]. Marketing is an important factor in industrial activities related to meeting consumer needs and desires [7][18]. Therefore, increase the value of the product must be a long term goal [5][14]. The government must find new breakthroughs to face the ever-changing market [3][6][8]. According to the American Marketing Association in Kotler and Keller (2008) that marketing is an organizational function and a set of processes for creating, communicating and delivering value to customers in order to manage customer relationships in ways that benefit the organization and those who expect the organization. Furthermore, it is said in Kotler and Keller (2012) that marketing is a total business activity designed to plan, determine prices, promote and distribute products and services with the desire to satisfy consumer needs which are expected to be able to anticipate global developments [10].

According to Kotler & Armstrong (2012), marketing is a process by which companies create value for customers and build strong customer relationships to capture value from customers in return. This opinion can be interpreted, marketing is a social process that makes individuals or groups obtain what they need and want through the creation and reciprocal exchange of products and value with others [16]. Meanwhile, Salomon (2003) defines marketing management as the process of planning and implementing thought, pricing, promotion and distribution of ideas, goods and services to create

exchanges that satisfy individual and organizational goals.

Gerald Z. and Melanie Wallendorf (1979) in Mangkunegara (2002) explain that consumer behavior is the actions, processes, and social relationships that individuals, groups, and organizations undertake in obtaining, using a product or other as a result of their experience with products, services, and other resources [12]. Kotler and Keller (2008) consumer behavior is the study of how individuals, groups and organizations choose, buy, use and place goods, services, ideas or experiences to satisfy their wants and needs [11]. The same thing was conveyed by Hawkins and David (2010), consumer behavior is a field of science that studies how individuals, groups and organizations choose, make purchases, use, and utilize goods, services, ideas [9].

Meanwhile, Sumarwan (2014) explains that consumer behavior is all activities, actions, and psychological factors that encourage these actions before buying, when buying, using, spending products and services after doing the things above or evaluating activities [21]. Based on these definitions, it can be concluded that consumer behavior is all the activities of individuals, groups and organizations in searching for, buying, using, evaluating and disposing of products, services and ideas that can satisfy their needs and desires.

The analysis used in this study is one type of sentiment analysis, namely Discourse Network Analysis (DNA), which is an analysis used to obtain actors and issues from consumer preference problems. The source of this analysis is news or statements on social media regarding consumer preferences.

3 Method

The data used in this study is data from digital newspapers. The data was then analyzed by Discourse Network Analysis (DNA). Sources of DNA data come from various information in cyberspace (mass media, journals, articles, and others) in accordance with the research context. The content is then used for DNA analysis by processing it on the Discourse Network Analyzer software. In DNA data processing, statements, actors, concepts/issues, sentiments, along with the origin of the organization will be generated.

Discourse Network Analysis (DNA) can be used to process unstructured text data which can later be concluded based on the results of data processing (Benny, 2020; Fernandes et al., 2014) [2][3]. Data processing is done through the Visone software. Data processing using this software is to import text data

consisting of actors (characters), institutions, and statements of the actors (characters). Then the statement of the actor (character) can be coded manually. The next step based on the results of the encoding can be converted into network data. Through network data, it is possible to know the actors (characters) and the issues discussed regarding MOCAF consumer preferences.

4 Conclusion

Based on the results of the Discourse Network Analysis (DNA), two things were obtained, namely issues and actors in the organization related to consumer preferences for food products made from Modified cassava flour (MOCAF). The results of DNA analysis on content obtained from cyberspace are presented in the form of a chart as shown in Figure 1 below.



Figure 1. Actors and Issues of Food Products Made from Modified Cassava Flour (MOCAF)
Source: Researcher Process, 2021.

In Figure 1, the results of the Discourse Network Analysis are presented using the Visone software. In the picture there is a black circle icon that shows the actors in consumer preferences for food products made from Modified Cassava Flour (MOCAF) and a black square icon that shows the issues in the topic. On the other hand, there are lines connecting the circle and square icons. Thus, the line shows the results of mapping the relationship between actors and issues on consumer preferences for food products made from Modified Cassava Flour (MOCAF). The green line in the figure shows the narrative of positive sentiment, the red line shows negative sentiment, while the blue line shows some discourses that contain positive and negative sentiment results.

Based on Figure 1, similar issues are further grouped into main issues. These actors and issues were analyzed by DNA, with the results in the form of a chart as presented in Figure 2 below.

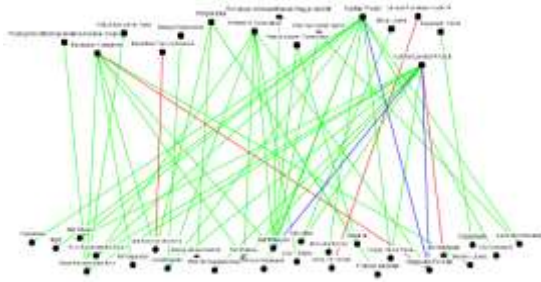


Figure 2. Main Issues of Food Products Made from Modified Cassava Flour (MOCAF)
 Source: Researcher Process, 2021

In Figure 2 there is also a black circle icon that shows actors in the organization on consumer preferences for food products made from Modified Cassava Flour (MOCAF) and a black square icon that shows the issues in the topic. The green line shows the narrative of positive sentiment, the red line shows negative sentiment, while the blue line shows some discourses that contain positive and negative sentiment results.

Based on topic searches regarding consumer preferences for food products made from raw materials Modified Cassava Flour (MOCAF), in accordance with this study, several issues/concepts were obtained that could be explored further as consideration for displaying complete data. These issues can then be classified into main issues. The main issues relevant to food products made from Modified Cassava Flour (MOCAF) can be reduced to several concepts. The mapping of issues into issue concepts can be seen in Table 1 below.

Table 1. Analysis of the Concept of Issues

No .	Issue	Issue Concept	Sentiment
1	MOCAF flour is a source of local food-based carbohydrates besides rice	Uses of MOCAF	Positive
2	The pattern of MOCAF development in Banjarnegara deserves to be imitated	Product quality	Positive

3	Cassava has the most potential as a local food source		Positive
4	Balitbangtan develops MOCAF production technology by improving the quality parameters of cassava flour		Positive
5	Based on the tuber structure, there is mucus where the concentration of HCN is under the skin which affects the low quality of the tubers		Negative
6	Better use of cassava with low cyanide acid content		Positive
7	Cassava that is good for flour is young and middle cassava which has the maximum amount of starch		Positive
8	Suggestions for making your own flour by LIPI		Positive
9	MOCAF strives to improve product quality and safety assurance		Positive
10	Products without chemicals		Positive

11	MOCAF craftsmen in Banjarnegara need to maintain the quality and safety of their food products		Positive
12	MOCAF craftsmen in Banjarnegara need to maintain the quality and safety of their food products		Positive
13	Noodle texture and taste is better		Positive
14	The main raw material for cassava brownies		Positive
15	Advantages of cassava flour		Positive
16	Stable supply of main raw materials is important for cassava brownies business actors		Positive
17	The taste of the product produced from MOCAF flour is not much different from wheat flour		Positive
18	Cassava-based noodles have a high protein content and are safe for consumption		Positive
19	Mo Mie made from MOCAF and tempeh flour		Positive

20	Cassava is a potential source of carbohydrates		Positive
21	Advantages of moncaf		Positive
22	Cassava production has decreased due to decreased productivity and land area		Negative
23	MOCAF technology can engineer to improve quality		Positive
24	The principle of making MOCAF flour causes changes in better characteristics karakteristik		Positive
25	Low IT usage which causes low product quality kualitas	Product Service Quality	Negative
26	MOCAF tepung flour development		Positive
27	MOCAF flour processed products are selling well		Positive
28	Help the noodle maker and put it into practice		negative
29	Production Permit		Positive

30	Raise the degree of cassava by making processed products		Positive
31	MOCAF Banjarnegara Association tries to fulfill the HACCP concept		Positive
32	Land potential and production of MOCAF flour		Positive
33	MOCAF flour safety standard		Positive
34	Positive effect on Indonesia if MOCAF flour is exported		Positive
35	Cassava brownie business capital is not big		Positive
36	MOCAF production advantage is 5 times increase		Positive
37	Cassava farmer cluster system can increase MOCAF flour production		Positive
38	Price and quality of cassava		Positive
39	Cassava flour has properties that cause cassava flour processed products	Consumer Satisfaction	Negative

	to be less preferred and have low economic value due to aroma, color, taste, and texture		
40	MOCAF flour noodles are liked by the public		Positive
41	MOCAF flour demand from overseas market pasar		Positive
42	Persistence and persistence in selling MOCAF		Positive
43	During the COVID-19 pandemic, belief in the power of science and nutrition has a positive impact on people's lives		Positive
44	Strengthening food is important because there are many FOI findings in the field which show that vulnerable people are still hampered by access to food, especially for toddlers due to economic constraints and parenting patterns.		Positive
45	MOCAF flour is healthier and has almost the same benefits as wheat flour and is suitable for various processed products	Consumer Preference	Positive

46	Making food based on MOCAF flour		Positive
47	Making food based on MOCAF flour		Positive
48	The slow food movement raises the diversity of local foods and ingredients		Positive
49	Lilly has implemented a slow food diet		Positive
50	MOCAF tepung flour development		Positive
51	Types of instant noodles for sale		Positive
52	Noodles are accepted by the community and the beginning of marketing noodles		Positive
53	Many people are interested in learning how to make moncaf noodles		Positive
54	MOCAF noodles are suitable for Japanese society and there are plans for cooperation		Positive

55	MOCAF flour prices vary		Positive
56	MOCAF flour as an alternative to wheat flour		Positive
57	Positive effect on Indonesia if MOCAF flour is exported		Positive
58	Reasons for being interested in becoming a moncaf producer		Positive
59	The slow food movement raises the diversity of local foods and ingredients		Positive
60	Development of cassava processing	Local food	Positive
61	MOCAF tepung flour development		Positive
62	Hope for Indonesia to be food sovereign		Positive
63	The economic impact at the household level greatly affects the fulfillment of children's basic needs, namely food. The problem of child nutrition is one of the socio-economic risks caused by the	Impact of the Covid-19 Pandemic	Negative

	COVID-19 pandemic.		
64	cassava brownie product turnover	Product turnover	Positive
65	Working capital to produce MOCAF	Venture capital	Positive
66	MOCAF's wide sales reach	Marketing strategy	Positive
67	MOCAF flour raw material needs	Raw material requirements	Positive
68	Indonesia is the 2nd largest cassava producing country in the world, but the farmers are still poor	Indonesia import quantity	Negative

Source: Researcher Process, 2021

Table 1 above shows that there are 12 issue concepts which can then be compiled into minor propositions. It is understood that local food and the use of MOCAF are the driving force and influence various aspects of life. In this regard, the following proposition can be formulated.

- 1) Local Food determines Raw Material Needs
- 2) Local Food determines Business Capital
- 3) The use of MOCAF determines Raw Material Requirements

Related to consumer preferences, aspects of business capital and raw material needs are important. Some things are levers of business capital and raw material needs, for example related to quality. This can be a perspective in formulating the following proposition.

- 4) Business Capital determines Product Quality

- 5) Business Capital determines Product Service Quality
- 6) Business Capital determines Indonesia's Import Quantity
- 7) Raw Material Needs determine Product Quality
- 8) Raw Material Needs determine Product Service Quality
- 9) Raw Material Needs determine Indonesia's Import Quantity

Then several things are levers of product quality, product service quality, and the quantity of Indonesian imports. This can be a perspective in formulating the following proposition.

- 10) Product Quality determines Consumer Satisfaction
- 11) Product Quality determines Consumer Preference
- 12) Product Service Quality determines Consumer Satisfaction
- 13) Product Service Quality determines Consumer Preference
- 14) Indonesia's Import Quantity determines Consumer Satisfaction
- 15) Indonesian Import Quantity determines Consumer Preference
- 16) Consumer Satisfaction determines Consumer Preference

Consumer preferences for MOCAF products should pay attention to Consumer Satisfaction, Marketing Strategy, and the Impact of the Covid-19 Pandemic to increase the turnover (profit) obtained. Therefore, the following proposition can be formulated.

- 17) Consumer Satisfaction determines Product Turnover
- 18) Consumer Preference determines Product Turnover
- 19) Marketing Strategy determines Product Turnover
- 20) The Impact of the Covid-19 Pandemic determines Product Turnover

These propositions become perspectives in the preparation of the following propositions.

Local Food determines Consumer Preference on food products made from MOCAF

- 1) The use of MOCAF determines consumer preferences for food products made from MOCAF
- 2) Raw Material Needs determine Consumer Preferences on food products made from MOCAF
- 3) Business Capital determines Consumer Preference on food products made from MOCAF
- 4) Product Quality determines Consumer Preference on food products made from MOCAF

- 5) Product Service Quality determines Consumer Preference on food products made from MOCAF
- 6) Indonesia's Import Quantity determines Consumer Preference on food products made from MOCAF
- 7) Consumer Satisfaction determines consumer preferences for food products made from MOCAF
- 8) Consumer Preference determines Consumer Preference on food products made from MOCAF
- 9) Marketing Strategy determines Consumer Preferences on food products made from MOCAF
- 10) The impact of Covid-19 determines consumer preferences for food products made from MOCAF

Based on these minor propositions, the concept of issues can be divided into three parts (groups). First, the input issue which consists of issues related to Local Food, Use of MOCAF, Basic Material Needs, Business Capital, Product Quality, Product Service Quality, and Indonesian Import Quantity. Second, the process issue which consists of issues related to Consumer Satisfaction, Marketing Strategy, and the Impact of Covid-19. Third, the output issue which includes the issue of Consumer Preference and Product Turnover. The interrelationships between the sections (groups) of these issues can be used to construct major propositions. Thus, the major proposition can be formulated as follows.

- 1) Input issues affect process issues
- 2) Process issues affect output issues
- 3) Output issues affect consumer preferences for food products made from MOCAF

Theories or models can be presented in one or a combination of the following 3 forms:

- a. Verbal formulation. In this form it means that the theory or model is presented in a series of descriptions which are theoretical statements.
- b. Mathematical formulation.
- c. Curves, graphs or displays.

By referring to this perspective, from the minor and major propositions that have been mentioned, the sub-models in analyzing Consumer Preferences on food products made from MOCAF based on the concept of issues can be arranged as follows.

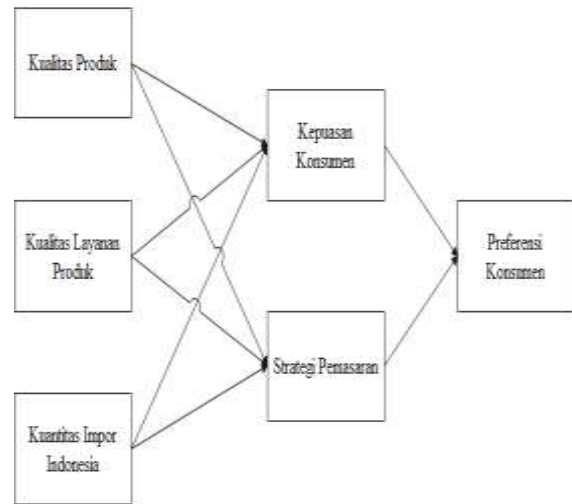


Figure 3. Formed Variables

Source: Researcher Process, 2021

5 Conclusions and Suggestions

Based on DNA analysis, five variables were obtained regarding consumer preferences for food products made from MOCAF. The five variables are product quality, product service quality, Indonesian imports quantity, consumer satisfaction and marketing strategy. In addition, the variables formed from DNA analysis are thought to have the following relationships:

- 1) Product quality determines customer satisfaction
- 2) Product quality determines marketing strategy
- 3) Product service quality determines customer satisfaction
- 4) Product service quality determines marketing strategy
- 5) Indonesia's import quantity determines consumer satisfaction
- 6) Indonesia's import quantity determines marketing strategy
- 7) Consumer satisfaction determines consumer preferences
- 8) Marketing strategy determines consumer preferences

So that the advice given is based on the results of DNA analysis, namely when you want to know consumer preferences for food products made from MOCAF raw materials, it is necessary to pay attention to the variables of product quality, product service quality, Indonesian imports quantity, consumer satisfaction and marketing strategy.

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