



Milkfish nugget formulation with carrot and sweet corn modification towards nutritional status enhancement for underweight

Formulasi nugget bandeng dengan menambahkan wortel dan jagung manis dalam meningkatkan status gizi balita gizi kurang

Diza Fathamira Hamzah^{1*}, Elisa Putri²

¹ Fakultas Ilmu Kesehatan, Universitas Sains Cut Nyak Dhien, Langsa, Aceh, Indonesia.

E-mail: dizafathamira@gmail.com

² Fakultas Ilmu Kesehatan, Universitas Sains Cut Nyak Dhien, Langsa, Aceh, Indonesia.

E-mail: elisa.putrisyah@gmail.com

*Korespondensi:

Fakultas Ilmu Kesehatan, Universitas Sains Cut Nyak Dhien, Jalan Ahmad Yani No. 218 Kota Langsa, Provinsi Aceh, Indonesia. E-mail: dizafathamira@gmail.com

Riwayat Artikel:

Diterima tanggal 29 September 2020;

Direvisi tanggal 18 Desember 2020;

Disetujui tanggal 30 Januari 2021;

Dipublikasi tanggal 26 Mei 2021.

Penerbit:



Politeknik Kesehatan Aceh
Kementerian Kesehatan RI

© The Author(s). 2021 **Open Access**



Artikel ini telah dilakukan distribusi berdasarkan atas ketentuan *Lisensi Internasional Creative Commons Attribution 4.0*

Abstract

Milkfish nugget is one of nutritionally dense processed with a practical presentation and generally liked by children. To enrich the nutritional content, the manufacture of nuggets is modified with the addition of vegetables including carrots and sweet corn. The modification of milkfish nuggets with carrots and sweet corn can be used as additional food for underweight toddlers. This study aims to determine the effect of milkfish nuggets formulation with carrots and sweet corn modification. This research was a quasi-experiment with one group pre and post-test design. The sample was 37 with the total sampling method. The data was collected by observing the enhancement of toddlers' nutritional status during 10 days. Data were analyzed by using a paired T-test with a 95% confidence interval. The results showed the bodyweight average increase after giving milkfish nuggets was 800 grams with an enhancement in nutritional from the average Z-score value of -1,95 through the bodyweight for age indicator. The milkfish nuggets formulation had a significant effect in enhancing the nutritional status of underweight toddlers ($p= 0,002$). It is necessary to improve the quality of health programs especially regarding food intake for underweight toddlers to achieve the quality of the human development index.

Keywords: Malnutrition, nutritional status, supplementary feeding

Abstrak

Nugget ikan bandeng merupakan salah satu bentuk olahan daging ikan bandeng yang padat gizi dengan penyajian praktis dan disukai anak-anak pada umumnya. Untuk memperkaya kandungan nutrisi, pembuatan nugget dimodifikasi dengan penambahan sayuran antara lain wortel dan jagung manis. Adanya modifikasi nugget bandeng dengan sayuran wortel dan jagung dapat dijadikan sebagai makanan tambahan balita gizi kurang. Penelitian bertujuan untuk mengetahui pengaruh pemberian formulasi nugget bandeng modifikasi wortel dan jagung manis terhadap peningkatan status gizi pada balita gizi kurang. Desain penelitian merupakan quasi experiment dengan rancangan satu kelompok sebelum dan sesudah. Sampel sebanyak 37 balita dengan metode total sampling. Pengumpulan data dilakukan dengan pemantauan peningkatan berat badan balita selama 10 hari. Analisis data menggunakan uji T berpasangan dengan interval kepercayaan 95%. Hasil menunjukkan bahwa rata-rata peningkatan berat badan setelah pemberian nugget bandeng sebesar 800 gram dengan peningkatan status gizi yang dapat dilihat dari rata-rata nilai Z-score indeks BB/U yaitu sebesar -1,95. Pemberian nugget bandeng modifikasi wortel dan jagung manis berpengaruh dalam meningkatkan status gizi balita gizi kurang (nilai $p= 0,002$). Diharapkan adanya peningkatan kualitas program kesehatan dalam hal edukasi kesehatan khususnya tentang asupan makanan pada balita gizi kurang guna mencapai peningkatan kualitas SDM generasi bangsa melalui kegiatan peningkatan status gizi.

Kata Kunci: Malnutrisi, pemberian makanan tambahan, status gizi

Introduction

Toddlers period is an essential child moment aged 12 to 59 months which is the periode of growth and development children. Toddler is an age group that is included in the nutritionally vulnerable group with a very rapid growth process (Ibrahim, 2018). The success of children period is children's benchmark, that is why it should not be wasted. The achievement of successful growth and development toddlers is influenced by good nutritional status. Nutritional status is a reflection of the balance between nutritional intake, the human body and the environment. Good nutritional status in toddlers can be obtained through consumption patterns and parenting who have health-conscious (Jevita, 2015).

The nutrition status of the population in the district of Aceh was considered a public health problem. The malnutrition of under five-year children such as wasting, stunting, and underweight has brought a negative impact on the health of the community (Miko & Al-Rahmad, 2017). Langsa is one of the regions in Aceh Province that had 106 malnutrition toddlers in 2018. According to the Nutritional Report of the Langsa Health Service from January to June 2019, it was found that 37 belong to malnutrition toddlers (Dinas Kesehatan Langsa, 2019).

Every parent is obliged to monitor their children's health status, especially nutritional status. Nutritional status is one of the references for parents to reflect the adequacy of nutritional intake and the utilization of nutrients from food and beverages which consumed in every single day. Every children will achieve their optimal growth and development if their nutritional intake is fulfilled. Inadequate nutritional intake for toddlers will lead to various problems, namely malnutrition, which is impact in children's growth and development (Putri et al., 2015).

Generally, the incidence of malnutrition in toddlers is dominated by economic factors which damaged in family's inability to family food security. The incidence of malnutrition in toddlers can increase the risk of infectious diseases that interfere with the body's metabolic system, hormone system, and immune system. If the number of malnutrition toddlers increase in every year, the burden state will increase, consider that toddlers are the next generation of the nation (Lestari, 2016).

The management of malnutrition in toddlers can be done by supplementary feeding which is rich in nutrients. Milkfish is one of the marine products which is rich in fats, minerals, and vitamin, needed for growth and development in toddlers. As a source of animal protein, milkfish contain of complete amino acids, and it is close to the amino acid structure in human body (Karyanto, 2011) Milkfish (*Chanos chanos Forrskal*) is an original natural product of Langsa City which is rich in nutrients. The nutritional content in 100 grams of milkfish consists of 129 kcal of energy, 20 grams of protein, 4.8 g of fat, 20 mg of calcium, 150 mg of phosphorus, 2 mg of iron, 150 SI of vitamin A, and 0,05 mg of vitamin B1. Therefore, milkfish can be a solution for malnutrition toddlers (Siswanti et al., 2017).

Protein content of milkfish consists of several amino acids which are useful for fulfilling nutrition for toddlers. Lysine is an amino acid which is essential for the growth and development of toddlers (Irawati et al., 2016). In general, milkfish is consumed in the form of processed products which are in great demand and are currently prosing bussiness prospects (Imra et al., 2019). Milkfish can be processed into various types of food. One of which is used as nuggets. Milkfish nugget is a processed food of milkfish meat which is liked by children generally (Yazid et al., 2014). Besides, milkfish nuggets are nutrient-dense foods developed as a new product with technological innovation. Most milkfish nuggets only use one comestible. To enrich the nutrient content, the manufacture of nuggets is modified with the addition of vegetables including carrots and sweet corn (Yazid et al., 2014).

The addition of carrots and sweet corn as vegetables in milkfish nuggets is based on by many reasons. Carrots are a vegetable that is easily available and children favorable in general. No doubt about the nutrient content of carrots. Carrots are well-known as a vegetable source of provitamin A with high beta-carotene content (Yazid et al., 2014). Meanwhile, sweet corn contains vitamins A, B, and E as well as high fiber content which can prevent indigestion (Sitepu, 2018). In general, children like carrot and sweet corn because of the attractive taste and color. Based on the study of these problems, it is deemed necessary to identify supplementary feeding of milkfish nugget formulation (*Chanos forrskal*) with carrot and

sweet corn modification for malnutrition toddlers in Langsa City. As we all know, children are the nation's next-generation that must be considered both in terms of health and nutrition in particular.

Method

This study was quasi-experimental with one group pre and post-test design. The distribution of nuggets and the assesment of nutritional status were done in underweight toddlers' place. There are 45 underweight toddlers from January to June 2019. However, because the implementation fell in August 2020, so that there was a reduction in the number of underweight toddlers because they are no longer classified as toddlers, so the population of this study was 37 people. Because of the population less than 100, all the toddlers were drawn as the sample study by the total sampling method.

The sample size in this study used the Federer Formula as follows.

$$(t-1)(r-1) \geq 15$$

$$(2-1)(r-1) \geq 15$$

$$(r-1) \geq 15$$

$$r \geq 15 + 1$$

$$r \geq 16$$

information:

t = treatment group

r = sample size

The sample number needed is more than 16, so to anticipate the dropout rate for respondents it is necessary to add 10% of the total sample, namely 1.6 or equal to 2 underweight toddlers. Thus, the sample size is 18 children as the control group and 18 children as the treatment group. Hence, the total sample is 36 underweight toddlers.

Nugget that has been processed will produce $\pm 10,080$ pieces, or about 120 pieces equivalent of 3 kilograms to be consumed for 10 days by each underweight toddlers. Toddlers' nutritional status was measured by using an indicator of body weight for age (WFA), using the reference standard value of the Minister of Health Regulation No. 20 of 2020 concerning anthropometric standards for children (Kemenkes RI, 2020). Weighing

toddlers is carried out at the toddlers' house or the integrated service post if it is not possible to do at the toddlers' house. Weighing is done before giving the nuggets and after giving the nuggets to get the before and after of weight value. Eventually, the data were analyzed using by paired T-test, the results of which were compared with the p-value with a confidence level of 95%. Before the data were analyzed using the T-test, it has to confirm the data distribution using the data normality test the following results were obtained. Based on the results of the Shapiro Wilk analysis, it was found that the significance value of the initial nutritional status (pre-test) was 0,178 and the final nutritional status (post-test) was 0,27. This indicates that the data can be analyzed by using the paired T-test. The research has obtained ethical approval from the Health Research Ethics Commission of the Universitas Sumatera Utara, namely on December 29, 2020. Reference: 897/KEP/USU/2020.

Result and Discussion

Underweight Toddlers Characteristics

Health is a basic right that must be fulfilled by children, especially those aged 0 to 60 months. at this time, children become passive consumers and active consumers. This is also motivated by several things such as age, family income level and exclusive breastfeeding (Kusumaningtyas & Deliana, 2017). The main indicator before assessing the toddlers nutritional status is their characteristics, which can be seen in this table below.

Table 1. The characteristics of underweight toddlers

Characteristics	n	%
Sex		
Male	14	38,9
Female	22	61,1
Age		
Toddlers	15	41,7
Pre-school	21	58,3
Income		
Adequate	14	38,9
Less	22	61,1
Exclusive Breastfeeding		
Yes	8	22,2
No	28	77,8

The results indicated that most of malnutrition toddlers were women (37%). Basically, the incidence of sex malnutrition toddlers have no strong effect. There is no differences of values adopted in the family on the existence between male and female, so the treatment in parenting and feeding is the same way for boys and girls (Sukoco et al., 2015).

In general, toddlers do not yet have the perfect immunity organ maturity system, so it become easier for them to develop health problems. This can actually be helped by exclusive breastfeeding for 6 months. Children who were not breastfed for 6 months had a 3,85 times risk of malnutrition compared to children who were breastfed. On the other hand, exclusive breastfeeding for 6 months can protect toddlers from the dangers of infectious diseases which are closely related to their nutritional status (Donegan et al., 2010). Table 1 also shows that the age ratio of malnutrition toddlers between pre-school and toddlers is almost the same or only a difference of one, where preschool toddlers are 51,9% and toddlers are 48,1%. Also, the incidence of toddlers with pre-school age (37-59 months) was higher, due to higher activity compared to toddlers (12-36 months). This case makes a difficult way for mothers of malnutrition toddlers to control what food can consumed while outside. On the other hand, foods that are consumed are snacks with less nutrients (Rahmawati et al., 2019).

The Fulfillment of nutrient intake is inseparable from the purchasing power factor motivated by the level of income (Imelda et al., 2020). In general, families of malnutrition toddlers have an adequate level of income or meet the minimum wage rate of Langsa City, which is IDR 2.900.000. In general, families of malnutrition toddlers who have received aid government, can full their primary needs. In addition, families with sufficient income are usually more careful in allocating their household budgets and prioritizing food needs, so that their expenses do not exceed their income (Lestari, 2016).

The Nutritional Adequacy Rate of Carrot and Sweet Corn Modified Milkfish Nugget

Toddlers are a growth period that requires optimal nutritional intake, because at this time toddlers

experience very fast brain development and will stop at the age of three (Adriani & Vita, 2013).

The achievement of nutrient adequacy in malnutrition toddlers affects their health status, especially nutritional status. Fulfillment of nutritional status through the adequacy of macronutrients and micronutrients is the initial capital for toddlers to achieve optimal growth and development. Inadequacy or imbalance in fulfillment of nutrients will lead to nutritional problems, which are marked by weight loss and mismatched growth and development, and this, of course has an impact on the nation's human development index (Coly et al., 2006).

Milkfish nuggets with carrot and sweet corn modification is an alternative supplementary food towards a significant weight gain. Consumption of 300 gram milkfish nugget can supply several nutrient substances which can be seen in this following table.

Table 2. The nutrient content of milkfish nugget with carrot and sweet corn modification per service (300 gram)

Nutrient Content	Weight
Energy	391,2 kkal
Carbohydrate	55,5 gram
Protein	42,3 gram
Crude Fiber	15,72 mg
Betacarotene	41,7 mg

Table 2 described that in one package of the milkfish nugget contain for several the nutrient, including energy, carbohydrates, protein, crude fiber and beta-carotene. In general, malnutrition toddlers are toddlers (12-36 months) and preschool (37-59) months (Ouédraogo et al., 2019). It is referred to the Minister of Health Regulation No. 28 of 2019 concerning the daily nutritional adequacy rate of consumption, milkfish nuggets can contribute 28% of the energy from daily adequacy and 25% carbohydrates of the daily adequacy for toddlers. And, the milkfish nugget contains rich protein content, which is 42,3 grams and if compared with the nutritional adequacy rate, it can supply 170% of milkfish nuggets (Jago, 2019). So, it indicates that milkfish nugget is very necessary for malnutrition toddlers, considering the main function of protein is as a building substance. Building substances for malnutrition toddlers are needed in terms in

create new tissues for growth and development, and can be used as substances that can replace damaged tissues by producing enzymes and hormones in the body's metabolic processes (Kemenkes RI, 2019).

The quality human development index enhancement is inseparable from the nutritional factor as the main motor that can be assessed from the nutritional adequacy rate. Failure to fulfill nutrition will lead some health problems in children which if it lasts for a long time, the nutrient reserves will slowly run out and eventually cause tissue deterioration (Walker et al., 2007). Malnutrition toddlers are a real form of tissue deterioration characterized by body weight and development that is not appropriate for their age (Septiani, 2014).

The Milkfish Nugget Formulation With Carrot and Sweet Corn Modification towards the Nutritional Status Enhancement for Malnutrition Toddlers

The nutritional status enhancement of toddlers who were given milkfish nuggets with carrots and sweet corn modification was assessed by monitoring of body weight gain. Bodyweight is an indicator of nutritional status assessment that can describe the fulfillment of macro and micro nutrients in the body.

Bodyweight also indicates an improvement in the mass growth of children body tissue, which can be observed directly in a short time. Therefore, this research used the indicator of nutritional status assessment through body weight for age (WFA). The improvement result of toddlers nutritional can be seen in the table below.

Table 3. The nutritional status enhancement of underweight toddlers after giving the milkfish nugget with carrot and sweet corn modification

Enhancement	Treatment		Control	
	Pretest (%)	Posttest (%)	Pretest (%)	Posttest (%)
No	4 (22,2)	0 (0)	4 (22,2)	4 (22,2)
Yes	14 (77,8)	18 (100)	14 (77,8)	14 (77,8)

This is motivated by poor health conditions, among others, toddlers had an infectious disease such as diarrhea and some of them are teething so that their appetite decreases. The table above showed that the number and percentage of underweight based on the level of knowledge before and after intervention in the treatment group and the control group. Before the intervention was carried out, in the treatment group there were 4 (22,2%) underweight toddlers who have no enhancement and after the intervention there was no nutritional status enhancement of underweight toddlers (0%). While in the control group, after the pre-test and post-test were carried out the same results were obtained, including 4 (22,2%) people who did not have enhancement and 14 (77,8%) people who had nutritional status enhancement.

Milkfish nuggets were given for 10 days with 300 grams or \pm 25 pieces each person in every day. Nugget given to malnutrition toddlers can be used as a main meal (3 times a day) or as a snack food. The nugget was carried out for 10 days distribution which is believed to increase their body weight at least an average of 5 to 10 grams per kilogram per day (Unicef, 2018).

Based on the result, the average weight gain for malnutrition toddlers consuming milkfish nuggets for 10 days is 800 grams per kilogram of body weight. This is a benefit for toddlers to achieve normal nutritional status. Nugget can be used as an alternative supplementary food for toddlers with nutritional problems (Donegan et al., 2010), especially malnutrition toddlers. The nuggets have a nutrient-dense composition, such as, wheat flour, eggs, milkfish, carrots and corn.

Table 4. Effect of milkfish nugget formulation on improving the toddlers nutritional status

Body Weight	Mean	Z-score	SD	p-value
Before	9,5	-2,02	2,04	0,002
After	10,3	-1,95	2,01	

Table 4 showed that before giving nuggets the average weight was 9,5 kg. After the intervention for 10 days, the average body weight has increased by 800 grams. There was an effect for sure on improving the nutritional status. Measurement of nutritional status was carried out by anthropometric measurements based on body weight for age indicator. In the

measurement with the indicator of body weight for age, it is said that the nutritional status is good if it has a Z score of -2 SD to +2 SD. Before the intervention, the average Z score was -2,02 while after giving, the average Z score was -1,95. There is a difference in the Z score improvement of 0.07. This indicates that a significant increase in body weight affects improving nutritional status. Besides, the results of the paired T-Test in table 4 indicated that there was a significant difference in the average weight of malnutrition toddlers before and after consuming milkfish nuggets, which can be seen from the significance value of 0,002 ($p < 0,05$).

The results of these statistical tests showed that consumption of milkfish nuggets for 10 days has a significant effect on improving nutritional status based on measurements of body weight for age indicator, although it is not yet known a great strength influence of giving milkfish nuggets with the nutritional status. The increase in nutritional status that occurred was also not too high, due to the limited time for research during the pandemic period which was only allowed to study for 10 days.

Conclusion

Milkfish nuggets formulation with carrot and sweet corn modification can be used as a supplementary food because contain high calories and high protein. The body weight improvement brings an effect on nutritional status enhancement.

The nutritional status assessed through the body weight for age indicator with an average Z-score before giving of -2.02 and an average Z-score after giving of -1.95. The provision of milkfish nuggets with carrots and sweet corn modification had a significant effect on improving the nutritional status of underweight toddlers.

It is necessary to Langsa City Government to improve the management of malnutrition toddlers to do the target data collection correctly which can be an effort to aid distribution such as data collection for supplementary food aid or other aid. It is hoped to increase the quality of health programs both in the health sector and in other sectors in terms of health education, especially regarding food intake for malnutrition toddlers in the Langsa City area in order to achieve quality of human development index.

References

- Adriani, & Vita. (2013). Feeding pattern for under five children with malnutrition status in East Java, West Java and Central Kalimantan, year 2011. *Bulletin Penelitian Sistem Kesehatan*, 16(2), 185-193.
- Coly, A. N., Milet, J., Diallo, A., Ndiaye, T., Bénéfice, E., Simondon, F., Wade, S., & Simondon, K. B. (2006). Preschool stunting, adolescent migration, catch-up growth, and adult height in young Senegalese men and women of rural origin. *Journal of Nutrition*, 136(9), 2412-2420. <https://doi.org/10.1093/jn/136.9.2412>
- Dinas Kesehatan Langsa. (2019). *The nutritional report of Langsa city in 2019*.
- Donegan, S., Maluccio, J. A., Myers, C. K., Menon, P., Ruel, M. T., & Habicht, J. P. (2010). Two food-assisted maternal and child health nutrition programs helped mitigate the impact of economic hardship on child stunting in Haiti. *Journal of Nutrition*, 140(6), 1139-1145. <https://doi.org/10.3945/jn.109.114272>
- Ibrahim, I. A. (2018). The influence of giving purple sweet potato crackers (ipomea batatas l potret) on the malnutritional status of the 12-36 month old toddlers at the working area of Somba Opu Public Helath Center. *Jurnal Nasional Ilmu Kesehatan*, 1(2), 1-15.
- Imelda, I., Rahman, N., & Nur, R. (2020). Risk Factor On Stunting Among Children Age 2-5 Years Old In Biromaru Center Public Health. *Ghidza: Jurnal Gizi Dan Kesehatan*, 2(1), 39-43. <https://doi.org/10.22487/ghidza.v2i1.6>
- Imra, I., Fadnan Akhmadi, M., & Maulianawati, D. (2019). Calcium and phosfor fortification of crackers by using milkfish bone (Chanos chanos). *Jurnal Ilmiah Perikanan Dan Kelautan*, 11(1), 49. <https://doi.org/10.20473/jipk.v11i1.11911>
- Irawati, A., Ruf, W., & Anggo, A. (2016). The effect of cooking duration time of fried self boned milkfish (Chanos chanos forsk) into lysine and dissolved protein content. *Jurnal Pengolahan Dan Bioteknologi Hasil Perikanan*, 5(1), 106-111.
- Jago, F. (2019). Pengetahuan ibu, pola makan balita, dan pendapatan keluarga dengan status gizi pada balita di wilayah kerja Puskesmas Danga Kecamatan Aesesa

- Kabupaten Nagekeo. *Lontar: Journal of Community Health*, 1(1), 16–22. <https://doi.org/https://doi.org/10.35508/ljch.v1i1.2153>
- Jevita. (2015). Underweight toddlers in Cukir Diwek Jombang community health center area. *Ilmu Kebidanan*, 1(2), 39–42.
- Karyanto, Y. (2011). The enhancement of protein consumption for early childhood education children through formulation milkfish biscuits with vegetables (carrot and spinach) modification. *Buana Pendidikan*, 7(13), 37–44.
- Kemendes RI. (2019). *Regulation of the minister of health concerning recommended nutritional adequacy rates for Indonesian people* (Vol. 8, Issue 5).
- Kemendes RI. (2020). *Minister Health Regulation No. 2 Of 2020 Concerning Children's Anthropometry Standards*.
- Kusumaningtyas, D. E., & Deliana, S. M. (2017). Pattern of feeding on nutritional status of age 12-24 months in working mothers. *Public Health Perspective Journal*, 2(2), 155–167.
- Lestari, N. D. (2016). Analysis of determinants underweight toddlers in Kulon Progo community health center area. *Indonesian Journal of Nursing Practices*, 1(1), 15–21. <https://doi.org/10.18196/ijnp.1146>
- Miko, A., & Al-Rahmad, A. H. (2017). Hubungan berat dan tinggi badan orang tua dengan status gizi balita di Kabupaten Aceh Besar. *Gizi Indonesia*, 40(1), 21–34. <https://doi.org/https://doi.org/10.36457/gizindo.v40i1.222>
- Ouédraogo, O., Raketa, E. W. C., Sabiba, E. K. A., & Dicko, M. H. (2019). Toddlers' dietary diversity and its determinants in different agricultural periods. *International Journal Of Nutrition Sciences*, 4(3), 151–161. <https://doi.org/10.30476/IJNS.2019.82283.1018>
- Putri, R. F., Sulastri, D., & Lestari, Y. (2015). Factors Related To The Nutritional Status Of Underweight toddlers in Nanggalo, Padang community health center area. *Jurnal Kesehatan Andalas*, 4(1), 254–261. <https://doi.org/10.25077/jka.v4i1.231>
- Rahmawati, I., Utami, I., & Lestari, S. (2019). Factors associated with the incidence of underweight in toddlers aged 12-59 months in Srimartani village. In *Universitas 'Aisyiyah*. Universitas 'Aisyiyah.
- Septiani. (2014). Giving Effect of Food Supplement To Recovery in Children Less Nutrition Status of Changes in. *Jurnal Riset Gizi*, 2(2), 40–45.
- Siswanti, Anandito, R. B. K., & Fitri, A. (2017). The use of milkfish meat and bones (Chanos Chanos) on fish sticks as calcium and protein snacks. *Jurnal Teknologi Hasil Pertanian*, 10(1), 41–49. <https://doi.org/https://doi.org/10.20961/jthp.v10i1.17492>
- Sitepu, S. U. M. (2018). The utilization of milkfish (Chanos chanos forrskal), carrot and sweet corn in making nugget, nutritional content and acceptability. In *Fakultas Ilmu Kesehatan Masyarakat*. Univeritas Sumatra Utara.
- Sukoco, N. E. W., Pambudi, J., & Herawati, M. H. (2015). Relationship Between Nutritional Status of Children Under Five with Parents Who Work. *Buletin Penelitian Sistem Kesehatan*, 18(4), 387–397.
- Unicef. (2018). *Improved intake to increase weight in children with malnutrition*. Data.Unicef.Org. https://data.unicef.org/resources/improving-child-nutrition-the-achievable-imperative-for-global-progress/nutritionreport_april2013_final_29/
- Walker, S. P., Chang, S. M., Powell, C. A., Simonoff, E., & Grantham-McGregor, S. M. (2007). Early childhood stunting is associated with poor psychological functioning in late adolescence and effects are reduced by psychosocial stimulation. *Journal of Nutrition*, 137(11), 2464–2469. <https://doi.org/10.1093/jn/137.11.2464>
- Yazid, M., Bastianudin, A., Saputra, T., Triatmojo, S., Pertiwinigrum, A., Perdana, D. A., Ebrianto, A. L., Sari, T. I., Sumatera, K., Darmanto, A., Soeparman, S., Widhiyanuriawan, D., Khaerunnisa, G., Rahmawati, I., Putri, A., Salahuddin, N. S., Gumay, M. G., Wisudawati, N., Gustiar, F., ... Rahardjo, S. (2014). Analysis of omega 3,6,9 fatty acid and fenol content of smoke milk fish (Chanos chanos) with combining between smoking fireplace and irreplace smoking duration. *Jurnal Teknologi Kimia Dan Industri*, 2(1), 1–7.