Quality test of current catfish nuggets in improving children’s health

S Widayani¹, T Darmi², T Agustina³, R M Astuti¹, D Elvita¹, N Aini¹ and A Dewantara¹

¹Home Economics Education, Faculty of Engineering, Universitas Negeri Semarang
50229, Sekaran Gunungpati Semarang

²Public Administration, Faculty of Social and Political Sciences: University of Muhammadiyah Bengkulu, Campus 4 UMB Jl H. Adam Malik, Bengkulu City

widayani_dr@mail.unnes.ac.id

Abstract. The covid-19 pandemic had the greatest impact on public health. The pandemic period has not ended and is still haunting the community. To maintain life, people must continue to do activities in meeting the nutritional needs of their families to be healthy so as to avoid the covid-19 virus. The impact of covid-19, more than 20% of children under five are malnourished. The pandemic condition has stirred and stirred the hearts of the research team to try out today's nutritious processed food for children to improve their health. It is suspected that the provision of food can contribute to the protein sufficiency of children under five years old. Hope that adequacy consumption of nuggets can improve health because they are used as snacks or side dishes. Therefore, the quality test of nugget products is very necessary. The research objectives were to: 1) study the quality of nuggets, and 2) determine the health level of children under five. Completely randomized design (CRD) method for product quality. Pure experiment with randomized control trial design on children under five in Gunungpati area purposively on nugget intervention was done. Anamnesis method was carried out to explore children's health and anthropometry with TB/U index to determine nutritional status. The study used 10 semi-expert panellists and 30 children under five years old. The results showed that nuggets were widely liked by children. Catfish nuggets can improve the health of children (p<0.05).

1. Introduction
The stunting rate in Indonesia is relatively high, the main causes are lack of food and difficulty eating, the attitude of parents who easily give up and surrender, and assume that the treatment is correct in giving consumption to children. One of the causes of the declining health of children under five and the increase in stunting, especially the position of the Covid-19 pandemic. Stunting, one of the causes of protein nutrition deficiency. Catfish nuggets are rich in protein, purposely invented to overcome children aversion in eating fish. Catfish was chosen by considering the low price originated from the dislike of children under five eating fish and the fact that mothers of toddlers often buy catfish [1]. Fried catfish is too often present in the daily menu, making children not like it. The non-variative processing of catfish triggers boredom which ends in children's dislike of fish. If this problem is left unchecked, children are threatened with protein deficiency due to limited fish consumption.
This phenomenon is the biggest trigger for protein malnutrition in children, especially from fish. Another trigger is the mother's low level of understanding about the importance of fish consumption and the benefits of fish protein for brain development and physical growth for children under five. The basic argument is that children really like processed food, one of which is nuggets, making catfish nuggets a great opportunity to contribute to children's protein needs. The COVID-19 pandemic is prolonged, causing health status to decline, and stunting to increase. This is exacerbated by the relatively low knowledge of maternal nutrition, resulting in giving consumption to children often not focusing on nutritional content, but based on their preferences. It is very ironic in Indonesia, where there is an abundance of fish, but many children lack protein nutrition as a cause of increased stunting. According to the Arini et al. [2] children need to get good nutrition, adequate stimulation and affordable quality health services, including early detection and early intervention for growth and development deviations so that they can grow and develop optimally according to their genetic potential and be able to compete in the global era.

Catfish nuggets which are proven to be high in protein quality 14.9% [3] can be tested for stunting reduction. In accordance with the government program that was revealed by President Jokowi on February 9, 2021 with the community, to reduce stunting to 14% from 27.6% in 2024. It is very important for researchers from academia to jointly realize the government's target. To support the program, it is necessary to increase the culture of liking fish so that the movement to popularize eating fish "gemarikan" can also be achieved. The habit of eating fish has not been entrenched among children. The level of fish consumption in Indonesia is relatively low compared to the potential of fishery resources owned [4], due to the lack of public understanding of the benefits of consuming fish, not optimal utilization due to substandard fish distribution, lack of infrastructure and myths that develop in the community. If this is allowed, the program to accelerate the reduction of stunting to 14% is very difficult and the probability of achieving it is low.

The purpose of the research is to study: the quality of nuggets and the level of health of children under five. The urgency of the research was to describe the present nutritious catfish nuggets as an alternative food to improve health. It is expected that in the future there will be a nutrition-conscious and healthy society towards a smart generation with high quality and competitiveness. In the coming year, research results can be collaborated with the nugget industry to be produced as a food-based intervention. Previous preliminary study on the application of Food Consumption Recall (FCR) method and nutritional status with anthropometry has been reported [5].

2. Research Methods
The research approach used is in 2 stages, i.e., laboratory research in stage 1 to test the quality of catfish nuggets by using research methods that can actually test the hypothesis of a causal relationship. Phase 2 is social research for product trials produced in phase 1 research in the laboratory.

The research in phase 1 used the true experimental method using simple random sampling technique. Meanwhile, the research method in organoleptic test was quasi-experimental with a completely randomized design (CRD). There are 5 (five) treatments with 3 repetitions. Research on making nuggets was carried out at the Catering Laboratory 1st Floor in May-June 2021. Organoleptic tests were carried out in the Organoleptic Test Room of Catering Lt 3, and protein chemical tests were carried out in the MIPA laboratory, Building D.

Phase 2 research conducted in the field using an experimental method, a randomized control trial design on children under five purposively. This research involves the process of giving treatment (intervention) to the subject at random. Subjects were grouped into 2 research samples, namely the control group and the treatment group. There are several methods to explore the data needed, including: Anamnesis method to explore the health of children under five, and anthropometry with TB/U index to determine stunting.

The sample size in laboratory research for the implementation of organoleptic tests was carried out by 10 trained panellists, lecturers of Catering FT UNNES with parameters of texture, taste, color and
aroma. While the sample in the field research was 30 children under five who were selected purposely for toddlers in Gunungpati.

Data processing consisted of coding, file structure preparation, data editing, data cleaning, merging and splitting files and variable development. Database and statistical analysis were carried out using an excel spreadsheet. For all interval data from quality, health and stunting variables, tests were carried out multiple regression analysis statistic with significance ($\alpha = 0.05$). Data processing and analysis using Microsoft Excel 365 program. Organoleptic test was carried out with parameters of texture, taste, colour and aroma, after that the data obtained were then analysed using Excel and RSM (Response Surface Method).

3. Result and Discussion
Sensory test results on 5 variants of catfish nuggets by ten expert panellists to assess the quality of the nuggets. The test was carried out in each expert panellists’ house with the study protocol. This was done because during the covid-19 pandemic it was not recommended to gather and huddle in the organoleptic test room. Based on sensory test results to 10 expert panellists to get quality catfish nuggets products can be presented in Table 1.

| Variant catfish nuggets | Number of people | Percentage |
|-------------------------|------------------|------------|
| Mushroom                | 6                | 60 %       |
| Red bean                | 2                | 20 %       |
| Carrot                  | 1                | 10 %       |
| Original                | 1                | 10 %       |
| Broccoli                | 0                | 0%         |
| Amount                  | 10               | 100%       |

Based on Table 1 above, the sequential quality catfish nuggets are 60.00% mushroom variant catfish nuggets, 20.00% red bean catfish nuggets, 10.00% carrot catfish nuggets, 10.00% original catfish nuggets, and 0% broccoli catfish nuggets. Five variant catfish nuggets are presented in figure 1.

Mushroom variant catfish nuggets are the quality nugget because it tastes and texture of mushroom giving different sensation compared to other flavours, the chewy texture of the mushroom seems to give it a new taste. Broccoli variant catfish nuggets do not get a value in the sensory test because of the unpleasant sensation, so the nuggets become tasteless. According to the results of Saragih’s research [6], panellists preferred oyster mushroom nuggets because the texture, taste, and colour were better than chicken nuggets. In another study the addition of white oyster mushrooms to the production of chicken nuggets was able to increase nutritional value and fibre [7]. Nuggets made with a ratio of
mushroom and molef koro kratok 60:40 showed the best effectiveness value, namely 0.57 which had the highest nutritional value [8].

Based on this study, mushroom variant nuggets were given to children under five years old in the Gunungpati Region. Mushroom nuggets were given for 1 month and observed using a control card. The results of observations for 1 month on 15 children under five years old gave good results, which could improve the health of children under five years old. It was found that children looked healthier than before being given catfish nuggets. In addition, children asked more nuggets after given a nugget of 50 grams. This means that children really like mushroom variant catfish nuggets. Study of Solichah et al. [9] revealed that sensory tests results found the insignificant different of four types of giant catfish nuggets with M. oleifera leaves. Giant catfish nuggets and moringa leaves have the potential of being developed into products that can be consumed widely. Similar finding was also obtained in the study of Hill et al. [10].

4. Conclusion

Based on the results of research on the quality of catfish nuggets, it is concluded that mushroom catfish nuggets are preferable for children. Mushroom catfish nuggets are very popular with children and can improve health. Nugget’s intake should be extended to enhance the health quality of children.

References

[1] Afiatna P and Maryanto S 2021 E3S Web of Conferences 317 04027
[2] Arini HRB, Hadju V, Thomas P and Ferguson M 2021 Asia Pacific Journal of Public Health 12 10105395211041001
[3] Hasanah L N and Fitriani R J 2021 J. Phys.: Conf. Ser. 1823 012113
[4] Djunaidah I S 2017 Jurnal Penyuluhan Perikanan dan Kelautan 11 12-24
[5] Widayani S and Triatma B 2021 IOP Conf. Ser.: Earth Environ. Sci. 700 012070
[6] Saragih R 2018 E-Journal WIDYA Kesehatan dan Lingkungan 1 90-95
[7] Setiaboma W and Kristanti D 2021 IOP Conf. Ser.: Mater. Sci. Eng. 1011 012014
[8] Nafi A, Isnaini N F and Putri D A 2016 LSP-Conference Proceeding 1471
[9] Solichah E, Iwansyah A C, Pramesdi D, Desnilasari D, Agustina W, Setiaboma W and Herminiati A 2021 Food Science and Technology 1-6
[10] Hill J I, Nelson R G, Woods K L, Weese J O and Whitis G N 2013 Aquaculture Economics & Management 17 123–147