

The Role of Mineral Content in Bamboo Shell Meat (Shell Meal) and Calm Flour (Meat Meal) and Formation Process on the Health of Living-Being in Indonesia

Ninis Trisyani

Faculty of Engineering and Marine Science, Department of Fisheries, Universitas Hang Tuah, Surabaya, Indonesia
Email: nisuht@yahoo.com

The health of living organisms on Earth is crucial to their survival, and the efficient utilization of minerals is the most effective answer to this phenomenon; therefore, researchers must focus on this issue. Consequently, the current study explores the effect of the mineral content of bamboo shell meat flour and bamboo shell calm flour on the health of living organisms in Indonesia. The article also examines the moderating effect of the formation process on the relationship between the mineral content of bamboo shell meat flour, bamboo shell calm flour, and the health of living organisms in Indonesia. Using questionnaires, the researchers have collected primary data from selected respondents. The researchers have also utilized smart-PLS to examine the relationship and test the study's hypotheses. The results revealed a beneficial relationship between the mineral content of bamboo shell meat flour and bamboo shell calm flour and the health of living organisms in Indonesia. The results also suggested that the creation process moderates the relationship between the mineral content of bamboo shell meat flour, the mineral content of bamboo shell calm flour, and the health of living organisms in Indonesia. This article aids policymakers in developing legislation concerning the proper use of the mineral in daily life and which wheat is healthier for living organisms.

Key words: Mineral content in bamboo shell, meat flour, calm flour, the health of living being.

1. INTRODUCTION

Bamboo shell (*Solen* sp.) is one type of shellfish that has commercial value and is cultivated as a source of protein and minerals to suit the Indonesian population's dietary requirements. Bamboo shells inhabit intertidal zones on sandy and clay substrates impacted by tides and have tunnels in the substrate (Trisyani, 2018; Trisyani & Yusan, 2020). In Indonesia, bamboo shell are found in Pamekasan, Bangkalan, Surabaya, Cirebon and Jambi under numerous regional names, namely knife shell, "Lorjuk" and "Sumbun" (Liang et al., 2018; Trisyani, 2018). A bamboo shell has a two-piece, fragile, elongated shell with an upright posterior side and a slightly downward-tilted anterior side. The shell's length ranges from 2.5 to 6.4 centimeters. *Solen* sp. comprises 76.09 percent protein, 0.49 percent fat, 4.81 percent carbs, 9.49 percent water, and 3.99 percent ash. Shell flour from *Solen* sp. includes 2.92 percent protein, 0.31 percent fat, 1.17 percent carbohydrates, 0.57 percent water, and 95.04 percent ash (Trisyani & Anggorowati, 2020). A marine bivalve's composition offers a nutritional guarantee for millions of starving individuals (Zhou et al., 2020).

In addition to carbs, lipids, proteins, and vitamins, the body also needs minerals as a sort of nutrition (Lee et al., 2019). Minerals are essential in maintaining biological functioning at the cellular, tissue, organ, and overall body levels. Minerals also function in several stages of metabolism, particularly as enzyme cofactors. Mineral deficiency can lead to anemia, goiter, osteoporosis, and

osteomalacia, among other health issues. Additionally, mineral insufficiency impacts metabolism and tissue structure (Ratna & Trijoko, 2019). Mineral requirements can be met by ingesting food from plants (vegetable minerals) and animals (animal minerals). Macro minerals such as calcium and phosphorus act in the creation of bones and teeth, sodium functions in helping to maintain osmotic pressure and acid-base balance, and the existence of other macro minerals are essential to the body. Microminerals like zinc play a crucial role in oxygen transfer to hemoglobin tissue and cellular oxidation pathways (Xia et al., 2018).

Widespread usage of shell waste as a mineral source has occurred. The high calcium carbonate content of shellfish can be utilized in pharmaceutical formulations and construction; *Crassostrea madrasensis* shell flour can be utilized efficiently in the pharmaceutical, fertilizer, lime, cement, and animal feed sectors. Jia et al. (2019) use blood clam meal as a calcium source in catfish feed. Moreover, Premawansa, de Souza et al. (2021) reported that chemical analysis of oyster shells revealed that the bioavailability of calcium from oyster shells is greater than calcium salts used in allopathic medicine and that the essential elements for health are Calcium, Magnesium, and Sodium. Calcium carbonate makes up the mollusk skeleton. A tiny fraction of the bivalve shell structure consists of phosphate. Calcium carbonate makes up the majority of the bivalve shell. Thirty-seven percent of the bivalve shell was composed of calcium. The shells of

bivalves have a higher calcium concentration than fish bone meal.

Numerous minerals are present in bamboo shell flour, including macro minerals such as Calcium (Ca), Phosphorus (P), Magnesium (Mg), Sodium (Na), and Potassium (K), and micro minerals such as Zinc (Zn), Selenium (Se), Iron (Fe), etc. As the mineral content has numerous benefits, such as food consumption and health protection, its primary application is in medicinal formulations and the pharmaceutical business. In the Indonesian pharmaceutical industry, numerous experiments have been conducted to generate mineral contents from various types of shellfish, such as bamboo shells, which already possess the capacity for general minerals; this capacity of shellfish depends on the water, sandy, dusty, and clay substrates (Karaulova, Yakush, Slutskaya, & Shulgina, 2021). The pharmaceutical or medicinal sector uses bamboo shells typically harvested in Pamekasan, Bangkalan, Surabaya, Cirebon, Jambi, etc., to create food items (Trisyani & Anggorowati, 2020) or mineral-containing medicines. First, the bamboo shell meat or bamboo shell clam is subjected to a specific mechanical or chemical process in which they are boiled, cooked, and treated with various chemicals or minerals, transforming into flour. Second, this flour is modified and used to create a variety of food and pharmaceutical goods (Duan et al., 2017).

Though the experiment of turning bamboo shell meat or bamboo shell clams into flour containing various minerals vital to life has already been conducted, it is currently being used to create mineral-based foods and medicines. Still, many pharmaceutical companies are either unaware of the significance of bamboo shell meat flour or bamboo shell clam flour, their mineral-providing ability, and their effects on human health, or they are unable to benefit from it (Lin, Shi, Mu, Chen, & Luo, 2018). And in Indonesia, many individuals of all ages and different forms of life are afflicted with health conditions due to the minerals in their bodies. Therefore, pharmaceutical industry experts must be adequately informed about the health benefits of bamboo shell meat and bamboo shell clam flour. In light of this necessity, the current study aims to achieve the following:

- To investigate the impacts of the mineral content in bamboo clam meat flour on the health of living beings.
- To investigate the impacts of the mineral content in bamboo shell clam flour on the health of living beings.
- To investigate the moderating role of the formation process between mineral content in bamboo clam meat flour and the health of living beings.
- To investigate the moderating role of the formation process between mineral content in bamboo shell clam flour and the health of living beings.

Although numerous research on the ash content analysis of food products and seafood have been undertaken, this work is an outlier and a significant contribution to the field.

In the past, only the formation of bamboo shell flour and the mineral content analyses have typically been addressed. This study examines the relationship between bamboo shell flour and its mineral content and the health of living organisms. Second, many prior studies focused primarily on bamboo shells' mineral makeup and health benefits. This study examines the impact of mineral content in bamboo shell meat flour and mineral content in bamboo shell clam flour on the health of different organisms, thus filling a gap in the existing literature. Thirdly, the formation process as a moderator between the mineral content of bamboo shell meat flour and bamboo shell clam flour and the health of living organisms is also an essential contribution to the literature. The analysis of ash content is not novel in Indonesia, but this is the first time that the effects of mineral content in bamboo shell meat flour and mineral content in bamboo shell clam flour on the health of living organisms have been studied in Indonesia.

The remainder of the paper consists of the following sections: The second section is a literature review about the effects of mineral content in bamboo shell meat flour and mineral content in bamboo shell clam flour on the health of living organisms. The third section outlines the data collecting and analysis methods used to determine the link between the components. The outcomes of the investigation are then supported by prior research. It concludes with study implications, limits, and study conclusions

2. Literature Review

Humans and other living beings, such as animals and birds, must be healthy because only healthy individuals can produce healthy human resources. Only healthy animals and birds can give an economy raw materials, food, and services. Therefore, the health of living things is essential to a nation's economic development and social welfare. In addition to nutrients such as carbohydrates, lipids, proteins, vitamins, etc., minerals such as Calcium, Magnesium, Phosphorus, Sodium, Potassium, Iron, Zinc, Selenium, etc., play an essential role in supporting human health. The minerals required by living organisms include macro minerals such as Calcium, Phosphorus, Magnesium, Sodium, and Potassium, and micro minerals such as Zinc, Selenium, Iron, etc. The raw bamboo shell contains nutrients and minerals, although in modest quantities (Jingyuan et al., 2020).

In contrast, the mineral content of bamboo shell meat flour and bamboo shell clam flour is significantly higher. Whether consumed as food or administered as medicine, they preserve the health and function of living organisms. The amount of minerals in bamboo shell meat flour and bamboo shell clam flour is dependent on the method used to produce the flour from bamboo shell meat and bamboo clam. The number of minerals determines the health of users of these two varieties of flour made from any sort of bamboo shell. Minerals in more significant quantities may benefit healthy organisms (Fujita et al., 2019). This study

investigates the effects of mineral content in bamboo shell meat flour and mineral content in bamboo shell clam flour on the health of living organisms and the function of formation processes between these mineral contents and the health of living organisms. Existing literature addresses the connection between the creation process, the mineral content of bamboo shell meat flour and bamboo shell clam flour, and the health of living organisms. Various authors have offered divergent perspectives on the link between these perspectives. This article examines the relationship between the creation process, the mineral content of bamboo shell meat flour, bamboo shell clam flour, and the health of living organisms in light of previous writers' perspectives.

In a scholarly article, [de Souza et al. \(2021\)](#) discussed the features of the bamboo shell and the examination of ash content in bamboo shell meat and bamboo shell flour. In addition to other nutrients, bamboo shell meat contains trace amounts of minerals, according to the report. But the mineral content of bamboo shell meat flour is more significant. Both the minerals required in large quantities by living organisms and the minerals required in lower amounts can be extracted in the desired quantities from bamboo shell meat flour. Using products containing bamboo shell meat flour makes it possible to preserve the health of living organisms, and the mineral content of bamboo shell meat flour has a positive correlation with the health of living organisms. Calcium, phosphorus, magnesium, sodium, and other minerals can be found in bamboo shell meat flour, according to [Db, Hart, and Nyeche \(2017\)](#). These minerals sustain the body's health and function, including cell, tissue, and organ function, as well as the body's overall health. Therefore, bamboo shell meat flour in the form of food or medicine contributes to maintaining a healthy body and mind. [Ilyas, Zia, Rehman, Ilyas, and Sultana \(2021\)](#) investigate the mineral content of bamboo shell meat flour and its effect on the health of living organisms. This study demonstrates that bamboo shell meat flour is rich in calcium and phosphorus. Calcium aids in the formation and repair of tissues, muscles, and other organs such as bones and teeth. However, calcium without phosphorus can damage the body and impair cognitive function. Therefore, bamboo shell meat flour, rich in calcium and phosphorus, is healthier for living organisms. Therefore, the following can be hypothesized:

H1: Mineral content in bamboo shell meat flour positively impacts the health of living beings.

The research conducted by [Pleadin et al. \(2019\)](#) explores the characteristics and mineral content of bamboo shell meat flour. The bamboo shell meat contains elements such as carbs, lipids, proteins, and vitamins that are also found in other foods, as well as trace amounts of minerals. However, bamboo shell clam flour includes considerable amounts of minerals such as calcium, potassium, phosphorus, salt, magnesium, iron, zinc, chromium, copper, fluoride, and selenium. These minerals from

products containing bamboo shell clam flour assist consumers in overcoming health issues such as anemia, goiter, osteomalacia, and osteoporosis and preserve the health of living things. Therefore, the mineral content of bamboo shell clam flour benefits the health of living organisms. [Kiin-Kabari and Obasi \(2020\)](#) investigate the connection between the mineral content of bamboo shell meat flour and the health of living organisms. When bamboo shell clam flour undergoes a scientific process, it produces a significant amount of macro minerals such as calcium, magnesium, phosphorus, and sodium. These minerals are essential for maintaining body structures such as bone, cartilage, and exoskeleton and regulating blood circulation, cholesterol, and acid-base balance. Therefore, the mineral content of bamboo shell clam flour contributes to maintaining bodily health. The essay by [Lawal-Are, Moruf, Ojeh, Taiwo, and Aligbe \(2021\)](#) discusses the ability of bamboo shell clam flour to generate nutrients and safeguard human health. According to this study, bamboo shell clams flour contains an acceptable salt level. Proper sodium levels in the body maintain acid-base equilibrium, neuronal transmission, glucose absorption, muscular contraction, and membrane transfer of numerous nutrients. Therefore, the mineral content of bamboo shell meat flour enhances and sustains the health of living organisms.

Similarly, [Araújo, Lima, Cardoso, and Pasa \(2020\)](#) work sheds light on the role of mineral content in bamboo shell clam flour in enhancing and preserving the health of living organisms. Anemia, goiter, osteoporosis, and osteomalacia, as well as difficulties with metabolism and tissue structure, can develop from the mineral shortage in human and animal bodies. Applying bamboo shell clam flour eliminates these issues and consequently preserves the health of living things. This indicates that the mineral content of bamboo shell clam flour contributes positively to the health of living organisms. Based on the above discourse, we can formulate the following hypothesis:

H2: Mineral content in bamboo shell clam flour positively impacts the health of living beings.

In an essay based on empirical research, [Azwar, Chan, et al. \(2022\)](#) investigate the mineral content of bamboo shell meat flour and their significance in supporting the health of living organisms and the formation process. The study suggests multiple formation techniques for obtaining bamboo shell meat flour to analyze mineral content and create powder containing these elements from shell meat. When an appropriate technique is done, the mineral content of bamboo shell meat flour increases because it prevents the loss of volatile minerals. Minerals present in bamboo shell meat flour benefit living organisms' health. When an effective forming technique is applied, this procedure is hastened. Therefore, the creation process establishes a connection between the mineral content of bamboo shell meat flour and the health of living organisms. The study by [Azwar, Mahari, et al. \(2022\)](#) hypothesizes that the ash content production process utilized to create flour from bamboo shell meat affects the

body's creation of essential minerals. The bamboo shell meat flour is better for living things if the right degree of temperature and drying time are applied to the meat after boiling. Therefore, the creation process is essential for enhancing the contribution of bamboo shell meat flour to the health of living things. Hence.

H3: The formation process is an appropriate moderator between mineral content in bamboo shell meat flour and the health of living beings.

Abd-El-Aziz (2021) explore the relationship between the production process, the mineral content of bamboo shell clam flour, and the health of living organisms through an experiment. Scientists can produce nutrient flour without losing volatile minerals if they use bamboo shell clam to supply minerals for humans and an effective formation procedure for bamboo shell clam flour. As a result, bamboo shell clam flour is rich in nutrients and can assist users in reaching better health. Therefore, selecting an efficient production method for bamboo shell clam flour boosts the flour's mineral content, enhancing its contribution to the health of living organisms. Abd-El-Aziz (2021) focused on the relationship between the creation process, the mineral content of bamboo shell clam flour, and the health of living organisms. The study demonstrates that ash content analysis techniques, such as dry ashing, wet ashing, and low-temperature plasma dry ashing influence mineral content in bamboo shell clam flour based on the selection of an appropriate procedure for the production of flour from bamboo shell clams. Implementing an appropriate and proven formation procedure produces both macro and micro minerals in bamboo shell clam flour, allowing those who consume foods containing this flour to maintain their health more effectively. Based on previous literary arguments, it can be stated:

H4: The formation process is an appropriate moderator between mineral content in bamboo shell Clam flour and the health of living beings.

3. Research Methods

The study examines the influence of mineral content in bamboo shell meat flour and mineral content in bamboo

shell calm flour on the health of living organisms, as well as the moderating effect of the formation process on the relationship between mineral content in bamboo shell meat flour, mineral content in bamboo shell calm flour, and health of living organisms in Indonesia. Using questionnaires, the researchers have collected primary data from selected respondents. The questionnaires for the survey were derived from previously available materials. Mustafa, Naeem, Masood, and Farooq (2016) retrieved six items from the mineral content scale of bamboo shell meat flour. In addition, bamboo shells calm flour's mineral content on a six-item scale derived by (Kadirvel et al., 2018). In addition, the formation procedure includes a five-item scale derived from the work of Monnet, Laleg, Michon, and Micard (2019). The health of living things is measured by a four-item scale derived from (Lee et al., 2019) research.

In addition, the researchers have chosen pharmaceutical company analysts whose task is to assess the mineral composition of the product and employ these minerals to improve the health of living organisms. The pharmaceutical businesses have informed the researchers that approximately 1520 analysts work for the selected companies. According to Morgan's sample size calculation criterion, the study's sample size is 307. Thus, the researchers sent out approximately 530 surveys, but only 295 were returned a few days later. The response rate for these surveys is roughly 55.66 percent. In addition, the researchers employed smart-PLS to verify the link and validate the study's assumptions. It is an efficient statistical technique that works well with large and small data sets and yields the best results when used in complex frameworks (Ringle, Da Silva, & Bido, 2015). In addition, the study incorporated two predictors: mineral content in bamboo shell meat flour (MCBSMF) and mineral content in bamboo shell calm flour (MCBSCF). In addition, the research employed one moderator variable, such as the formation process (FP), and one dependent variable, such as the health of living organisms (HLB). These factors are presented in Figure 1 as the study's framework.

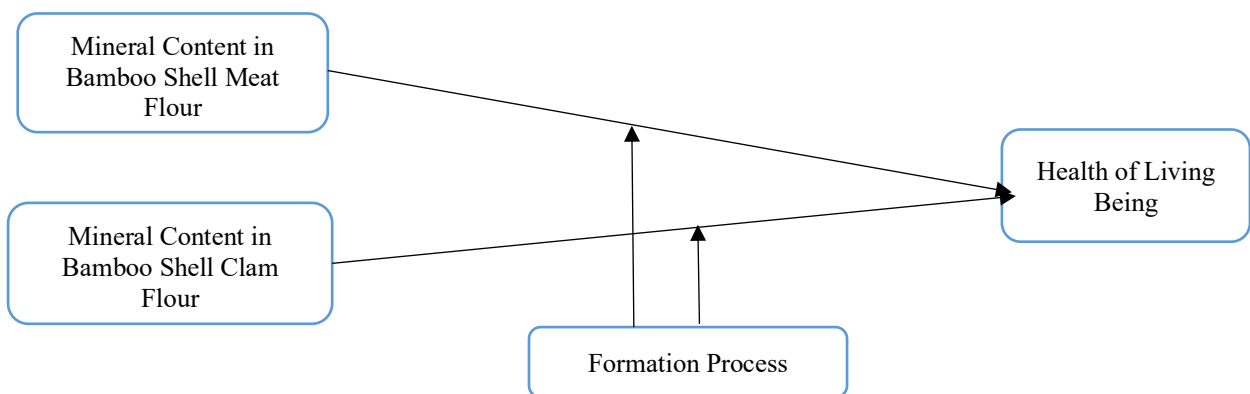


Figure 1: Theoretical Framework

4. Research Findings

This study's mineral composition included both macro and micro minerals. This study identified calcium (Ca), phosphorus (P), sodium (Na), potassium (K), and magnesium (Mg) as the macro mineral groupings (Mg). Microminerals include Zinc (Zn), Selenium (Se), and Iron

(Fe). Table 1 displays the average mineral content of meat meal and bamboo mussel shells from Kwanyar Bangkalan's coastal waters.

Table 1: Mineral content of meat flour and bamboo shell flour (Solen sp.)

No	Mineral	Meat Flour bamboo shells	Shell flour bamboo shells
Macro Mineral			
1	Calcium (Ca) mg /100 g	521.41 ± 26.23	52035.16 ± 989.87
2	Magnesium (Mg) mg /100 g	90.55 ± 2.68	20.29 ± 0.90
3	Phosphor (P) mg / kg	5074.30 ± 191.97	251.32 ± 8.15
4	Natrium (Na) mg / 100 g	157.25 ± 191.97	351.28 ± 14.35
5	Kalium (K) mg / 100 g	125.66 ± 3.26	21.37 ± 1.07
Micro Mineral			
1	Iron mg / 100 g	48.11 ± 1.95	4.44 ± 0.09
2	Zinc mg / 100 g	7.20 ± 0.27	0.19 ± 0.03
3	Selenium mcg / 100 g	27.45 ± 3.49	42.42 ± 8.209

Description: the average value of 3 repetitions

The study results demonstrate the content validity of utilizing factor loadings, and the value threshold for factor loadings is more significant than 0.50. Results revealed that values are more than 0.50, indicating content validity. In addition, the study results demonstrate convergent validity using average variance extracted (AVE), whose values must exceed 0.50 to meet the criteria. The results demonstrated that the values are

more significant than 0.50 and supported the validity of convergent validity. In addition, the study results demonstrate the examination of reliability using Alpha and composite reliability (CR), with the threshold for both criteria being more significant than 0.70. The findings revealed that the values are more significant than 0.70, indicating reliability. Table 2 displays the results mentioned above.

Table 2: Convergent validity

Constructs	Items	Loadings	Alpha	CR	AVE
Formation Process	FP1	0.863	0.916	0.937	0.749
	FP2	0.852			
	FP3	0.841			
	FP4	0.890			
	FP5	0.879			
Health of Living Being	HLB1	0.636	0.843	0.897	0.689
	HLB2	0.884			
	HLB3	0.896			
	HLB4	0.876			
Mineral Content in Bamboo Shell Clam Flour	MCBSCF1	0.952	0.959	0.968	0.834
	MCBSCF2	0.831			
	MCBSCF3	0.950			
	MCBSCF4	0.953			
	MCBSCF5	0.830			
	MCBSCF6	0.953			
Mineral Content in Bamboo Shell Meat Flour	MCBSMF1	0.944	0.971	0.977	0.875
	MCBSMF2	0.951			
	MCBSMF3	0.933			
	MCBSMF4	0.900			
	MCBSMF5	0.952			
	MCBSMF6	0.932			

In addition, the study results include an analysis of discriminant validity using the Fornell Larcker criterion, which requires the first value in the column to be greater than

the other values in the column. The results demonstrated that the first number in the column is more significant than the other values, indicating discriminant validity. Table 3 displays the results mentioned above.

Table 3: Fornell Larcker

	FP	HLB	MCBSCF	MCBSMF
FP	0.865			
HLB	0.367	0.830		
MCBSCF	0.402	0.435	0.913	
MCBSMF	0.414	0.385	0.500	0.936

In addition, the study results demonstrate the investigation of

discriminant validity using cross-loadings, with the cross-

loadings criteria requiring that the values that exposed the nexus with the variable itself be more significant than those that disclosed the nexus with other variables. The results

demonstrated that the usual requirements are met and demonstrated discriminant validity. Table 4 displays the results mentioned above.

Table 4: Cross-loadings

	FP	HLB	MCBSCF	MCBSMF
FP1	0.863	0.298	0.343	0.338
FP2	0.852	0.312	0.306	0.333
FP3	0.841	0.276	0.355	0.370
FP4	0.890	0.325	0.361	0.368
FP5	0.879	0.365	0.373	0.382
HLB1	0.243	0.636	0.245	0.336
HLB2	0.305	0.884	0.398	0.310
HLB3	0.346	0.896	0.404	0.332
HLB4	0.316	0.876	0.378	0.308
MCBSCF1	0.347	0.390	0.952	0.461
MCBSCF2	0.398	0.414	0.831	0.440
MCBSCF3	0.347	0.399	0.950	0.466
MCBSCF4	0.353	0.382	0.953	0.464
MCBSCF5	0.400	0.406	0.830	0.441
MCBSCF6	0.349	0.383	0.953	0.460
MCBSMF1	0.392	0.344	0.465	0.944
MCBSMF2	0.385	0.349	0.474	0.951
MCBSMF3	0.373	0.378	0.471	0.933
MCBSMF4	0.421	0.358	0.458	0.900
MCBSMF5	0.382	0.348	0.469	0.952
MCBSMF6	0.373	0.377	0.468	0.932

Moreover, the study results also examine discriminant validity using the Heterotrait Monotrait (HTMT) ratio. The threshold for the HTMT ratio criteria is that the values

should be lower than 0.90. The results exposed that the values are lower than 0.90 and indicated valid discriminant validity. Table 5 shows all the outcomes mentioned above

Table 5: Heterotrait Monotrait ratio

	FP	HLB	MCBSCF	MCBSMF
FP				
HLB	0.414			
MCBSCF	0.427	0.479		
MCBSMF	0.439	0.431	0.517	

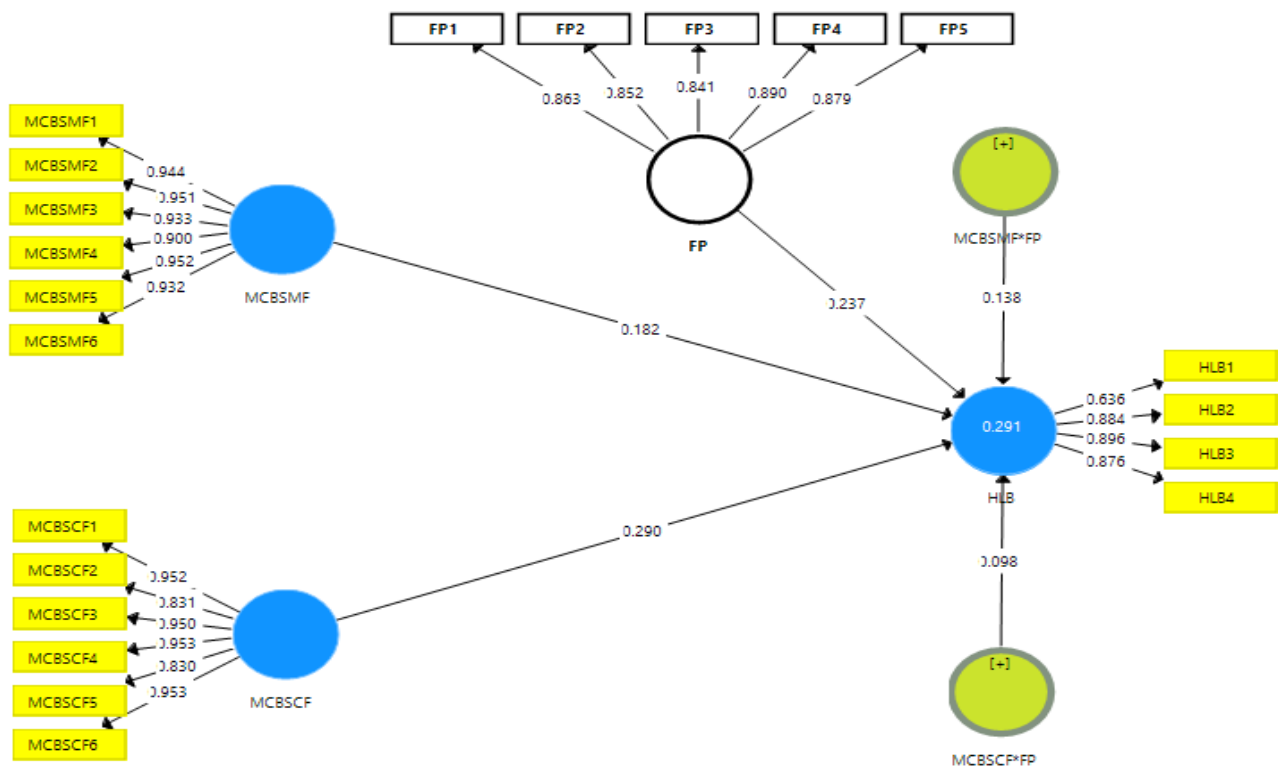


Figure 2: Measurement model assessment

The results revealed that the mineral content of bamboo

shell meat flour and bamboo shell calm flour had a good

5. Discussions

The results demonstrated that the mineral content of bamboo shell meat flour benefits the health of living organisms. These findings are also corroborated by (Lawal-Are, Moruf, Ogunbambo, & Abimbola, 2022). They investigate the mineral content of bamboo shell meat flour and its effect on consumers' health of any food or medicine containing it. Minerals such as Calcium, Magnesium, Phosphorus, Sodium, Potassium, Iron, Zinc, Selenium, etc., which are helpful to live organisms in varying quantities, are required by the bodies of all living organisms. The bamboo shell meat flour contains all of these minerals and promotes life's health. Living organisms can function more effectively by consuming these minerals in proper amounts. According to Jami, Kenari, Paknejad, and Mohseni (2019), bamboo shell meat flour contain various minerals, including calcium, phosphorus, magnesium, sodium, etc. These minerals sustain the health of the body and its functions, including the functions of cells, tissues, organs, and the body as a whole. Therefore, using bamboo shell meat flour in the form of food or medication assists living creatures in maintaining a healthy body and mind. These findings are also consistent with Berik, Çankırılıgil, and Gül (2017). They note that bamboo shell meat flour enables living organisms to contain minerals in adequate quantities and nutrients from essential general foods. This preserves the internal and external health of the body.

The results demonstrated that the mineral content of bamboo shell clam flour is beneficial to the health of living organisms. These results are also supported by Yek et al. (2022). They demonstrate that although bamboo shell clam is typically discarded as waste from bamboo shellfish, after being processed into flour, it is exceptionally beneficial to the health of living organisms due to its high mineral content, which includes calcium, magnesium, phosphorus, sodium, potassium, iron, zinc, and selenium, among others. These results are consistent with Woods, Goosen, Hoffman, and Pieterse (2020) findings, which shed light on the significance of bamboo shell clam flour's mineral content in promoting and preserving living organism health. According to this study, bamboo shell clam flour contains large calcium. Calcium is essential for the development of teeth and bones, as well as the maintenance of various tissues, mussels, and other organs. Therefore, the mineral content of bamboo shells promotes the health of living organisms, particularly during growth and pregnancy. Under the findings of Islam, Mondal, Bhowmik, Islam, and Begum (2017), bamboo shell clam flour, after undergoing a specific scientific process, develops a significant amount of macro minerals, such as calcium, magnesium, phosphorus, and sodium, which play a vital role in the maintenance of body structures such as bone, cartilage, and exoskeleton, as well as the control of blood circulation, cholesterol, and acid-base balance. Therefore, the mineral content of bamboo shell clam flour promotes and preserves health.

The results indicated that the production process moderates the relationship between the mineral content of bamboo shell meat flour and the health of living organisms. Woods et al. (2020) studied the development of bamboo shell meat flour for ash content generation, the mineral content created in bamboo shell meat flour, and its impact on the health of living organisms. This study suggests that adopting one of the three most prevalent ash content techniques, either dry ashing, wet ashing, or low-temperature plasma dry ashing, influences the mineral content of bamboo shell meat flour. If an appropriate formation method is done, bamboo shell meat flour will include a greater quantity of macro and micro minerals. The users of edible products using this flour will experience more health benefits and preserve their health. These results are also consistent with Chen et al. (2019). They note that the procedure used to create flour from bamboo shell meat for ash content influences the flour's ability to deliver essential minerals for a healthy body. Suppose those producing bamboo shell meat flour select the optimal temperature and dry the meat after boiling. In that case, the mineral content loss is minimized, and the resulting product is healthier for living things. Therefore, the formation process plays an appropriate role in boosting the health benefits of bamboo shell meat flour.

The results suggested that the production process moderates the relationship between the mineral content of bamboo shell clam flour and the health of living organisms. These findings are supported by Lilly, Immaculate, and Jamila (2017), which indicates that the study implies that when biologists use bamboo shell clam as a source of minerals for humans and adopt an effective formation process for bamboo shell clam flour, they can successfully produce nutrient flour without the loss of volatile minerals. In this way, bamboo shell clam flour is rich in minerals and can better assist consumers in achieving good health. Therefore, the selection of an efficient forming technique for bamboo shell clam flour increases its mineral content, thereby enhancing its contribution to the health of living organisms. These findings are also consistent with Abd-El-Aziz, Elsesy, and Hashem (2022) analysis of how bamboo shell clam flour's creation process influences its consumers' health. The study demonstrates that in the presence of an efficient creation process, the role of bamboo shell clam flour's mineral content in boosting the health of living organisms improves.

6. Implications

The consequences of this work are both theoretical and empirical. This study has significant theoretical value since it provides numerous advances to the body of knowledge. The study focuses on the role of bamboo shell flour in maintaining the health of living organisms. The study investigates the role of mineral content in bamboo shell meat flour and bamboo shell clam flour in promoting and maintaining health in living organisms. Before this, numerous studies merely examined the mineral content of

bamboo shells and their effects on the health of living organisms. Individual analyses of the effects of mineral content in bamboo shell meat flour and mineral content in bamboo shell clam flour on the health of living organisms are performed in this study. The utilization of the formation process as a moderator between the mineral content of bamboo shell meat flour and bamboo shell clam flour and the health of living organisms is also a significant contribution to the body of knowledge. This study illustrates how bamboo shells can improve the health of living creatures, making it of considerable importance in countries such as Indonesia, which have abundant sources of bamboo shells or other types of shellfish. This article aids policymakers in developing legislation concerning the proper use of the mineral in daily life and which wheat is healthier for living organisms. The study serves as a guide for professional medical analysts, government officials, and private citizens. It instructs experienced analysts in the medical sector on how to formulate bamboo shell meat flour and bamboo shell clam flour such that the flour contains both macro and micro minerals, enhancing the health benefits of bamboo shell meat flour and bamboo shell clam flour. It is suggested that the government should pay attention to the growth of bamboo shells and the production of bamboo shell meat flour and bamboo shell clam flour to boost the economy and the health of the country's inhabitants. It further clarifies that people should seek out appetizing products made with bamboo shell flour for improved health.

7. Conclusions

The study aimed to investigate the effects of the mineral content of bamboo shell meat flour and bamboo shell clam flour on the health of living organisms. It was also intended to investigate the relationship between the mineral content of bamboo shell meat flour and the mineral content of bamboo shell clam flour, as well as their roles in enhancing the health of living organisms. The quantitative research approach was utilized, and data on the effects of mineral content in bamboo shell meat flour and mineral content in bamboo shell clam flour on the health of living organisms was gathered using questionnaires disseminated to the medical sector of Indonesia. The results indicated that the mineral content of bamboo shell meat flour and bamboo shell clam flour had sound effects on the health of living organisms. The results suggested that if bamboo shell meat flour includes a high concentration of various minerals, it can be used to alleviate a variety of health problems and improve health. The results indicated that if bamboo shell clam flour has significant amounts of minerals such as calcium, magnesium, phosphorus, sodium, etc., the users of products containing this flour can maintain their health. The study reveals that when an effective forming technique is used to turn bamboo shell meat and bamboo shell clam into flour, the resulting bamboo shell meat flour and bamboo shell clam flour are rich in minerals and can therefore contribute more to the health of living organisms.

8. Limitations

Despite its numerous limitations, the current work has theoretical and empirical implications. This study explores the effect of the mineral content of bamboo shell beef flour and bamboo shell clam flour on the health of living organisms. The mineral content of bamboo shell flour is not the only factor that might affect the health of living things. Therefore, future authors must concentrate on additional aspects that affect the health of living things. Only a moderator of the formation process between mineral content in bamboo shell meat flour and mineral content in bamboo shell clam flour and the health of living organisms has been employed in this study. Future research should employ a mediator rather than a moderator between the issues under examination.

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