Brassica box food products as a healthy local food innovation in The Covid-19 pandemic period

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Abstract. The Covid-19 pandemic is now becoming a fear of the people. Food products and unhealthy eating patterns bring problems for health. It brings two main issues, namely the impact produced by coronaviruses for health and the effect produced by-products and eating habits that are not good for health. Therefore, the authors innovate by developing Brassica Box food products, which are food products made from cauliflower that are healthy, delicious, attractive, and straightforward. At the very least, this food product can be an alternative healthy food product in the Covid-19 pandemic. This paper will discuss how Brassica Box can be an alternative to healthy food in the Covid-19 epidemic and can be an entrepreneurial opportunity. Through entrepreneurship courses, students learn the methodology of entrepreneurship along with Brassica Box product development itself through manufacturing procedures, costs, and design innovation of Brassica Box products. The method used is the organoleptic test and Focus group Discussion with data analysis of each indicator with a Likert Scale. By conducting experimental research in class, it is proven that Brassica Box is a food product that has a good texture, aroma, and taste, and is also healthy for consumption.

1. Introduction

During the Covid-19 pandemic, healthy food became the main thing, especially for people with congenital diseases. Based on research conducted on 1527 patients in China, the results of the analysis showed that the highest Covid-19 comorbidities were hypertension (17.1%, 95% CI 9.9–24.4%), cardia-cerebrovascular disease (16.4%, 95% CI 6.6–26.1%), and diabetes (9.7%, 95% CI 6.9–12.5%) [1]. There is no definitive data source that states that the disease affects transmission to Covid-19. However, based on a study of 1099 co-19 patients in 552 hospitals in China, it was proven that the number of sufferers with severe conditions was more dominant towards patients who had congenital diseases (the ratio was between 38.7% and 21.0%) [2]. It shows that Covid-19 sufferers with congenital disorders (such as hypertension, cardia-cerebrovascular disease, and diabetes) have a high risk of making their condition worse.

It shows the importance of healthy food during the Covid-19 pandemic. One of the primary foods of humans is rice. Half of the world’s population consumes rice, as do 90% of people in Asia [3]. However, as a result of consuming excessive rice can cause obesity. Meanwhile, according to the British Medical Journal, obesity can increase the risk of developing type 2 diabetes, heart disease, and even death [4]. Therefore, the author decides to innovate food products by replacing rice staples. The author chose to replace it with vegetable ingredients.
Vegetables play a significant role in the human body, individually as a source of phytonutriceuticals, vitamins (C, A, B1, B6, B9, E), minerals, dietary fiber, and phytochemicals. All types of vegetables also have the same function offered, namely, to prevent chronic diseases [5]. It can be said that there will be no loss if we consume vegetables, of course, with adequate portions.

One vegetable that has a variety of benefits is cauliflower. Cauliflower is a type of vegetable with the Brassicaceae family, which is a type of cabbage with white flowers [6]. Cauliflower or in Latin Brassica oleracea L. has some complete nutrients, namely 4 mM KNO3, 4 mM Ca(NO3)2, 2 mM MgSO4, 1.33 mM NaH2PO4, 100 mM Fe EDTA, 10 mM MnSO4, 30 mM H3BO3, 1 mM mM CuSO4, 1 mM ZnSO4, 0.2 M Na2MoO4, 0.1 mM CoSO4, 0.1 mM NiSO4 and 0.1 mM NaCl [7]. Health cauliflower has various advantages, such as overcoming digestive disorders, preventing the effects of ultraviolet radiation, diabetes, inflammation of the intestine, macular degeneration, obesity, and hypertension [8]. It shows that cauliflower is an excellent ingredient as a substitute for rice during the Covid-19 pandemic. Based on the benefits of cauliflower vegetables, the authors decided to create different healthy food products using the basic ingredients of cauliflower. This healthy food product the author named "Brassica Box," which was inspired by the Latin name cauliflower and fast food product "Rice Box." The author assumes that this healthy food product can be an alternative substitute for food products made from raw rice and can also be a healthy food choice.

Brassica Box uses cauliflower instead of rice. Rice provides energy, protein, and iron of 63.1%, 37.3%, and 25-30% of the total needs of the body and also contains glucose, which is essential for the body [9]. However, excess glucose can also cause obesity, diabetes, and other diseases. Brassica Box products combine cauliflower as the main ingredient with corn, as well as other components. Corn also contains carbohydrates, which are almost the same as rice, 76.2% [9]. The sweet taste of corn is also a consideration in the selection of ingredients. Besides cauliflower (as the main ingredient) and corn (as supporting material), Brassica Box also combines carrots and chicken as other supporting materials. Carrots contain provitamin A useful for vision, growth, and development [10]. While the chicken itself adds protein content, these supporting materials further enhance the value and quality of Brassica Box food products, especially in terms of health. The formulation of the problem for this paper is how to make Brassica Box as healthy local food and organoleptic test results of the product as well as the entrepreneurial potential for Brassica Box’s healthy food product innovation?

2. Research Method

2.1. Product manufacturing procedure

The main ingredients are cauliflower, while the supporting components include corn, carrots, chicken meat, and other seasonings (without flavoring). All of these ingredients are processed into Brassica Box food products.

2.2. Research data analysis

The study used qualitative research using several respondents for trials using the taste buds. The results of the assessment were converted into numbers and processed with a Likert measurement scale [11]. Research conducted involved 13 respondents. All panelists are students of Jaffray Makassar School of Philosophy who take Entrepreneurship courses, including lecturers supporting Entrepreneurship courses.

The research procedure starts with the processing and manufacturing of existing materials. The manufacturing process is based on Brassica Box food product group presentations that have been done before. After that, an organoleptic test/acceptance test is carried out. Next, organoleptic test results are discussed using the Focus Group Discussion method [12].

In testing food products, the respondents entirely rely on their sense devices. For example, using the nose to judge scents, using the tongue to judge taste, etc. Assessments produced in organoleptic tests are also assessments based on panelist assumptions. The Focus Groups Discussion method is a method used to obtain data quickly and efficiently [12]. The research method helps researchers receive
different responses from different ways of interacting [12]. Therefore, it can be obtained various data and answers related to Brassica Box food products.

After conducting organoleptic tests and Focus Groups Discussion, an evaluation was carried out. An assessment is carried out to discuss the shortcomings of food products. Then the failures of the product must be revised so that the results of the product are better. After that, a discussion about the product design will be produced, and finally, the final product is finished.

![Diagram](image)

**Figure 1.** Procedure for making brassica boxes until the final product.

### 3. Result and Discussion

#### 3.1. Organoleptic test results

The organoleptic test is divided into 2, namely the hedonic test and hedonic quality test [13]. Correctly, for Brassica Box food product testing, hedonic testing is used. The panelists were asked what they thought of the product they were given. Panelists’ opinions are related to the likes or dislikes of the product, and the level of likes or dislikes. The hedonic scale associated with the level of likes ranged from very liked to intensely disliked. The given size is represented by a number ranging from 1 to 5.

1 = Very disliked  
2 = Dislikes  
3 = Enough  
4 = like  
5 = like it

The parameters that determine the rating include aroma, texture, taste, and overall product. Results from organoleptic testing are shown in table 1.

![Table](image)

**Table 1.** Organoleptic test assessment.

| Panelist | Aroma | Texture | Taste | Overall product |
|----------|-------|---------|-------|-----------------|
| 1        | 5     | 4       | 4     | 4               |
| 2        | 5     | 4       | 4     | 4               |
| 3        | 5     | 4       | 5     | 5               |
| 4        | 3     | 5       | 4     | 4               |
| 5        | 4     | 4       | 5     | 4               |
| 6        | 3     | 3       | 3     | 3               |
| 7        | 4     | 4       | 4     | 4               |
| 8        | 5     | 4       | 5     | 4               |
| 9        | 5     | 4       | 4     | 4               |
| 10       | 4     | 4       | 4     | 4               |
| 11       | 4     | 4       | 4     | 4               |
| 12       | 3     | 4       | 4     | 4               |
| 13       | 3     | 4       | 4     | 4               |

The assessment in terms of aroma, there are five panelists (38.46%) who like it, four panelists (30.77%) who like it very much, and four panelists (30.77%) who like the aroma of the product. There were no panelists who gave terrible ratings because of the fragrant and distinctive aroma of the product. Based on panelist ratings, the most dominant scent is the aroma of the cauliflower itself and its spices.
The assessment in terms of texture, there is one panelist (7.69%) who likes, 11 panelists (84.62%) who like, and one panelist (7.69%) who likes the texture of the product. No panelists gave a bad rating because the surface of the product was not too soft and not too hard, especially the texture of the cauliflower that resembled rice. The water content of cauliflower that is not too much to make the texture is not soft.

In terms of taste, there were three panelists (23.07%) who liked it, nine panelists (69.23%) who liked it very much, one panelist (7.69%) who liked the taste of the product. There were no panelists who gave poor ratings because of the diverse, unified, and fitting taste of the product. The cauliflower’s flavor is not tasteless, and corn, which offers a sweet taste, influences judgment. Panelists also considered the advantages of products that did not use artificial flavoring.

Rating of the whole product, there are one panelist (7.69%) who like 11 panelists (84.62%) who like, and one panelist (7.69%) who likes the whole of the product. Panelists concluded based on the aroma, texture, and taste of the product.

Through Focus Groups Discussion, panelists provide feedback on what needs to be further developed. Based on the results of the discussion, many things need to be evaluated: cuts from each vegetable that are less consistent (some are large, and some are small) and flour from chicken that is not crispy.

| Table 2. Brassica box product Likert scale test. |
|-----------------------------------------------|
| Assessment         | Likert scale (%) |
| Aroma              | 81.53            |
| Texture            | 80               |
| Taste              | 83.07            |
| Overall product    | 80               |

The results of the Brassica Box Likert scale product assessment in a row to assess the aroma, texture, taste, and overall product are 81.53%; 80%; 83.07%; 80%. The overall Likert scale results show that Brassica Box products are closer to the “like” rating by panelists who are tested on a limited basis. Brassica Box products in financing also require capital that is not large and can be implemented at home as a small business [14].

3.2. Initial capital costs
In subsequent calculations, the Supporting Tools will not be returned, because they do not need to be repurchased or can be used again.
Table 3. Types of supporting tools and prices.

| Types of Tool     | Prices (IDR) |
|------------------|--------------|
| Wajan Aluminium  | 24,000       |
| Kompor Gas       | 75,000       |
| Tabung Gas 3 Kg* | 135,000      |
| Sutil            | 5,000        |
| **Total**        | **239,000**  |

*Can be used repeatedly, at least ten stages of the use process again.

Table 4. Consumables.

| Material Name              | Prices (IDR) |
|----------------------------|--------------|
| Cauliflower 1.5 Kg         | 30,000       |
| Corn 2 pcs                 | 4,000        |
| Carrot                     | 5,000        |
| Bombay Onions 1 pcs        | 2,000        |
| Leek                       | 2,000        |
| Blue Band 250 gr*          | 13,300       |
| Maizena 150 gr*            | 4,000        |
| Wheat Flour ½ Kg*          | 5,000        |
| Salt*                      | 3,000        |
| Chicken breast*            | 20,000       |
| Pepper 3 pcs*              | 3,000        |
| **Total**                  | **109,300**  |

* There is still leftover and can be reused, at least ten more stages of the cooking process.

Table 5. Product Design Costs

| Name                        | Prices (IDR) |
|-----------------------------|--------------|
| Food pail S size 10 pcs     | 9,000        |
| 10pcs plastic spoon         | 2,000        |
| Ten pcs stickers            | 10,000       |
| 10 pcs plastic              | 3,000        |
| **Total**                   | **24,000**   |

3.3. Calculation of Long Scale Product Benefits

The initial capital needed is 372,000 IDR, while the products produced from the above ingredients are 10 Brassica Box products.

So, 10 x 25,000 IDR = 250,000 IDR.

When viewed from the initial capital, there is a loss, because the supporting equipment is included. If you look at the 10-scale length of making, in the sense of 100 products produced, the calculation is like this:

Initial earnings:

Benefits - initial capital (including supporting tools)
250,000 IDR - 372,000 IDR = minus 122,000 IDR.

Supporting tools do not count anymore because they can be used repeatedly, as well as consumables marked with *. That is, to make ten more Brassica Boxes, consumables such as cauliflower 1.5 kg are needed; corn 2 pcs; carrot; 1pcs onion; leeks with a total price of 43,000 IDR.
The benefit gained was 250,000 IDR, can buy 5 times the material needed, meaning you can make 50 Brassica Boxes, with the calculation:

\[
\frac{250,000 \text{ IDR}}{43,000 \text{ IDR}} = 5 \text{ times the material, with the remaining 35,000 IDR (labor wage costs)}
\]

This means that the benefits in the second stage are:

\[
(50 \text{ Brassica Boxes } \times 25,000 \text{ IDR}) - (\text{initial loss + capital to make 50 more Brassica Boxes}) = (50 \times 25,000 \text{ IDR}) - (122,000 \text{ IDR} + (43,000 \text{ IDR} \times 5)) = 1,250,000 \text{ IDR} - 337,000 \text{ IDR} = 913,000 \text{ IDR (second phase profit)}
\]

Marketing Brassica Box products can be marketed through social media and sales applications, and transportation. During the Covid-19 pandemic, many customers made online transactions and reduced food purchases directly to fast food vendors. This opportunity is shifting social change from offline to a new era online [15]. Everyone now has access to become entrepreneurs and market their products online, such as Brassica Box, as local fast food.

3.4. Brassica box products as green agriculture products
Vegetable cauliflower as an essential ingredient in making Brassica Box. As an alternative to rice as food for the majority of Indonesia's population. From now on, people need to change their mindset to see life as an entrepreneurial opportunity [16] by promoting environmental values [17]. Healthy living, healthy food, and a healthy environment can be sourced from green agriculture. Gardening in urban areas can support the availability of food for urban food security [18]. Cauliflower is one of the vegetables that can be planted in the yard and utilizes vacant land to grow vegetables in the pandemic period Covid-19. Healthy food is not always expensive. It becomes costly because people are used to buying food outside and not managing themselves. Brassica Box products support Go Green as part of environmental education [19,20]. Aside from Go Green as an Indonesian government program and the world’s call to tackle global warming. The green environment has a health impact on humans in enjoying God’s creation. The values of environmental care are the philosophical foundation of Brassica Box as a healthy food.

3.5. HACCP Brassica Box Products as Healthy Local Food
Manufacturing Brassica Box products must meet the Hazard Analysis and Critical Control Points (HACCP) to ensure food safety in food processing recommended by the International Commission on Microbiological Specifications for Foods and Codex Alimentarius Commission [21,22]. The critical point of Brassica Box products is found in all the necessary ingredients starting from the garden where vegetables are planted. Thus, cabbage vegetables need to be cultivated organically and free from disease by meeting food safety standards for healthy food [22]. The processing method is the next critical point, for example, supporting equipment which is always clean and hygienic, the processing environment is always kept clean, and the last part is the packaging process, the product's shelf life. In this case, the management of the HACCP from the farm to the process, and it ends with the customer has a strict HACCP standard [23] even though Brassica Box is a small business that has just been built. The goal is that every healthy food product is not only labeled but proven until the customer consumes it and remains healthy.

Socio-economic changes during the Covid-19 pandemic [24] requires that human life be more disciplined in terms of environmental and self-health, and have sufficient information to carry out the Health protocol recommended by the Indonesian government. One of them is consuming nutritious food whose processing is clean and cares for the clean environment. As a food maker in its handling and packaging also pay attention to the cleanliness of food so that it does not become a source of other diseases [25].

4. Conclusions
Brassica Box products are local food innovations made from cabbage flower vegetable ingredients. Healthy food that is processed with natural flavoring ingredients that promote environmental values. The
aspects of entrepreneurship education and food technology innovation result in organoleptic test results favored by panelists. During the pandemic, Covid-19 became an alternative healthy food that could be processed at home and became a small business to improve the entrepreneurial spirit and family economy.

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