



## Business Analysis of Puff Pastry Dough as a Gluten-free Casein-free Diet based on MOCAF Flour and Moringa Leaves for Autism Children

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### ABSTRACT

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Autism Spectrum Disorder (ASD) has a digestive disorder called intestinal mucosal hypermeability, it happens because autism children cannot digest foods that contain gluten and casein, this problem can be overcome by implementing the GFCF (*gluten-free casein-free*) diet. The purpose of this study was to analyze the dream pastry business opportunity, which is a sheet-shaped puff pastry dough applying GFCF diet therapy. This puff pastry dough is in the shape of a sheet so that it is easy to make creation foods according to the autism children's favorites. Dream Pastry product design is made from MOCAF flour as a source of gluten-free carbohydrates. It combined with Moringa leaf powder as a natural colorant. Dream Pastry's product development analysis consists of developing product concepts and developing business opportunities. The product concept development consists of processing MOCAF, Moringa leaves to the MOCAF-Moringa combination. Meanwhile, business opportunity analysis uses open a business straight in demand and the analysis of STP (Segmenting, Targeting, Positioning). The analysis were carried out using Market Sizing, while the market potential prediction used TAM (Total Available Market) of autism children recorded in Indonesia as many as 16,987 students. Then, for the SAM (Served Available Market), the author chose East Java as the initial market niche for product distribution. Also, the prediction of sales in the first month called SOM (Share of Market) as many as 106 boxes.

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### I. Introduction

Based on data from the Ministry of Education (2019), The number of students with autism has increased to reach 16,987 children. Various therapies can be given to ASD (Autism Spectrum Disorder) children according to the problem they are experiencing (Hasdianah, 2013). Gusti (2019) found the main problem in ASD children, namely the inconsistent application of Gluten Free Casein Free (GFCF) therapy. According to Kusumayanti (2011), GFCF therapy is a therapy to reduce food menus containing gluten and casein so as not to increase intestinal mucosal hypermeability disorder, which is a disturbance in the production of digestive enzymes due to complex proteins that cannot be digested completely and turn into *peptides* that affect the nerves in the brain of ASD children and then cause reactive behavior.

The availability of *Modified Cassava Flour* (MOCAF) and Moringa leaves in Indonesia is quite abundant. Based on data compiled by Statistics Indonesia in 2018, data on the production of cassava or cassava in East Java reached 2,551,840 tons and is the third highest producer after Lampung and Central Java with a land area of 118,409.4 ha. In 2017, Statistics Indonesia collected data on the total area of moringa plantations in East Java covering 1,131,742 hectares of land located in Sumenep, Bangkalan, Banyuwangi and Bojonegoro. So, it can be concluded that the two plants are easy to find and process in Indonesia and their availability is abundant.

As one of the processed cassava/cassava products, MOCAF flour can be used as an alternative to gluten-free ingredients. According to Jaringan Pertanian Organik (Jaringan Pertanian Organik, 2019), MOCAF flour is a flour that is safe for children who have allergies to gluten (Jaringan

Pertanian Organik, 2019). However, until these days, MOCAF flour has not been used consistently as an application of GFCF therapy. In fact, MOCAF flour has the advantage of being a gluten-free carbohydrate source (Suwamba, 2008) and has better digestibility (Jaringan Pertanian Organik, 2019). Moringa leaves which are abundant in the community also have various advantages, one of the advantages of Moringa leaves contains Phenyl Isocyanate and Butyl Isocyanate which can inhibit the growth of the causes of intestinal mucosal hypermeability in children with autism (Bent et al., 2018).

The implementation of GFCF must be carried out consistently as a realization of the meaning of the five principles of Pancasila, Law No.8 of 2016, Presidential decree No. 39 of 2020 and so that the diet is not done from scratch again (Faradilla, 2018). Based on the results of research conducted by Gusti (Gusti, 2019) in SLB Laboratorium UM, it is known that there are several factors that cause inconsistency between parents in the application of the GFCF diet therapy, for instances: 1) the difficulty of finding substitutes for GFCF, 2) less economical alternative, and 3) types of food that are less varied. These three problems are getting worse in limited pandemic conditions. So, parents need food solutions that are ready to be processed but practical and can increase the creativity of cooking for parents at home.

Therefore, parents need a solution to the application of GFCF therapy that helps achieve consistency in the application of diet therapy. Products that apply the GFCF diet are still limited, even if there are some products, the prices are expensive and there is a lack of variation and it could make children bored (Gusti, 2019). Such as ladang lima flour, polo sagu, and biscuit glucafe cookies. The proposed Dream Pastry product is a solution product in the form of pastry dough and made from MOCAF flour and combined with Moringa leaves. Both of these ingredients can make it easier for parents to provide the GFCF diet therapy independently and periodically.

The concept of pastry dough business opportunities was developed based on Total Addressable Market (TAM) which is a customer in a core market who needs a product, Served Available Market (SAM) which is the customer share of the total TAM that can be reached and served, and Serviceable and Obtainable Market (SOM) which is the part of the TAM that we want to reach or occupy based on the potential of the product or service available. Therefore, Dream Pastry has the opportunity to become a viable business to develop. The purpose of this research is to analyze the business opportunity of Dream Pastry, which is a sheet-shaped puff pastry dough applying GFCF diet therapy. This puff pastry dough is in the shape of a sheet so that it is easy to make creation foods according to the autism children's favorites.

## II. Methods

This business development method consists of the concept of product development and business opportunity analysis.

### A. Product Concept Development

The development of Dream Pastry product design consists of MOCAF processing, Moringa flour manufacture, and puff pastry manufacture.

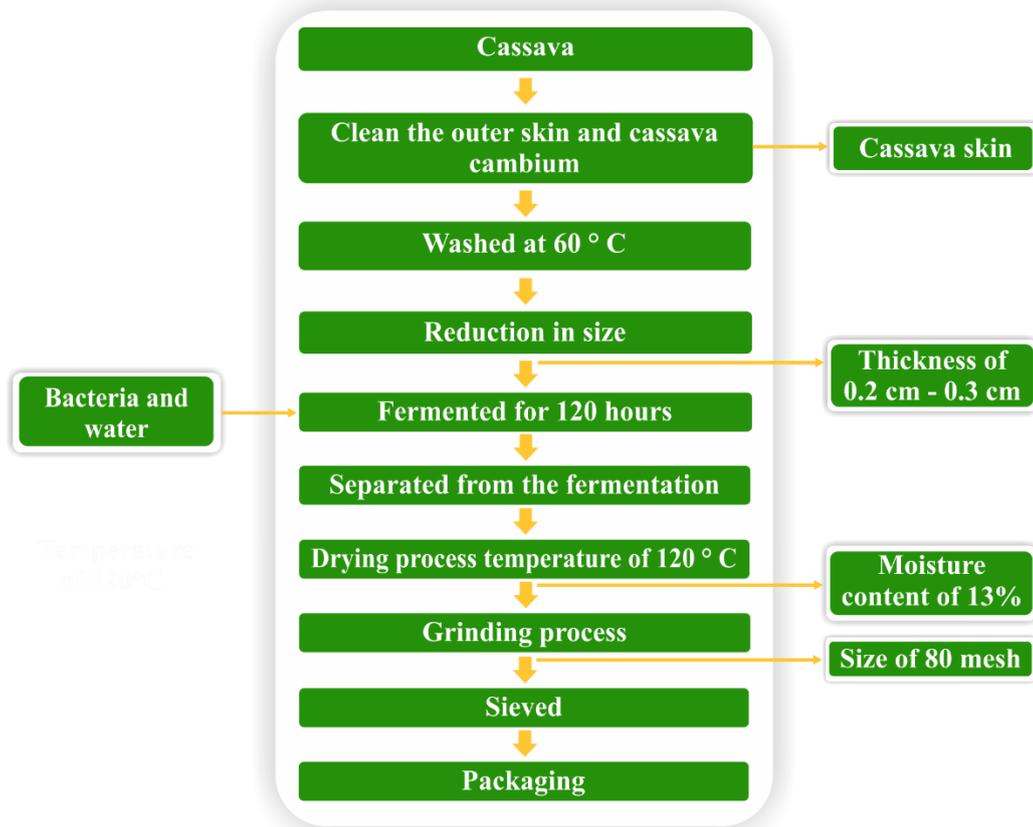


Fig. 1. MOCAF Making Process

### MOCAF Making Process

Starting with the selection of cassava that is ready to be processed into MOCAF, the next step is to clean the outer skin and cassava cambium. Cassava that has been peeled clean, then washed at 60 ° C to remove any remaining dirt. After that, it is cut with a thickness of 0.2 cm - 0.3 cm and then fermented for 120 hours. After the fermentation is complete, the cassava is separated from the fermentation precipitate and is continued in the drying process. Cassava drying is carried out at a temperature of 120 ° C with a moisture content of 13% in order to facilitate the grinding process. grinding was processed until the cassava pieces have a size of 80 mesh. The next step is sieving where the milled cassava is sieved to separate large grains that do not fit the size of the dam into MOCAF. The last is the packaging process where MOCAF is packed in airtight packaging to maintain the quality of MOCAF (Jatiningrum et al., 2019).

### Moringa Leaf Flour Making Process

The process of processing moringa leaves begins by cleaning the moringa leaves using clean water to remove the dirt that sticks to the moringa leaves. After washing, the Moringa leaves go through a blanching process at 70 ° C for 5 minutes, Then, the drying process or dehydrator is carried out at a temperature of 50 ° C for 90 minutes. This drying process aims to facilitate the steps to reduce the size of Moringa leaves. After reducing the size, it is then sieved to 80 mesh to form moringa grains. The final step is to sort the best grains to become Moringa leaf flour.

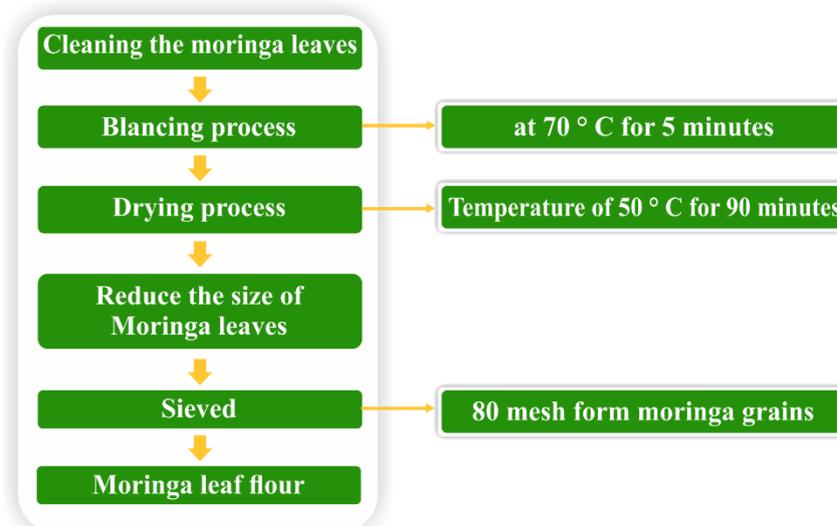


Fig. 2. Moringa Leaf Flour Making Process

### Puff Pastry Making Process

The first step in making puff pastry is mixing the weighted basic ingredients. Stir the ingredients until they become smooth, so that they are mixed perfectly. After that, the dough can be rested before adding fat. The added fat is used to layer the puff pastry and serves to expand the dough. The next step is to flatten the dough with a thickness of about 15 mm into sheets. The flattened dough then folded into a single fold. Then, the dough rested in the refrigerator for 15–20 minutes which aims to prevent the formation of the skin on the dough. After that, the dough is flattened again and then folds the dough into a double fold. Then, the dough is rested again for some time and then flattened with a size of about 15 mm. Finally, the dough is folded once again into a single fold before being left to stand for some time, then it ready to create with other foods.

### B. Business Opportunity Analysis

Pastry dough business opportunities are developed based on the following criteria:

1. Total Addressable Market (TAM) is a customer in a core market who needs a product.
2. Served Available Market (SAM) is the customer share of total SAM that can be reached and served.
3. Serviceable and Obtainable Market (SOM) is part of the SAM that wants to be reached or occupied based on the potential product or service available.

The market share of pastry dough in the midst of the pandemic has increased due to the shift in 30 new habits after the existence of Covid-19 (Yuswohadi et.al, 2020). One of this habit is the comeback of home cooking (Yuswohadi et.al, 2020). Therefore, people do a lot of activities in the house as well as the parents of ASD children. This new habit is in line with the business model that is being carried out, namely from downstream to upstream.

The Dream Pastry business concept also analyzed using Segmenting, Targeting and Positioning (STP), as seen in fig 3.



Fig. 3. STP analysis

The business plan to reach Dream Pastry's target market uses the best-selling 7 steps (fig. 4) direct open method created by Setiabudi (2013) i.e.: 1) target potential market, 2) products that make you miss, 3) the first taken package, 4) a popular brand, 5) distribution and promotion channels, 6) virus spreaders, and 7) conversion jump.

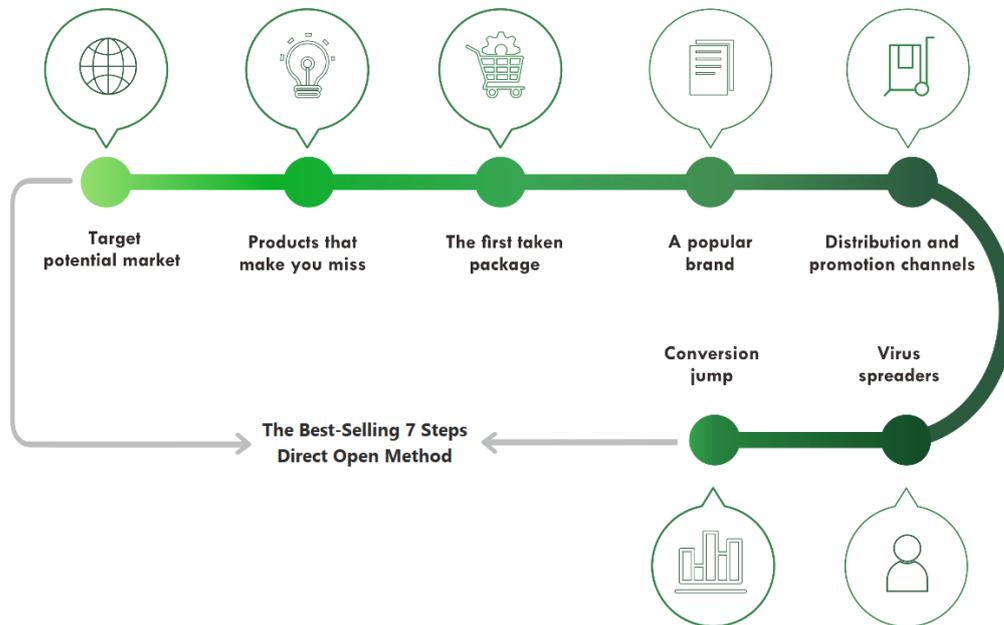


Fig. 4. The Best-Selling 7 Steps Direct Open Method

### III. Results and Discussion

#### A. Results

##### Dream Pastry's Concept

TAM from DREAM PASTRY is the number of autism students in Indonesia as many as 16,987. SAM from Dream Pastry is East Java Province with the number of autism students as many as 1999. SOM from Dream Pastry is 106 students with autism in East Java. This shows that Dream Pastry is very promising.

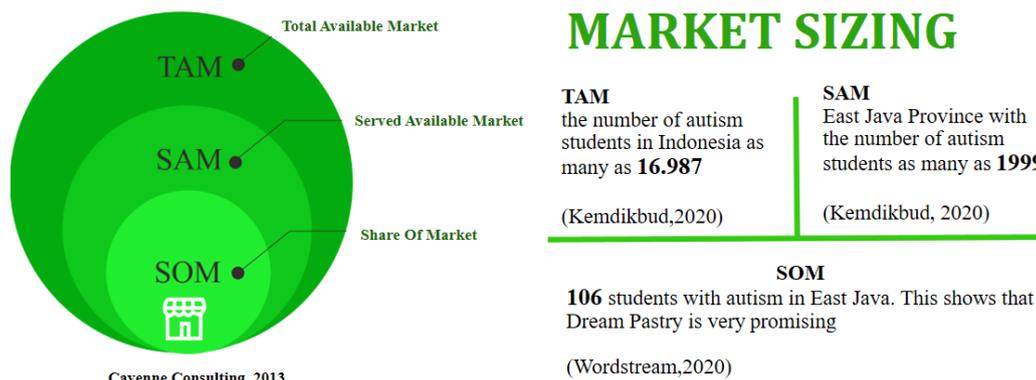


Fig. 5. Market Sizing

The design of the Dream Pastry product manufacturing process requires several raw materials such as MOCAF flour which has characteristics such as wheat flour, which is a source of gluten-free carbohydrates. (Jaringan Pertanian Organik, 2019), then add ice water to hydrate the flour (Lugito Wibisono, 2013) and maintain the temperature of the dough so that it becomes elastic (Fajar, 2015), To bind water and fat in the dough, eggs are added to add flavor, as a pantogen inhibitor that causes intestinal mucosal hypermeability in children with autism using 1-5% Moringa powder composition. (Kim & Lee, 2009), the last one is added with salt to stabilize the solidity of the dough, and the addition should not be above 3% because it reduces the elasticity of the dough, the last one is fat, fat

plays an important role in the manufacture of puff pastry dough because it provides crispness, softness, and enhances the characteristics of the dough. (Lugito, 2013).

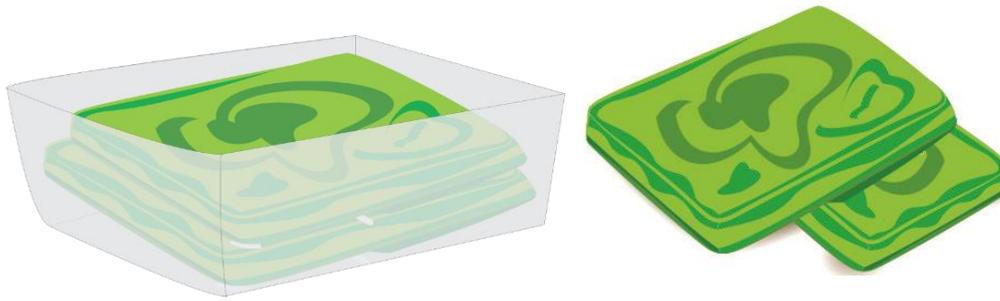


Fig. 6. Dream Pastry dough concept

Dream Pastry has a dominant packaging concept design in green as the color of moringa leaves, which is the basic ingredient for Dream Pastry. In addition to the features that are often owned by the packaging of a product, the Dream Pastry packaging design features QR code and children's motoric enhancement media. The QR code feature is useful in ordering products that make it easier for potential customers to get Dream Pastry products. Meanwhile, the media for improving children's motor skills comes from former Dream Pastry packaging.

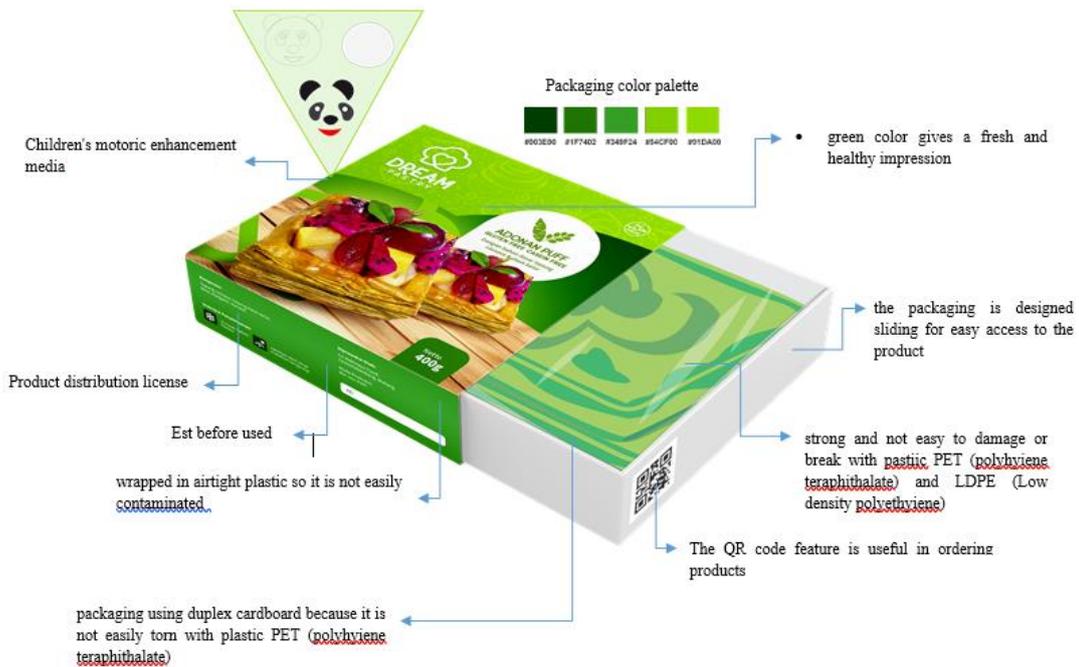


Fig 7. Dream Pastry packaging concept

Similar products circulating in the community for autism children nowadays tend to be in unprocessed ingredients such as flour or finished products in the form of pastries. When using a product in the form of flour, it takes longer in terms of processing, because it requires stages from preparation, processing, to finally the product is ready for consumption. If buying finished products such as cookies, it will be more practical, but in terms of limited product variety, children could get bored faster. Dream Pastry comes as a dough that is ready to be made as a solution for cutting the product processing process but can be made creatively.

Here are the results of the Dream Pastry analysis compared to similar products.

Indicator	Ladang Lima	Glukafe Cookies	Polo Sagu	Dream Pastry
Ingredient	Cassava	Soy Flour	Sago Flour And Coconut Milk	Mocaf And Moringa Powder
Product	Flour	Biscuits	Pastry	Puff Pastry Dough
Price	37,000 / kg	35,000 / 100 grams	70,000 / 180 grams	27,000 / 400 grams
Storability	1.5 Years	1 Month	1 Month	12 Months
Can Be Created	Yes	No	No	Yes
QR Code	No	No	No	Yes
Type Of Packaging	Cardboard And Plastic	Aluminum And Cardboard	Aluminium	cardboard and plastic
Other Functions	No	No	No	Children's Motoric Enhancement Media

Fig 8. Competitor

### Business Opportunity Analysis

The canvas business model and the concept from downstream to upstream, so this business focuses on creating ready-to-process raw products. The marketing concept is by conducting intensive promotions both offline and online to expand the market reach of Dream Pastry. One of the value propositions of Dream Pastry is used cardboard packaging which could be a medium for improving children's motor skills. This is because the former cardboard packaging can support cutting, pasting, and/or coloring activities. The images on the packaging are also colorful so they are attractive and don't bore children.

Dream Pastry also has the opportunity to become a market leader for products for children with autism. Based on the STP analysis above, it is known that the segmenting of Dream Pastry is children with autism spectrum. The targeting of this business concept is as follows: 1) parents of children with the autism spectrum, and 2) The initial market niche was ASD East Java Province children totaling 1,999 children. The positioning of the Dream Pastry concept is as the first gluten-free and casein-free puff pastry dough with the tagline "*Lebih banyak kreasinya, lebih bahagia anaknya*" or "The more creations, the happier the children".

This business can be developed more broadly to become CV Abhinaya Food which has facilities for consulting services, child allergy tests, cooking classes, and comprehensive therapy. It is also possible to sell more attractive packages to consumers to double business revenue. So that with this business strategy, Dream Pastry can become an industrial scale company. The canvas business model is used as a tool in management strategy to translate concepts, customers, infrastructure, and company finances in the form of visual elements. The right business model and strategy will bring Dream Pastry's business to an increase of up to 20% every month.

### B. Discussion

#### Financial Aspect

The following below is an illustration of the feasibility of Dream Pastry production which has been projected for three months. There were 385 product units that had been sold during the three months. The production of the product requires a working capital of Indonesian Rupiah (IDR): IDR 5,000,000.00 Here are the calculation results:

Average Cost Per box	: IDR12,987.00
BEP Output	: 185 boxes.
Selling Price	: IDR 27,000.00

Benefit Cost Ratio	: 2.08.
Payback Period	: 2.7 months.
Return on Investment	: 107.9%
Margin	: 52%

Profits for 3 months of production are predicted to be IDR 5,395,000.00

Based on the results of the above calculations, it shows that Dream Pastry is feasible to be developed.

#### Product, Price, Location, and Marketing Aspects

The advantages of the Dream Pastry concept compared to similar competitors are as follows: 1) using MOCAF flour which is gluten-free and contains more soluble fiber than cassava flour and has a much better digestibility (Jaringan Pertanian Organik, 2019), 2) There is a combination of Moringa oleifera leaves which is a natural dye (Kim & Lee, 2009) and has the content to reduce the *C. prefringens* bacteria present in the digestion of ASD children (Bent et al., 2018), 3) can enhance the GFCF diet menu processing creation of parents at home, 4) ex-packaging can be a medium for improving children's motor skills (Widayati, Adhe, Nafisa, & Silvia, 2019), also 5) be able to last up to 12 months (Mardiah, Trsinawati, & Surjoseputro, 2017), economical and practical.

One Dream Pastry package contains three dough stacks with a total weight of 400 grams. The selling price is IDR 27,000.00 which is under market price as a strategy for competing consumers to switch to Dream Pastry products. Location of business production in the center of Malang City which makes it easier to fulfill production needs. Malang is the second largest city in East Java which has the second highest number of children with autism in Indonesia. Promotions that will be used take the advantage of marketplaces, websites, and social media to introduce products and increase sales activities. The development of the Dream Pastry business concept consists of financial and business designs.

1. The financial plan in this business includes an income statement, a report on changes in capital, a financial report, and a cash flow statement.
2. Based on the 7 best-selling direct open formulas at Dream Pastry, there are 7 steps to starting this business as follows: 1) The potential market is obtained from reading the existing opportunities, namely targeting East Java province as a niche market, which is the second highest province with autism children. 2) products that make you miss, with the value of the product, such as a recipe, easy to process. 3) the first taken package, the packaging is attractively designed according to the characteristics of children with autism, there is plastic as a container so that the dough is not easily damaged and contaminated, sliding cardboard packaging to make it easier to pick up products, when the dough runs out, the ex-cartons can be used as a medium for improving children's motor skills. 4) Dream Pastry has a philosophy with the presence of this product in the market, able to answer the dreams of parents who crave practical, ready-to-process products by applying the GFCF diet. 5) the use of social media as a product catalog, a market for online marketing, while for offline consignment with supermarkets and Special school. 6) collaborate with the autism caring community to increase sales activity, and 7) sells attractive package packages and pricing strategies for the conversion jump.

#### Conclusion

Dream Pastry is a puff pastry dough concept made from MOCAF flour and Moringa leaves. MOCAF flour is a source of carbohydrates with characteristics such as wheat flour, combined with Moringa powder which functions to inhibit bacteria that cause intestinal mucosal hypermeability in children with autism. Using a downstream to upstream business model, this business focuses on creating ready-to-process products. The business plan to reach the target market uses 7 best-selling direct open formulas, i.e.: 1) target potential market, 2) products that make you miss, 3) the first taken package, 4) a popular brand, 5) distribution and promotion channels, 6) virus spreaders, and 7) conversion jump. The initial target market niche is East Java province which is the second highest province in Indonesia which has 1999 children with autism. Dream Pastry can be a solution to parental inconsistency in applying gluten-free and casein-free diets for children with the autistic

spectrum. The existence of this concept is also capable of being a promising business opportunity and worthy of being developed.

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