

ANALYSIS ON THE SUBSTITUTION ABILITY OF MOCAF TOWARD WHEAT FLOUR, ITS BUSINESS FEASIBILITY, AND ITS INDUSTRY MULTIPLE EFFECTS

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ABSTRACT

The production of Modified Cassava Flour (mocaf) in SMEs scale in South Kalimantan area was not feasible considered from its business feasibility hence the multiple effect was unmeasured based on its industry existence. Mocaf production derived from cassava, which is a plant that not only match on dry land but also in the wetlands of South Kalimantan, can be oriented by consumer as a substitution for wheat flour for common food products in the society. Therefore, further research refers to aspects mocaf premium for health. The objective of this research was to increase the society consumption of mocaf for the healthy reason related to the trend on negative effect from high level of gluten in wheat flour. The laboratory test showed the result that supports mocaf product for health. With this consideration then mocaf processed product has potentials to be developed though serious marketing effort is required due to infamiliarity of the mocaf especially in South Kalimantan area. Difference test result showed that prospects, indeed, have intention to purchase mocaf-based processed products for healthy reason.

Keywords: mocaf, wheat flour substitution, South Kalimantan

INTRODUCTION

Tanah Laut as one of the regencies in South Kalimantan has a great potential to exploit its natural, like the sea and its riches, and its contents forest, minerals and quarrying as well as soil fertility. One result is the cassava plantation. Cassava is a plant that not only matches on dry land but also in wetlands. Haryadi (2011) states that the potential productivity of cassava to support food security. Cassava can be made into Modified Cassava Flour (mocaf). Mocaf is a product derived from cassava flour that uses the principle of modified cells cassava fermentation (Anindita et al, 2014; Muhshi, et al. 2014; Nurlienda, 2014; Tandrianto et al., 2014; Qanytah et al., 2012; Budiarto, 2011), mocaf is able to be a product flour substitution. However, the results showed the lack sanctified mocaf starch production for

the micro scale in Tanah Laut (Firdaus et al., 2014). The cause was the relatively high production cost especially the price of mocaf raw ingredient namely cassava which was quite expensive in the area of Tanah Laut. This situation caused higher selling price of mocaf compared with the price of wheat flour.

The alternatives to overcome the problem were by selling mocaf-based ingredient products such as: cakes, snacks, and other food processed products. These food processed products were served by accentuating the advantages of health benefits of mocaf compared with wheat flour. This way was more feasible to be done by SMEs actors since it did not require high cost. Besides, nowadays, public awareness toward the importance of health through food products has increased.

Current food products are generally wheat flour-based ingredient that contains gluten. However, not everyone can digest gluten in the metabolism. Kusumayanti (2011) stated that gluten was a contributor toward the complaints of diarrhea, movement and emotion hyperactivity, and sleep disorder.

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Muloy (2011) in Risti (2013) stated that individual allergic to gluten, such as people with celiac disease and autism spectrum disorder (ASD) must avoid gluten to prevent and decrease its negative impact to the body. Gluten is protein derived from grains plants such as wheat, oat (cereal/*Avena Sativa*), barley (kind of wheat for making beer), rye (black wheat), malt (wheat yeast) and other similar plants. Different from food products with tubers base, mocaf was claimed as one alternative for main food product which is gluten free (Risti, 2013). The easy access for gluten free food product will facilitate treatment toward people suffering from celiac disease and autism spectrum disorder since the diet program will not require special attention, therefore focus can be given to other relevant healing process. Health quality improvement potential becomes higher considering the composition of people with the disease in the society. Tanjung et al (2015) stated a proper diet is a diet GFCF (gluten free casein free) to avoid further behavioral disorders such as hyperactivity. Syahrir (2012) informed that based on Statistic Central Board in 2010, the number of people with autism reached 2.4 million people with predicted increase around 500 people per year. Health Ministry in Syarifah (2014) said that the number of children suffering from autism in Indonesia was relatively high.

Meanwhile, celiac disease is a contributor toward malnutrition case in children and adults. Celiac is a digestive disease which disturb small bowel and disturb nutrition absorption from food, and the sufferer cannot digest the gluten, and it is stated as a genetic disease. For people with celiac, the body immunity responds gluten in the body by disturbing or destroying the coating of small bowel/villi which functions to absorb nutrition through the bowel wall to blood flow. Without healthy villi, someone becomes lack of nutrition, regardless how much food he consumes. *National Digestive Diseases Information Clearinghouse* (2006) stated that in babies and children, the symptoms are: bloated and pain in the stomach, chronic diarrhea; vomiting, constipation, pale, stinky

or fatty feces; and decreasing weight. National Development Planning Ministry in Sulfa (2013) recorded more than 8 million Indonesian children were lack of nutrition in 2013. Society's gluten consumption hence should be decreased for healthy reason.

Based on the previous explanation mocaf has urgency in the substitution of wheat flour for the sake of Indonesian people health in the long term. It is crucial for the people to have easy access to mocaf and the processed products in various scales. The distribution and marketing of mocaf need support from all parties to be socialized. Potentials of other substances contained in mocaf which are health-friendly are still expected, and that mocaf has direct contribution toward people's health to strengthen Indonesian national defense through its role in improving and increasing the quality of society's health based on Indonesian local raw ingredient namely cassava. The formulation of the problem for this research is how to increase the consumption of mocaf by the public for health reasons related to the tendency of the negative impact of high levels of gluten in the flour.

MATERIALS AND METHODS

Data collection techniques used are: (1) Comprehensive Interview, direct interview done comprehensively with the respondents of this research, (2) Experiment, that is the activity of experimenting of product making from mocaf with various composition based on certain standards, (3) Observation that is the activity done by observing the real condition directly, (4) Documentation, to collect secondary data about the condition of surrounding society mainly seen from the ones who are aware with health. Research method used was qualitative method known as phenomenology. As an addition, SWOT analysis was used in the making of marketing plan model that was supported by t-test for the difference test. Then marketing application for mocaf and the processed product was conducted.

Research Method

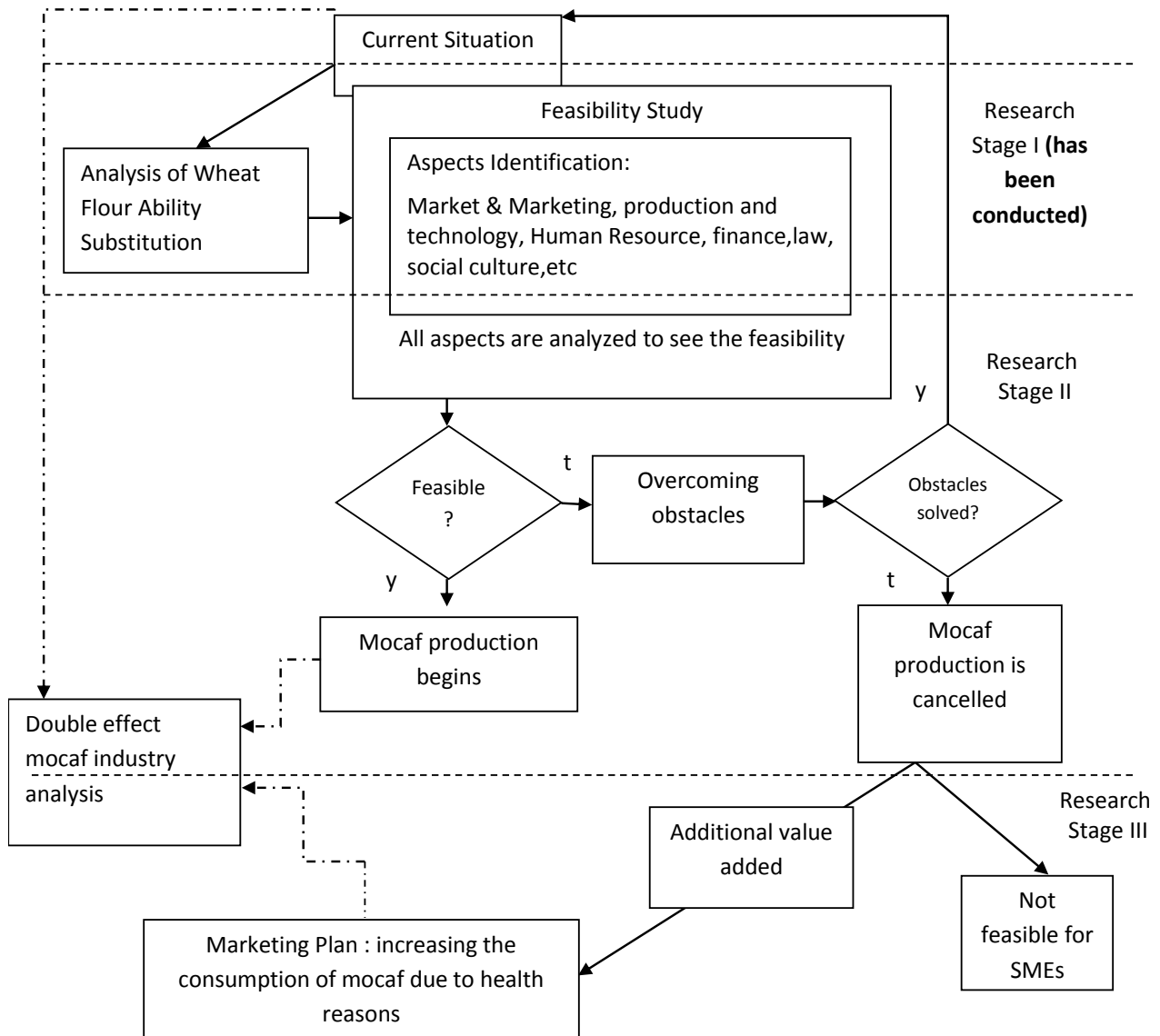


Figure 1. Research conceptual framework

RESULTS

Mocaf Marketing Strategy

The mocaf marketing strategy in Tanah Laut Regency can be seen by the scope of marketing, marketing objectives, allocation of resources, competitive advantage and synergy. Based on the scope, market target for mocaf is consumer groups that need gluten free flour. In general, gluten free flour is used for health treatment oriented consumption. Mocaf as gluten free flour is very beneficial to be consumed by people with autism and celiac disease as one of the ways to avoid the bad impact for the sufferer if they consume flour with gluten.

Mocaf can be sold in the form of mocaf as raw food ingredient by packing it in various size of package. Besides, mocaf also can be marketed by processing it into various food processed products apt to consumers' appetite. The extent and broad lines of food processed products can be judged by the ability of mocaf to be made as food processed products such as many kinds of cakes, cookies, nastar, kaasstengel, layer cake, brownies, etc. It is suggested that the selling of mocaf both in the form of flour and in various food processed products using good packaging to avoid bacterial contamination. Next, branding policy is an important for mocaf marketing activity considering its huge benefits. Consumers' trust is better toward mocaf which marketed with certain branding. This happens since, commonly, consumers still think that branding is one of the assurances for what they consume.

Product-market development plan for mocaf is by focusing on consumers. Focus on the ever changing needs and an expectation of consumers from time to time is the milestone of product-market development plan. A carefully set plan for the needs of consumers for mocaf developing product-market is expected to answer big challenges in marketing mocaf. Product lines plan then can be adapted with the change of consumers' needs and expectation in the future.

Refer to its marketing objectives, marketing product bonds with the main objective of its business activity. For commercial business activity the main objective must be the big amount of profit. However, it is important to note, the big amount of profit obtained from high selling of product must be accompanied with the fulfillment of consumers' needs and expectations to insure their satisfaction. The amount of money they spend will not be a problem for the consumers once they get what they need and expect by purchasing the product.

The activity of mocaf selling must take into account the needs and expectations of the consumers for the mocaf. Mocaf which has better content than wheat flour, that is gluten-free and is very beneficial to be consumed by people with autism and celiac disease must consider various aspects to fulfill health standards. The quality of mocaf must be well maintained hence it is safe for consumption. Expiry date for the flour consumption is very important and has to be set carefully. Safety assurance for consuming mocaf to make consumers truly get the great benefits from mocaf consumption is a starting point to achieve consumers' satisfaction.

Resource allocation for mocaf covers identification on marketing plan components. Things that must be taken into account for specific product market of mocaf are marketing mix elements which consist of product, price, distribution channel and promotion. Viewed from the side of product, mocaf is a product that has differentiation in flour product class. Mocaf is unique in its content, that is free from gluten and it is very beneficial to be consumed by people suffer from autism and celiac disease. From the price point of view, with the assumption of micro production scale, mocaf will be sold with higher price than wheat flour, however this will not become a concern for the market continuity considering the high price of mocaf comes with added values of the mocaf. From the distribution channel point of view, mocaf as a product included in food ingredient

product category hence the distribution channel used for mocaf must be intensive distribution channel. This is done in order to make mocaf available in various kinds of retails anywhere. Next, from the promotion side, mocaf has to use promotion tool that can reach mass; advertisement for example. By doing this it is expected that mocaf will become familiar and makes people completely aware of the benefits of mocaf as a product that has good advantage. In the end this can be one motivation for the consumers to purchase mocaf.

The competitiveness of mocaf lies in differentiation of its product. As a product that has differentiation, mocaf should be able to position the product well in the market. Product differentiation is a plus point that should be used to develop its business strategy. This condition has made mocaf as specific product-market that must be handled properly. Mocaf competitiveness also means that there is a way or more that cannot be or will never be caught up by its competitors. Furthermore, it is expected that mocaf competitiveness is a sustainable competitiveness.

Competitive advantage owned by mocaf is able to open up a market for processed products such mocaf. The t-test disparity test was performed for two consumer groups, those are group of consumers prioritizing health and group of consumers prioritizing taste. The t-test disparity test is used to determine whether two different samples have different value average (Ghozali, 2013: 64). Test is conducted to identify whether there is different interest in buying the product between consumers prioritizing health and consumers prioritizing taste.

The test results showed that the calculated F value is 2.408 with a probability of 0.132. This means that the probability is $0.132 > 0.05$ so that it can be concluded that H_0 is accepted or that H_0 has the same variance. Thus, t-test disparity test analysis uses equal variance assumed. Based on the test results, it can be seen that t value of equal variance assumed was 1.250 with a probability of 0.222. This means that the probability is

$0.222 > 0.05$ so that it can be concluded that H_0 is accepted. This means that the average interest in buying mocaf processed products among consumers prioritizing health and consumers prioritizing taste is the same.

Based on the conclusions derived from the test results, then interest in buying mocaf processed products among consumers prioritizing health and consumers prioritizing taste is the same. It shows that the health benefit brought by mocaf has awaken consumers interest to buy the product, at the same time it also shows that mocaf taste is as good as wheat flour. Thus, not only consumers prioritizing health are interested to buy mocaf but also consumers prioritizing taste are interested to buy mocaf. This shows that mocaf will have a good market if it is put in the markets.

Basically, mocaf has the bases that will make it has sustainable competitiveness. It is because mocaf has composition which is different from other flours. Mocaf is gluten free flour which is good for health, especially for those who suffer from autism and celiac disease. Sustainable competitiveness of mocaf is not solely developed from its product differentiation but it is also developed by the support of consumers' mind set. The mindset that is embedded in the minds of consumers must touch on the understanding that mocaf competitive advantage is actually the advantage of consumers. With its unique character, mocaf will make consumers feel how much they are really cared for and how important their health is. This will give the product high value for the consumers and will result in consumer satisfaction and at the end will cause more purchases by the consumers.

Finally review the synergy, successful marketing of mocaf is not only determined by one particular factor. There are many factors that must work hand in hand to realize mocaf successful marketing. Differentiation which is brought as mocaf superior point will work best if it is supported with business capital, good quality raw material, good manufacturing technology, excellent human resources and the ability to market the product

properly. Combinations of accuracies will put mocaf as unique flour. Accuracy in determining the price, accuracy in establishing mocaf distribution channel, and also accuracy in promoting mocaf to the society will definitely support the success of mocaf marketing. Thus, it can be concluded that the synergy in marketing strategy is a very important factor that must not be taken lightly. Good synergy will bring in great benefits. This will eventually have broad impact to marketing activities so that marketing activities can be managed properly.

DISCUSSION

Mocaf Processed Product Marketing Plan

Mocaf substitution capability of the wheat is 68% (Firdaus et al, 2014). Production for small and medium scale is not economically viable (Firdaus et al, 2014). However, considering the quality and health benefits, it is suggested that people in South Kalimantan start consuming mocaf in addition to wheat flour. The people who have variety of flour base culinary and are used to gluten are expected to be more aware of their health by using mocaf in their ingredient or as additional ingredient.

At present, what is needed to be done is introducing mocaf to the society. The approach used to introduce mocaf to the society is focus differentiation strategy. This strategy is used because the focus will on the unique characteristics owned by mocaf namely its high fiber and its low calories making it is suitable for those with diabetes. Another health benefit offered by mocaf is its low gluten. For those suffering from autism and celiac disease, gluten is hard to digest because their digestion is not functioning optimally. Thus, it is good for these people to consume mocaf because mocaf is low in gluten. To realize the consumption of mocaf, mocaf base products substituting wheat flour need to be created. In order to make these products market success, a good marketing plan that will lead to successful marketing must be made.

Marketing Plan performed for refined flour products mocaf include situation analysis, SWOT analysis, positioning and marketing mix. The situation analysis includes: (1) Target market. The target market for mocaf processed products is people suffering from autism, celiac disease, and diabetes. This is in line with laboratory analysis showing that there is no total sugar in mocaf. (2) Behavior Factor. Consumers who consume mocaf processed products can avoid the adverse effects of indigestion and increasing hyperactivity. Increasing hyperactivity that can be avoided is not only physical movement, but also emotion such as outrage, anger and sleep disorder. (3) Market need. Mocaf processed products are presented as attractive products for consumers. Mocaf processed products can be made into a variety of food products such as cookies and cakes.

SWOT Analysis

Judging from the internal side, which is owned mocaf SMEs capabilities compare to the capabilities possessed by its competitors. From this comparison, it will be identified whether these SMEs capabilities are their strength or their weakness. If mocaf SMEs capability exceeds its competitor's capability, then it is its strength. On the other hand, if mocaf SMEs capability is lower than its competitor, then it is its weakness. Viewed from its external surrounding, data and information emerging are in the form of opportunities and threats faced or maybe be faced by mocaf SMEs. Opportunity illustrates the opportunities that can be exploited by mocaf SMEs to develop further, while threat is a condition that can cause harm or pose an obstacle for them to develop their business and can even lead to bankruptcy or closure of the business.

Mocaf SMEs strength lies on its technical production. There are only few SMEs that can produce mocaf, although mocaf is relatively easy to make and does not require sophisticated technology.

It means that those mocaf SMEs which know how to produce mocaf have the strength

that is their capability to produce mocaf compared to those SMEs which do not know how to produce mocaf. The weakness of mocaf based processed products is the lack of modern equipment owned by small entrepreneurs (SMEs) so they use simple equipment. Consequently, it results in high cost of mocaf production.

Opportunities that could be taken by mocaf SMEs are as follow: (a) since there are only SMEs having the ability to produce mocaf, it brings big benefit for mocaf SMEs that is fewer competitors in the same business so that the opportunity to have higher selling income is widely open. (b) more and more consumers are aware of the importance of health. This is proven by increasing number of natural organic base food and drink products. Likewise, medicinal products currently growing rapidly are drugs and supplements made from herbs. The main benefit presented from mocaf processed product is its health benefit that is this product is good and suitable for those suffering from autism because mocaf is low in gluten. Mocaf is also good for people with diabetes because it has low sugar and high fiber.

Generally, the considerations in selecting processed food product to consume are from the products' health benefits and taste. Considerations on what great benefits food products offer should be on the top list, not their taste. For people prioritizing their health, they will buy products that will give great benefits for health without paying attention to the product taste. Nevertheless, fact shows that there are people who choose taste over the health benefits. For these people, they will choose tasty food product although the food products do not give great health benefits. The preference of prioritizing health by ignoring the taste is considered as a wise choice, while the preference of prioritizing taste over health benefit is certainly seen as an option that should be reconsidered.

Considering the fact above, it can be said that if a food product only offers health benefits not the taste, then probably this product will only be bought by people who

prioritize their health. On the other hand, if a food product has great taste although it does not offer health benefits, then probably this product will be bought by people prioritizing taste. At the end, it can be concluded that if a food product offers both health benefits and great taste, then there is a big possibility that product will be bought by both people prioritizing health and taste.

Mocaf processed products are processed food products offering health benefits and also great taste. This means that mocaf processed products fulfill the needs and desires of all segments, both market segments of people prioritizing health and market segments of people prioritizing taste. For consumers prioritizing health, they will get not only great health benefits when they consume mocaf processed products but also great taste. As the consumers who prioritize taste, they will enjoy great taste when they consume mocaf processed products, at the same time they will also get the health benefits. Combinations of health benefits and great taste at the end fulfill the needs and desires of consumers, not only those prioritizing health but also those prioritizing taste. So, it can be concluded that mocaf processed products has high feasibility to be produced and marketed.

The threats faced by entrepreneurs mocaf processed products are high prices of raw materials such as cassava. Compared to the price in Java, the price of cassava in South Kalimantan is considered high; one kg of cassava is Rp. 3,500, while in Java one kg of cassava is around Rp. 1,000. High cassava price causes high mocaf price, thus the price of mocaf processed product is also high. While the price of wheat flour is Rp. 8,000 to Rp. 11,000 per kg, mocaf price in South Kalimantan is around Rp. 12,000 to Rp. 14,000 per kg. This has resulted in lower competitiveness of mocaf.

Positioning

Mocaf base processed products are in the form of products good for health, especially for those suffering from autism, celiac disease

and diabetes. Due to its health benefits, price position can be put higher than similar products basing on wheat flour. In other words, this product should be focused for people in middle and upper class.

Marketing Mix

Mocaf processed products can be modified into variety of products that are preferred by consumers. Food products created are like cookies and cakes. Product should be packed with hygienic packaging. Product should come in different sizes. As for selling price, the price of mocaf processed food product should be profitable for the producers. This is done by adding margin to the cost of product making. The distribution channel used must be able to reach market consumers of this product. Sales can be done through traditional retail and modern retail. Product promotion of mocaf processed product can be done by spreading information about great benefits of mocaf processed products. Promotion can also be done through advertisement and sales promotion.

Mocaf has the ability to be a good substitution (approximately 68%) of the wheat flour at different levels of substitution. In addition, the use of mocaf instead of wheat flour can lower production costs businesses that initially using wheat as the basic ingredients of their products. Net savings that can be obtained with the application of this substitution is a decline in fee of 23% of the cost if using mocaf (Firdaus et al., 2014). Mocaf is cassava flour that has been modified by treatment with fermentation, to produce cassava flour with characteristics similar to wheat so can be used as a substitution for wheat flour or flour mixture 30% - 100% and can reduce the cost of flour consumption 20% - 30% (Nurlienda, 2014). Cassava flour can replace wheat flour and 20% for economic reasons (Salvador et al., 2014).

However, production of mocaf declared unfit at the level of SMEs in Tanah Laut. The production process is traditional and uneconomic. Cassava flour production activities are pretty expensive or high costs in

Tanah Laut reGENCY and Banjarmasin as the regions test. The alternatives to overcome these obstacles are to highlight the advantages of health benefits mocaf than wheat flour. Thus it can be made a variety mocaf-based product, such as cake (dry and wet), snacks and other processed food products.

Martiyanti et al. (2015) revealed that mocaf is a product as a result from cassava fermentation, powder form, can be processed into various kinds of food such as noodle, snacks, cakes and other kinds of food that are generally made from wheat or rice flour. Mocaf has some superiority compared with other tubers flour due to its similar characteristics with wheat therefore it is potential as a wheat substituent. Frediansyah et al. (2012) stated that mocaf should be conducted to increase the value of cassava as food product and one of important ways to decrease wheat flour consumption by substitution. Tonukari (2004) suggested that cassava is also used to produce starch for industrial purposes and other food preparations products. Qanytah et al. (2012) stated that mocaf also been tested for use in the manufacture of various foods and pastries, such as cookies, Kaasstengel and other snacks that are 100% using mocaf.

Basically, even though it is said that mocaf can be a substitution for wheat flour, if it is viewed from the content of the two flours, some differences are found. Wheat flour is famous as flour with gluten content, while mocaf is known as gluten free content. Frediansyah et al (2012) stated that mocaf doesn't contain gluten. According to Kusumayanti (2011) gluten is a protein from plants, for example wheat, oat and barley. It is known that people with allergic to gluten such as autism and celiac disease sufferer must avoid gluten. Ambarwati (2014) stated that autism is a very complex and serious neurobiologist growth disorder which include disturbance in behavior, social interaction, communication and language aspects, as well as emotional and sensoric perception and motoric aspects disorders. Children with autism are very lack of digestive enzymes;

hence food containing gluten and casein cannot be digested completely. Therefore, the two kinds of food must be avoided since they not only can cause diarrhea but also can increase hyperactivity not only for movement but also for emotion, such as trigger anger and sleep disorders.

Nurlienda (2014) stated that in people with autism, the body cannot produce enzyme to digest gluten. As a consequence, this protein becomes toxic/poisonous and disturbs brain functions, immunity system and creates behavior disorders. Therefore, mocaf is a good choice for gluten free food for the sufferer of autism.

Kusumayanti (2011) then suggested that one way that can be done to overcome hyperactivity behavior in children with autism is by food diet. The author also suggested one rule for food diet for children with autism that is by choosing gluten free food for the carbohydrate source. Tanjung (2015) stated that consumption pattern for autism sufferer is GFCF (Gluten Free Casein Free) diet. This diet can relieve digestion problems and decrease symptoms or autistic behavior. Gluten and casein are hard to digest hence children with autism must avoid products with the two proteins ingredient based.

It is known that celiac disease as a disease that disturbs digestions makes the sufferer cannot absorb nutrition well. People with celiac disease must avoid food containing gluten. Pietzak (2012) said that for those patients with celiac disease, the gluten free diet is considered medical nutrition therapy, as well as the only proven treatment that result in improvements in symptomatology and small bowel histology. Loreto and Orias (2001) stated that cassava flour can find a niche market and not as flour bread alone, but special flour, which is marketed as gluten free flour for those who suffer from celiac disease.

In regard with the explanation of the benefits of mocaf for health, it is seen as a different product compared with other flour products. As a special product, mocaf has its own differentiation. This differentiation makes mocaf has its own market and in the

end it is able to have competitive advantage. Kotler dan Keller (2009:301) said that competitive advantage is the ability of a company to work in one or more ways that cannot be imitated by the competitors. Rangkuti (2014:6) stated that competitive advantage is caused by strategy choice done by the company to grab market potentials.

Differentiation by mocaf, with no question, needs special marketing plan so that the differentiation is realized by the consumers. Walker et al. (2003:12) stated that the primary of marketing strategy is to effectively allocate and coordinate marketing resources and activities to accomplish the firm's objectives within a specific product market. Marketing strategy is a very important thing and contributes to the success of goals achievement. David (1996:78) revealed that marketing strategy develops competitive advantage by combining strategies to influence consumers and businesses, to be a collection of activity focus on integrated market.

Walker et al. (2003:11) also explained that key components of marketing strategy are scope, goals and objectives, allocation of resources, sources of competitive advantage and sources of synergy. Therefore the success of the execution of the implementation of the marketing strategy cannot be separated from these components.

CONCLUSIONS

Conclusions of this research are as follows: (1) Mocaf can substitute wheat flour, but mocaf selling price is higher than wheat flour. Considering this situation, mocaf will have bigger chance if it is marketed by showing off its health benefits in a way that it is healthier than wheat flour. (2) Health benefits come from the low level of gluten in mocaf so that mocaf is good for those suffering from autism, and celiac disease. Mocaf also contains high fiber and low level of sugar which makes it good for those suffering from diabetes. (3) Based on consumers' behavior that prefers instant/

practical products, it is better to sell mocaf in the form of processed products instead of flour. (4) Marketing plan suitable for marketing mocaf processed products is integrated marketing plan consisting of situation analysis, SWOT analysis, market integration, and positioning which use after target market that is customers who care about their health and those with autism, celiac disease and diabetes are determined.

Suggestions given to develop mocaf processed products are: (1) Capital support must be given to small scale entrepreneurs who produce mocaf processed products. This support can be in the form of modern appliances like dryers, slicers as well as support in marketing their products. (2) Municipality may require modern retailers to buy SMEs products by paying 75 % of selling price when the products are being delivered. It is intended so that the small scale entrepreneurs can use the money as their working capital. At present, payment is done weeks after the products are delivered.

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