

## **Development of Superior Food Safety Management from Household in Covid-19 Pandemic and New Normal<sup>1</sup>, Dumasari Dumasari<sup>2</sup>**

### **Abstract**

Superior food protection management in households is urgent and crucial when facing the COVID-19 pandemic and the New Normal. Panic due to the scarcity and the increasing price of foods can be overcome with the development of protection management. This study examines the design for developing superior food safety management in households during the COVID-19 and New Normal pandemics. The research method is a survey with a qualitative approach. The research location was deliberately set in Banyumas Regency, Central Java Province, Indonesia. The study results show that there are five types of superior food consumed regularly by the informant's household. The five are staple foods, side dishes, vegetables, fruits, and spices. The informant's households faced the scarcity and the increasing price of these superior foods. It is just that every informant household has superior food safety management, which is still not completing the satisfactory factor during the pandemic and New Normal times. The development of superior food safety management in informant households requires completeness and readiness of economic elements, technology, local resources, and cooperation. The ability and skill of being aware are some of the elements that contribute to building superior food safety management. The key to the development of superior food safety also lies in the household's independence in adapting to the problems of COVID-19 and the New Normal.

**Keywords:** COVID-19 pandemic, food safety, management, self-sufficient, superior food

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<sup>1</sup> The findings from this study are very valuable to help solve the problem of the Covid 10 Pandemic and the New Normal. The development of food safety management at the household level that is sensitive to pandemics helps to overcome the problem of increasing the body's immunity of community members independently. We would like to thank the University of Muhammadiyah Purwokerto for their material and moral support.

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### **Introduction**

The COVID-19 (Coronavirus) disease has become a severe clinical syndrome and has disrupted the joints of people's lives in various countries around the world. The rapid and easy spread of transmission has resulted in the World Health Organization (WHO) declaration on March 11, 2020, that COVID-19 or SARS-COV-2 will be treated as a pandemic event. The COVID-19 pandemic causes acute respiratory problems and causes death, especially for the elderly and residents with weak personal health status (Wolfson & Leung, 2020). The condition of low immunity also makes it easier for everyone to get COVID-19 (Aman & Masood, 2020). Therefore, increasing the body's immunity is one of the efforts to prevent exposure to the dangerous COVID-19. Strengthening the body's immunity can be formed from adequate food and hygienic nutrition (Arshad et al., 2020). Personal hygiene and environmental sanitation, and social restrictions also help a person avoid the risk of being infected with COVID-19.

The resolution of the COVID-19 pandemic cannot only be solved by medical, clinical and health treatment. The issue of the Covid pandemic is multi-complex. One of the strategic efforts to be developed is to increase the body's immunity. Of course, this strategy is one of the earliest preventive measures. Healthy living by consuming nutritious food will increase immunity so that a person can survive the risk of severe impacts due to exposure to COVID-19 (Mishra & Patel, 2020; Han & Hoang, 2020). As long as the pandemic lasts until the

New Normal period, it is increasingly realized that COVID-19 cannot be avoided from human life and health. Its existence has become a part of human life. Therefore, it is necessary to commit so that each individual is able to defeat it through the formation of a robust immune system. The immune system protects against viruses and disease and produces antibodies to kill pathogens (Chowdhury et al., 2020). Of course, this requires readiness and support from various parties, especially the central government, local governments, health services, food producers, agricultural programs, food markets, food industry, transportation, education, pharmaceuticals, financial institutions, community leaders and others. Synergistic cooperation between parties is strong support for building immunity through the strength of food security at the household level.

Superior food safety during the pandemic and the New Normal serves as a fortress in the face of the Coronavirus attack that causes acute respiratory problems (Torero, 2020). All citizens around the world pay serious attention to the risk of exposure to COVID-19. Regional isolation, social restrictions and rules for working from home have disrupted food distribution routes. (Mayasari et al., 2020). Scarcity and rising prices of food have become challenging to control. This problem is worrying because it is prone to causing a decrease in the body's immunity (Aday & Aday, 2020; Torero, 2020). Disturbance in the distribution channel for food causes panic among residents who find it challenging to meet their daily food needs. The problem of scarcity and rising food prices during the pandemic and New Normal needs to be resolved wisely and appropriately. One strategy that can serve as an alternative solution is to establish and strengthen household food security. Household food security needs to be managed independently by utilizing local resources. A concept of food safety management needs to be studied to support the development of household food self-sufficiency, especially during the pandemic and New Normal. This theme is interesting and essential to be studied further. The results of the study are expected to contribute to solving the COVID-19 pandemic problem.

#### **Literature Review**

The COVID-19 pandemic is a disaster for human health worldwide. There have been too many material and non-material losses due to the impact of Covid, which has not subsided. The most frightening impact is when the pandemic causes millions of people in the world to die and have severe respiratory illness in various hospitals (Mayasari et al., 2020). The transmission of COVID-19 outbreak is rapidly spreading and hits all over countries in the world. The efforts to resolve this pandemic issue are carried out jointly between stakeholders such as the government, private, and community at international, national, regional, local, and even household levels. The completion technique is carried out in an integrated manner through prevention, treatment, healing and recovery.

The effects of the COVID-19 Pandemic are widespread. Not only health problems but also economic, social and cultural problems. The psychology of individuals and families of COVID-19 patients is also being disturbed (J Sritharan & Sritharan, 2020). Status as a survivor of COVID-19 makes a person seem alienated by people who are afraid of being infected. Patients and those who are positive for COVID-19, even though they are healthy, must be quarantined because they have the potential to transmit it to others. Various areas of life have also been affected by the pandemic. One of the areas most severely affected is the agricultural sector as a source of food (Workie et al., 2020). Food security and safety are also compromised (Chiwona-Karlton et al., 2021). A severe problem occurs as a threat of food insecurity because distribution and marketing channels are jammed during the pandemic (Chiwona-Karlton et al., 2021; Sinha, 2021). Therefore, the disease poses serious health, economic, psychological and social problems.

Prevention efforts are the best action to overcome the problem of the COVID-19 Pandemic. Strengthening the body's immunity is an essential part of preventive measures. This effort can be done by anyone as long as they have a firm intention, awareness and will. The commitment to avoid COVID-19 requires everyone to strengthen their body's immunity by implementing a healthy lifestyle, wearing masks, keeping distance, not crowding, consuming healthy, hygienic and nutritious food, drinking enough, guaranteed environmental sanitation and diligent handwashing habit with soap and clean water. Regular exercise also supports the formation of immunity during a pandemic. Immune enhancement becomes an interesting trending topic related to the COVID-19 outbreak (Wagner et al., 2020).

Immunity is a trending topic because it appears with many cases of speculative cures, treatments, and prevention strategies by increasing the body's immunity (Chessell, 2020). Fulfilment of healthy, hygienic and nutritious food is the most critical requirement in maintaining and increasing the body's immunity (Olaimat et al., 2020). The movement to strengthen the body's immunity needs to be carried out by every member of the

household (Yılmaz et al., 2020). Strengthening household food security is the main point of the invaluable immunity movement.

The development of household food security is multi-complex. The principle of self-sufficient is the driving force for that protection. Adaptive management makes it easier for households to develop food security based on local resources. The principle of food safety management cannot be separated from the existence of agriculture (Darma & Darma, 2020). Food safety management capital lies in knowing the types of food prioritized by households in daily consumption. Households believe these priority foods to be potential for strengthening the body's immunity. All types of priority food consumed to strengthen the body's immunity to survive COVID-19 are referred to as superior foods. Of course, every household consumes various types of superior food on the menu during the pandemic and the New Normal.

Superior food safety management is centred on households to be independent in preparing technology, economy, natural resources and integrative cooperation. Production technology and food processing of agricultural products need to be fulfilled in household food protection management. This management can be developed through the creation of household nutrition garden and medicinal plants. Preservation techniques are an essential element of household superior food safety management. Another element is the packaging technique so that the superior food served remains nutritious and hygienic.

Every household essentially owns food safety management. It is just that it still needs to be developed to suit the conditions and problems of the pandemic and the New Normal. Reconstruction of attitudes, opinions, actions is an inherent part of this management (Liao, et al., 2020). The development of food protection management has an essential function as a solution to scarcity and rising prices of superior food. Panic over the scarcity and increase in the price of superior food during a pandemic can also be reduced if households are able to develop independent and integrated management of food safety.

### **Research Methods**

The problem of this research is emphasized on research questions about how to design the development of household food safety management during the COVID-19 Pandemic and the New Normal. The research method used to answer the formulation of the problem is a survey. The research design uses a descriptive qualitative approach (Creswell, 1994). The research location was deliberately set in the Banyumas Regency, Central Java Province, Indonesia. The location of this study is one of the vulnerable areas to the threat of the COVID-19 pandemic because the population density is classified high in Central Java, Indonesia. The Banyumas area is a tourist center for Central Java. The level of population mobility in and out of Banyumas is relatively high because this area is a supplier of labor to foreign countries. Purwokerto as the capital of Banyumas is also one of the centers of higher education so that the flow of students and immigrants tends to be high.

The types of data collected include primary and secondary data. The primary data source in the form of research subjects consisted of all households living in the Banyumas Regency area. The research informants were determined intentionally with purposive sampling technique. Another primary data source is key informants determined by the snowball technique. Secondary data comes from documents and research articles that are relevant to the research theme.

Primary data collection techniques were carried out through in-depth interviews using telephone facilities and chatting via social media. In-depth interviews are guided by a list of questions that are structured in a questionnaire. Observations and focus group discussions were also conducted to collect primary data. Secondary data is carried out through search techniques and material content analysis. All the data collected were tested with the Triangulation Model to check the reliability, validity and data connectivity between themes.

Qualitative data processing techniques are carried out through the following stages: data entry, data filtering, data grouping, data categorization, inference, retesting and data presentation. The processed qualitative data was then analyzed using the Interactive Analysis Technique (M.B. Miles and A.M. Huberman, 1991). Another analytical technique is the Spradley Model to test the relationship between themes (Spradley, 1980). The results of data analysis are then interpreted and then presented in a systematic descriptive discussion.

### **Result and Discussion**

Food is an important element in dealing with the COVID-19 pandemic and the New Normal period (Chiwona-Karlton et al., 2021; Galanakis, 2020; Olaimat et al., 2020). Adequacy of food and nutrition of a

person is one of the determinants of body immunity so that it is prevented from Covid 19. Every household and community needs food safety management in order to have a defense against Covid 19 outbreak (Narasri et al., 2020). Several types of food have been favored during the pandemic until the New Normal period. The categorization of superior food ingredients includes staple food, side dishes, vegetables, fruits, and spices.

Informant households try to meet the needs of each type of superior food. Awareness of the benefits of consuming superior food emerged in the informant's household when there was panic facing the threat of COVID-19. Together with other community members, the informant's household directly or indirectly learned and shared information about how to increase the body's immunity. Consumption of superior food is prepared by the informant's household regularly every day. This statement is in accordance with the explanation of Ra, 45 years old, as follows:

"It is more difficult during a pandemic in serving food menus. Most of the household members stay at home to work, and their children also learn at home. So the need for food is increasing. The types are getting more diverse. There is rice with side dishes: vegetables and fruit. Herbal medicine is also consumed to be healthy and resistant to COVID-19. Several types of herbal ingredients are grown in the yard. To save money. The price keeps going up, especially ginger, so it is costly."

The categorization of each type of superior food has different commodities. Rice, corn, and cassava are the main types, as well as the instant noodle. It is just that the form is in the form of industrially processed food. The highest interest of the informant's household is to fulfill the need for consumption of the four primary staple food commodities, rice. Instant noodles functioned as a favorite staple food because it has the advantages of being durable, well packaged, easy to process and ready to serve. Meanwhile, corn and cassava are featured staple foods that complement the menu at times, especially in the afternoon and evening.

The main side dishes consumed by the informant's household consisted of eggs, tempeh, tofu, canned fish, freshwater fish, meat, and side dishes. Some of the leading side dishes are consumed by the informant's household regularly. The consumption pattern of the main side dishes carried out by the informant's household is different. The majority of informants' households use the first pattern to consume a varied menu of side dishes (> 1 type). Others use the second pattern to consume superior side dishes with a limited menu (< 2 types). The determination of the consumption pattern of side dishes depends on the economic condition of the informant's household. The most popular side dishes are chicken and duck eggs because those eggs can be found in the nearest market, and the availability of chicken and duck eggs is more secure than any other side dish. The price is also affordable for the informant's household. The process of food made from eggs is relatively easier using boiling, frying, and other techniques. The featured side dish of eggs is in great demand by the informant's household according to the explanation of Yr, age 34, as follows:

"Eggs are always in stock during a pandemic. Easier to buy. Prices are affordable too. Cooking is also easy to fry, boil or use as a mixture for vegetable menus. Household members prefer it when other spices are added."

Tempe and tofu are superior foods because they are local food ingredients. Informant households process these two types of food into various processed foods that can be stored for several weeks. Canned fish is also one of the top side dishes because it is durable, easy to process, and practically ready to serve. Freshwater fish, meat, and marine fish are usually directly consumed by the informant's household. These three types of superior side dishes are rarely stored because the processing is more complicated. The price is also higher so that not all informant households consume it regularly.

Several vegetable food commodities have become the mainstay of the informant's household during the COVID-19 Pandemic until the New Normal. Green vegetables are a favorite to be consumed every day. Informant households also consumed other vegetables, namely carrots, tomatoes, chilies, leeks, and cabbage. The various types of superior vegetables are processed well by mixing with other food ingredients such as beef soup and cap cay. The informant's household processes various food menus made from vegetables to increase body immunity during the pandemic. Some process it into vegetable salads and fiber juices. Superior vegetables do not last long. Therefore, the informant's household rarely saves vegetables for food stock.

The informant's household consumes several types of fruits that are believed can increasing the body's immunity. Consumption of fruit is increasing. Various types of featured fruits during the pandemic and the New Normal include oranges, red guava, papaya, dragon fruit, mango, and strawberry. The types of citrus that are featured are lemon, lime, and sweet orange. Some of these types of fruit cannot be stored for a long time so that household purchases are made routinely in quantities as needed. The most dominant fruits preferred by the informant's household are oranges, red guava, and papaya. The variety of fruit consumed by the informant's household during the pandemic is in accordance with the explanation of Ni, aged 52 years, as follows:

"Fruits are consumed in various ways. It is said that oranges and red guavas can prevent getting infected with COVID-19 and being bought and consumed. There are also other fruits, such as papaya and dragon fruit. Fruit is sometimes eaten right away. If we have time, to make it fruit juice is also considerable. So that it is easy for children to consume it."

Another type of food that excels is spices. This type of material is processed into powdered and liquid herbal medicine to be drunk as an immune booster during the pandemic. Consumer demand for several types of spices has increased during the pandemic and the New Normal. The price of ginger, garlic, turmeric, and shallots rose in the market. Its availability is getting scarcer. Such market conditions encourage informant households to stock up on spices at home. Another function of spices is as a natural flavoring and heating spice for food. Other types of spices needed by informant households during the pandemic and the New Normal were galangal, lemongrass, cinnamon, and Curcuma.

The informant's household used various methods to fulfill the need for superior food. The dominant way is to buy superior food through the use of retailer services. All informants had purchased superior food ingredients through intermediary traders. Another way is to buy directly in the market. It is just that during a pandemic, this method becomes more difficult because of government regulations that impose social restrictions and market lockdowns. Some informants obtain superior food needs from the harvest. It is just that a few informants can only do this method. The following way is to obtain several types of superior food through social activities with assistance from the government and the surrounding community. Rows of categorization of superior food types and how to fulfill them in a pandemic and New Normal are described in Table 1.

Table 1. Variety of Superior Food and How to Fulfill It

No.	Featured Types of Food	Variety of Commodities	How to Fulfill Needs			
			Buy Directly in the Market	Buying from Merchant Retailers	Yields	Help
	Featured Staples	Rice	√√	√√√	√	√
		Corn	√	√√	√√√	√
		Cassava	√	√√	√√√	√
		Instant noodles	√√	√√√	√	√
2.	Featured side dishes	Egg	√√	√√√	√	√
		Tempe	√√	√√√	-	-
		Tofu	√√	√√√	-	-
		Canned fish	√√	√√√	-	√
		Freshwater fish	√√	√√√	√	-
		Meat	√√	√√√	-	-
		Sea food	√√	√√√	-	-
3.	Featured vegetables	Green vegetable	√√	√√√	√	-
		Carrot	√√	√√√	-	-
		Tomato	√√	√√√	√	-
		Chili	√√	√√√	√	-

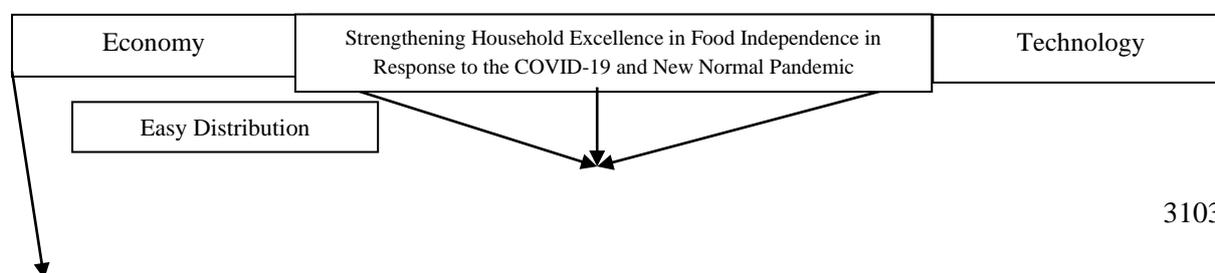
		Leek	√√	√√√	√	-
		Cabbage	√√	√√√	-	-
-4.	Fruits	Lemon	√√	√√√	-	--
		Lime	√√	√√√	-	-
		Sweet orange	√√	√√√	-	-
		Red guava	√√	√√	-	-
		Papaya	√√	√√√	√	-
		Dragon fruit	√√	√√√	√	-
		Mango	√√	√√√	√	-
		Strawberry	√√	√√√	√	-
		5.	Herbs and spices	Ginger	√√	√√√
Garlic	√√			√√√	√	-
Shallot	√√			√√√	√	-
Turmeric	√√			√√	√	-
Galangal	√√			√√√	√	-
Lemongrass	√√			√√√	√	-
Lengkuas	√√			√√√	√	-
Cinnamon	√√			√√√	√	-

All types of superior food listed in Table 1 require processing to be ready for consumption by the informant's household. In addition to processing techniques, the readiness of superior food to be consumed hygienically requires hygienic and healthy presentation and packaging techniques. The processing, packaging and presentation processes include a series of activities that the informant's household has considered. These three activities are part of superior food safety management during the COVID-19 Pandemic and the New Normal.

The economic readiness of the informant's household to fulfill the need for superior food is based on the conditions that determine their ability to form and develop food safety management. Not all informant households have the condition of economic readiness during the pandemic and the New Normal. The effects of regulations in accordance with the COVID-19 protocol are working from home, social restrictions, lockdowns, and restrictions on mobility between regions. As a consequence, several informant households also experienced job losses and decreased income. Informant Sr, 41 years old, said about the impact of the pandemic on his lost job as follows:

"I used to be a street food vendor. However, since the pandemic, other traders and I have been banned from selling. The reason is not to crowd. Must keep the social distance. Buyers are also deserted. Income decreased. Sometimes we did not have any income. The cost of basic needs is taken from savings. Now, I try to keep selling using e-commerce social media. It is good that some have ordered."

Assurance of availability is an essential element of superior food safety management during the COVID-19 Pandemic and the New Normal. The issue of guaranteeing the availability of superior food ingredients, which was severe during the pandemic and the New Normal, caused panic in the community, including the informant's household. Panic causes a tendency to act on superior food stocks. This reaction pushed the price of superior food to increase during the pandemic. Seriousness in motivating people to have independent food sources needs to be intensified. The activity of developing a food garden and household nutrition became an alternative solution that was started to be developed by several informant households. Of course, these efforts are an urgent part of food safety management during the pandemic and the New Normal. Superior food safety management started by informant households still requires certainty of actions that support sustainability. The development of superior food safety management that is sensitive to pandemics is listed in Figure 1.



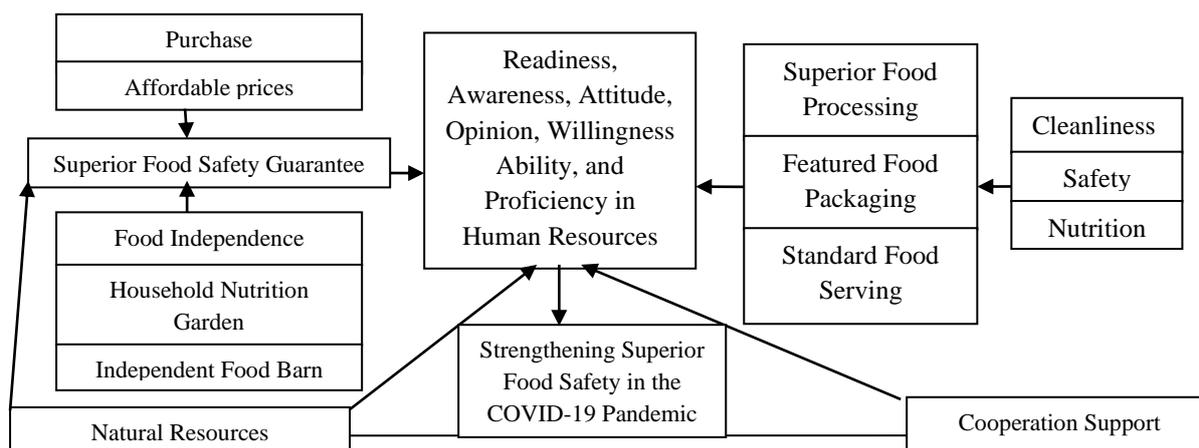


Figure 1. Development of Superior Food Safety Management from Households in the COVID-19 Pandemic and New Normal

Informant households stated that superior food safety management during the pandemic and the New Normal requires support and cooperation from the government, health services, community institutions, and fellow citizens. Integrative cooperation in the transformation of agricultural technology, food processing, improvement of food nutrition, and capital services is a prerequisite for establishing food independence. Another valuable asset from strengthening superior food management is the awareness, ability, and skills of households in developing nutrition garden activities, food barns, and medicine gardens for families.

The development of food safety management needs to be supported to become an optimal household safety from the dangers of food insecurity during the pandemic and New Normal.

The development of food safety management demands the ability of independent households to utilize local resources available in the surrounding environment (Dumasari, et al., 2019). Including the potential for agricultural waste that can be processed into a source of plant nutrients and feed for fish and livestock. The principle is to increase the capacity and quality of human resources. The goal orientation is to encourage and mobilize the behavior of skilled households to prepare food reserves independently. Therefore, the concept of developing superior food safety management attaches the meaning of participatory and pro environmentally friendly community empowerment (Dumasari et al., 2020; Santosa & Edy Priyono, 2012; Rashid et al., 2016; Dumasari et al., 2020).

The contribution of food safety management is valuable for strengthening the immune system. By carrying out household food safety management movement, various economic problems are reduced during the pandemic. Panic due to scarcity and rising prices of superior food can be suppressed. There is no doubt about the role of agriculture as a source of food. Agriculture functions as an enforcement pillar for superior food management, which can help reduce serious problems caused by the COVID-19 Pandemic.

The development of superior food safety management found in this study is in accordance with research findings (Narasri et al., 2020) in Thailand, which explains that women's food safety management needs to be supported by women and the public and private sectors. The concept of developing superior food safety management supports the results of previous research conducted by (Darma & Darma, 2020).

### Conclusion

Strengthening the body's immunity is the focus of attention during the COVID-19 pandemic and the New Normal. Strengthening immunity can be done through the development of superior household food safety management. The nature of food safety management of superior households is holistic and sustainable with a priority on self-reliance and based on local resources. Reconstruction of attitudes, opinions, and actions of community members is a driving force for developing superior food safety management for pandemic-sensitive households. The element existence of economy, technology, local resources, and joint cooperation is to build superior food safety management for households that are sensitive to pandemics.

An important recommendation from the results of this study is that the government should implement a national policy in the form of a leading food safety management movement that is sensitive to pandemics and crises at the household level. This recommendation is essential as the front line of action in controlling the pandemic. Preventive measures from being exposed to Covid 19 must start from the household level to be aware and able to maintain and increase the body's immunity for family members.

### References

1. Aday, S., & Aday, M. S. (2020). Impact of COVID-19 on the food supply chain. *Food Quality and Safety*, 4(4), 167–180. <https://doi.org/10.1093/fqsafe/fyaa024>
2. Aman, F., & Masood, S. (2020). How Nutrition can help to fight against COVID-19 Pandemic. *Pakistan Journal of Medical Sciences*, 36(COVID19-S4), 121–123.
3. Arshad, M. S., Khan, U., Sadiq, A., Khalid, W., Hussain, M., Yasmeen, A., Asghar, Z., & Rehana, H. (2020). Coronavirus disease (COVID-19) and immunity booster green foods: A mini review. *Food Science and Nutrition*, 8(8), 3971–3976. <https://doi.org/10.1002/fsn3.1719>
4. Chiwona-Karltun, L., Amuakwa-Mensah, F., Wamala-Larsson, C., Amuakwa-Mensah, S., Abu Hatab, A., Made, N., Taremwa, N. K., Melyoki, L., Rutashobya, L. K., Madonsela, T., Lourens, M., Stone, W., & Bizoza, A. R. (2021). COVID-19: From health crises to food security anxiety and policy implications. *Ambio*, 50(4), 794–811. <https://doi.org/10.1007/s13280-020-01481-y>
5. Chowdhury, M. A., Hossain, N., Kashem, M. A., Shahid, M. A., & Alam, A. (2020). Immune response in COVID-19: A review. *Journal of Infection and Public Health*, 13(11), 1619–1629. <https://doi.org/10.1016/j.jiph.2020.07.001>
6. Darma, S., & Darma, D. C. (2020). Food Security Management for Indonesia: The Strategy during the COVID-19 Pandemic. *Management Dynamics in the Knowledge Economy*, 8(4), 371. <https://doi.org/10.2478/mdke-2020-0024>
7. Dumasari, D; Darmawan, W; Iqbal, A; Dharmawan, B; Santosa, I. (2019). Development of production creativity among craftsmen by identifying techniques for characterizing coconut waste. *International Journal on Advanced Science, Engineering and Information Technology*, 9(2), 717–723. <https://doi.org/10.18517/ijaseit.9.2.5871>
8. Dumasari, Dumasari. Darmawan, Wayan. Iqbal, Achmad. Dharmawan, Budi. Santosa, I. (2020). A pro-conservation adaptation power model for cococraft craftsmen using coconut waste in Purbalingga, Central Java, Indonesia. *International Journal of Conservation Science*, 11(1), 87–96. [http://ijcs.ro/public/IJCS-20-08\\_Dumasari.pdf](http://ijcs.ro/public/IJCS-20-08_Dumasari.pdf)
9. Dumasari, Darmawan, W., Ismangil, Dharmawan, B., & Santosa, I. (2020). Empowerment of subsistence craftsmen through the adoption of environmentally friendly cocodust production technology. *International Journal on Advanced Science, Engineering and Information Technology*, 10(2), 691–702. <https://doi.org/10.18517/ijaseit.10.2.8522>
10. Galanakis, C. M. (2020). The food systems in the era of the coronavirus (COVID-19) pandemic crisis. *Foods*, 9(523), 1–10. <https://doi.org/10.1146/annurev-soc-060116-053252>
11. Han, B., & Hoang, B. X. (2020). Opinions on the current pandemic of COVID-19: Use functional food to boost our immune functions. *Journal of Infection and Public Health*, 13(12), 1811–1817. <https://doi.org/10.1016/j.jiph.2020.08.014>
12. Liao, Y., & Meng, L. (2020). Research on Social Psychology and Young People's Action in the Construction of Guangdong-Hong Kong-Macao Greater Bay Area. *Journal of Social and Political Sciences*, 3(1). <https://doi.org/10.31014/aior.1991.03.01.155>
13. Mayasari, N. R., Khanh, D., Ho, N., Lundy, D. J., Skalny, A. V., Tinkov, A. A., Teng, I., Wu, M., Faradina, A., Zaki, A., Mohammed, M., Park, J. M., Ngu, Y. J., Alin, S., Shofia, N. M., & Chang, J. (2020). Impacts of the COVID-19 pandemic on food security and diet-related lifestyle behaviors: An analytical study of google trends-based query volumes. *Nutrients*, 12(3103), 1–12.
14. Mishra, S., & Patel, M. (2020). Role of Nutrition on Immune System During COVID-19 Pandemic. *Journal of Food Nutrition and Health*, 3(2), 1–6. <https://www.alliedacademies.org/journal-food-nutrition-health/>

15. Narasri, P., Tantiprasoplap, S., Mekwiwatanawong, C., Sanongdej, W., & Piaseu, N. (2020). Management of food insecurity in the COVID-19 pandemic: a model of sustainable community development. *Health Care for Women International*, 41(11–12), 1363–1369. <https://doi.org/10.1080/07399332.2020.1823984>
16. Olaimat, A. N., Shahbaz, H. M., Fatima, N., Munir, S., & Holley, R. A. (2020). Food Safety During and After the Era of COVID-19 Pandemic. *Frontiers in Microbiology*, 11(August), 1–6. <https://doi.org/10.3389/fmicb.2020.01854>
17. Rashid, S. M. M., Islam, M. R., & Quamruzzaman, M. (2016). Which factor contribute most to empower farmers through e-agriculture in Bangladesh? *SpringerPlus*, 5(1), 1–14. <https://doi.org/10.1186/s40064-016-3443-3>
18. Santosa, I., & Edy Priyono, R. E. (2012). Diseminasi model pemberdayaan masyarakat desa melalui pengelolaan agrowisata. *Mimbar*, 28(2), 181–190.
19. Sinha, D. (2021). Hunger and food security in the times of COVID-19. *Journal of Social and Economic Development*, 0123456789. <https://doi.org/10.1007/s40847-020-00124-y>
20. Sriharan, J., & Sriharan, A. (2020). Emerging Mental Health Issues from the Novel Coronavirus (COVID-19) Pandemic. *Journal of Health and Medical Sciences*, 3(2). <https://doi.org/10.31014/aior.1994.03.02.109>
21. Torero, M. (2020). Without food, there can be no exit from the pandemic. *Nature*, 580(7805), 588–589. <https://doi.org/10.1038/d41586-020-01181-3>
22. Wagner, D. N., Marcon, A. R., & Caulfield, T. (2020). “immune Boosting” in the time of COVID: Selling immunity on Instagram. *Allergy, Asthma and Clinical Immunology*, 16(1), 1–5. <https://doi.org/10.1186/s13223-020-00474-6>
23. Wolfson, J. A., & Leung, C. W. (2020). Food insecurity during COVID-19: An acute crisis with long-term health implications. *American Journal of Public Health*, 110(12), 1763–1765. <https://doi.org/10.2105/AJPH.2020.305953>
24. Workie, E., Mackolil, J., Nyika, J., & Ramadas, S. (2020). Deciphering the impact of COVID-19 pandemic on food security, agriculture, and livelihoods: A review of the evidence from developing countries. *Current Research in Environmental Sustainability*, 2, 100014. <https://doi.org/10.1016/j.crsust.2020.100014>
25. Yılmaz, H. Ö., Aslan, R., & Unal, C. (2020). Effect of the COVID-19 pandemic on eating habits and food purchasing behaviors of university students. *Kesmas*, 15(3), 154–159. <https://doi.org/10.21109/KESMAS.V15I3.3897>