

Utilizing Local Wisdom Community towards a Healthy Food Industry: A Preliminary Research of Torbangun Leaves Biscuit

Donal Nababan,

Department of Public Health,
Universitas Sumatera Utara
Medan, Indonesia

Rizabuana Ismail,

Master's of Sociology Program
Universitas Sumatera Utara
Medan, Indonesia
rizabuana@usu.ac.id

Ivana Tiar

Universitas Negeri Jakarta
Jakarta, Indonesia

Abstract

In the Batak ethnic group in Indonesia, found that local wisdom in the community that torbangun leaves (*Coleus Amboinicus L.*) is believed to improve the quality of breast milk to be given to infants aged 12-24 months. Various studies show that torbangun leaf contains elements that can increase baby's height and nutrition. This paper shows that torbangun leaves are suitable for nursing mothers in a practical, comfortable, and healthy form according to the standards of the Ministry of Health of the Republic of Indonesia, namely in the form of biscuits. The research was conducted experimentally to obtain biscuits from torbangun leaves based on the biscuits' aroma, texture, taste, and color. The last method is to intervene in stunting children aged 12-24 months. Children were grouped into children who were given biscuits with torbangun leaves and children who were given biscuits without torbangun leaves for 3 months every day. The findings from the organoleptic test showed that the most suitable biscuits to be given to children aged 12-24 months were biscuits with the addition of torbangun leaf flour. There was a significant difference in body length in children who were given biscuits mixed with torbangun leaves and biscuits without torbangun leaves.

Keywords

Local Wisdom, Torbangun leaves, Healthy Food, Food Industry

1. Introduction

In the Batak community in Indonesia, they have had various local wisdom from generation to generation. Not only in terms of treating disease (Manurung, 2017; Ismail, 2020) but also in using herbal plants as medicine. Mothers in this area who are breastfeeding have a habit of consuming and using torbangun leaves (*Coleus amboinicuslour*). Besides aiming to maintain the balance of the body of a mother who has just given birth, this torbangun leaf is believed to be able to improve the quality and quantity of breast milk (Damanik, 2008). The fulfillment of the nutritional needs of children aged 12-24 months is carried out by utilizing the potential of local food ingredients, which are usually consumed in accordance with the habits and customs of the local community. Besides being cheap and easy to obtain, community empowerment is also not difficult because it has become their own culture (Nababan, 2017). Usually, these leaves are consumed in the form of soup, where the torbangun leaf soup will be mixed with boiled chicken and eggs. The soup is made by boiling torbangun leaves in coconut milk and adding various complementary spices. In

order not to go stale, the soup is added to a synthetic compound commonly used to preserve food called butylated hydroxytoluene as an antioxidant.

The nutritional content contained in torbangun leaves per 100 grams (Batubara, 2004; Damanik, 2006, Ade Chandra, 2017), are iron 13.6 mg, vitamin C, vitamin B, energy 27.0 calories, protein 1.3 g, fat 0.6 g, carbohydrates, calcium, phosphorus, total carotene, and water, which are very beneficial for baby's growth. The use of torbangun leaves in the form of biscuits has never been produced in the market. This paper describes how torbangun leaves (*Coleus amboinicuslour*) can be served in the form of biscuits so that it is more practical, comfortable, hygienic and can fulfill nutrition to be given to babies aged 12-24 months.

1.1 Torbangun Leaves (*Coleus AmboinicusLour*) To Overcome Stunting Children

Stunting can be defined as a short and very short body condition so that it exceeds a deficit of -2 below the median length or height (Manary and Solomons, 2009). The Vilcins study (2018), suggests that environmental factors also affect the occurrence of stunting in children, among others, influenced by water and poor sanitation (Merchant, 2003; Fink G, 2011, Hammers, 2013), solid waste disposal (Ricci JA, 1996), aflatoxin (Gong, 2003, Gong 2004, Shouman 2012, Shirima, 2010), cooking Biomass fuel (Machisa, 2013). Although there are many studies that mention the determinant factor of stunting is malnutrition. (Berti, 1998; Rayhan, 2006; Rahman, 2007; Ortiz, 2014). Chronic and acute malnutrition is very high in children under 24 months of age when compared to children aged 24-59 months. In India (Sinha RK, 2018), this is due to maternal nutrition, food security, poverty status, water and sanitation facilities, control infections, and address regional disparities. Furthermore, in Botswana Kenya, malnutrition was found in children aged < 3 years, namely very thin 5.5%, short 38.7%, and malnutrition 15.6% (Mahgoub, 2006).

Data from Basic Health Research in Indonesia (2010) show that the national prevalence of stunting and stunting based on the height index by age is 35.6%, consisting of 18.5% very short and 17.1% short. This figure is worrying because it is far above the tolerance limit of the World Health Organization (WHO) which sets the figure of 20% so that Indonesia is in fifth place in the number of children with stunting conditions (Kompas, 2017). Meanwhile, based on regional grouping based on stunting prevalence, which is also determined by WHO, in this study area the stunting prevalence rate for children under five is in a very high area, namely 42.3%. The Ministry of Health of the Republic of Indonesia (2007), decided to improve the nutritional status of children aged 12-24 months as a substitute for breast milk in the form of biscuits. Biscuits are made of various types, mainly distinguished by the balance that exists between the main ingredients of flour, sugar, fat, and eggs. Then also additional ingredients such as chocolate, fruits, vegetables, and spices have an influence on taste (Johantika, 2002). Add research objectives here. Make sure to fulfil all the research objectives at the end and articulate in the conclusion. Focus on key unique research contributions.

2. Methods

This research was conducted systematically in the form of experimental research to obtain biscuits from torbangun leaves based on the attractive aroma, texture, taste, and color of torbangun leaf biscuits and analyze the nutritional content of torbangun leaf biscuits. For the purposes of this test, three choices of torbangun leaf biscuits were provided, namely each biscuit with the addition of 10%, 20%, and 30% torbangun leaf flour in every 100gr of biscuit. This flour consists of fresh torbangun leaves and is mixed with the ingredients for making biscuits. The selection of fresh torbangun leaves is done through sorting and washing. Next, the drying will be carried out with a drying device (drying oven), and then milling will be carried out with a blender. Torbangun leaf flour that will be used is obtained after the sieving process. Making biscuits with the addition of torbangun leaves was carried out through organoleptic tests with hedonic rating tests and analysis of the nutritional content of the biscuit products produced. The process of making biscuits includes the preparation of dough ingredients (wheat flour, skim milk, sugar, margarine, baking powder, and egg yolks), mixing of dough ingredients, and torbangun leaf flour, forming and printing dough sheets, baking in an oven to produce torbangun leaf biscuits.

Furthermore, interventions were carried out on stunted children aged 12-24 months. These children were grouped into children who were given biscuits with torbangun leaves and children who were given biscuits without torbangun leaves for 3 months every day. In the study area, 238 children were found, consisting of 82 stunted children and 156

non-stunted children. Then, 68 children were selected who belong to the stunting category and will be given biscuits. After that, they were grouped into 34 children who were given biscuits with torbangun leaves, and another 34 children were given biscuits without torbangun leaves. Determination of the sample is based on the willingness of parents after signing the agreement (informed consent). This study is an experimental study with a 'single-blind randomized controlled' design, meaning that the sample does not know which is the treatment group and which is the control group because the biscuits given are packaged the same regardless of the shape of the biscuits. The difference between the two is only known by specially trained officers.

3. Results and Discussion

3.1. Analysis of Nutritional Content of Torbangun Leaf Biscuits and Torbangun Leafless Biscuits.

After going through the process of making biscuits that are mixed with torbangun leaves and without a mixture, an analysis of the nutritional value of the biscuits is carried out below (Table 1):

Table 1. Composition, Method of Analysis and Nutritional value of biscuits with the addition of Torbangun leaves and biscuits without the addition of Torbangun leaves.

No.	Nutrient Composition	Method	Amount	
			Torbangun Leafless Biscuits	Biscuits with Torbangun Leaves
1.	Calorie (kkal/100 g)	Atwater factor	366.21	457.68
2.	Protein (g/100 g)	Kjedahl	5.72	7.41
3.	Fat (g/100 g)	ExtrakksiSoklet	19.50	24.73
4.	Carbohydrate (g/100 g)	AOAC 2005	53.44	61.59
5.	Vitamin C (mg/100 g)	AAS	0.36	0.58
6.	Ash (g/100 g)	Gravimetri	0.85	1.20
7.	Water (g/100 g)	Gravimetri	4.30	5.13
8.	Iron (mg/100 g)	AAS	5.28	7.49
9.	Calcium (g/100 g)	Spektrofotometri	4.07	4.65
10.	Soluble Dietary Fiber (g/100 g)	SNI 01.2891.1992	0.65	0.91
11.	Insoluble Dietary Fiber (g/100 g)	SNI 01.2891.1992	0.84	1.10

Source: Primer Data, 2017

Based on the results of the above examination, it is known that torbangun leaf biscuits have a higher nutritional value than biscuits without torbangun leaf as a control.

3.2. Determination of Taste, Aroma, Texture, and Color of Torbangun Leaf Biscuits

From the results of the initial study below, it was found that biscuits with the addition of 20% torbangun leaf flour were the best. Meanwhile, with the addition of 30% torbangun leaf flour, the biscuits already tasted gritty. This condition is feared to be disliked by stunting children aged 12-24 months. In addition, better color and texture of torbangun leaf biscuits, better taste was also found in torbangun leaf biscuits with the addition of 20% torbangun leaf flour compared to the addition of 30% torbangun leaf flour (Table 2).

Table 2. The Average Score of Organoleptic Test on the Taste, Aroma, Texture and Color of Torbangun Leaf Biscuits

No.	Types of Biscuits	The average value of the Organoleptic Test Score (Mean)			
		Flavor	Scent	Texture	Color
1.	A (10 %)	3,8667	3,8667	4,0333	3,9667
2.	B (20%)	4,2667	4,3333	4,4333	4,3333
3.	C (30%)	3,9000	3,9000	3,9667	3,9000
Total		4,0111	4,0333	4,1444	4,0667

Source: Primer Data, 2017

3.3. Analysis of the Effect of Giving Torbangun Leaf Biscuits on the Nutritional Status of Stunting Children aged 12-24 Months.

This section describes the results of research on the characteristics of children and the average food consumption of stunted children by group before the intervention was implemented. This analysis is performed to ensure that there is no difference between the initial conditions in the intervention group and the control group. Children's characteristics are independent variables consisting of a history of low birth weight, mother's education, drinking water sources, toilet ownership status, kitchen-house boundaries and monthly income.

Table 3. Frequency distribution of children's characteristics in the control group and the treatment group

No. Child Characteristics	Group				P Value
	Control	Treatment	N	%	
1. BBLR History					
a. No	18	52.9	16	47.1	
b. Yes	16	47.1	18	52.9	0.628
	Total	34	100	34	100
2. Mother's Education					
a. Basic	22	64.7	20	58.8	
b. Intermediate and University	12	35.3	14	41.2	0.618
	Total	34	100	34	100
3. Drinking water source					
a. Unprotected	22	64.7	20	58.8	
b. Protected	12	35.3	14	41.2	0.139
	Total	34	100	34	100
4. Toilet ownership status					
a. No toilet	11	32.4	10	29.4	
b. Own toilet	23	67.8	24	70.6	0.793
	Total	34	100	34	100
5. Kitchen boundary with home room					
a. No boundary	11	32.4	10	29.4	
b. Have boundary	23	67.8	24	70.6	0.074
	Total	34	100	34	100
6. Monthly income					
a. IDR 1.500.000	9	26.5	10	29.4	
b. IDR 1.500.000 - 2.500.000	19	55.9	16	47.1	
c. IDR > 2.500.00	6	17.6	8	23.5	0.742
	Total	34	100	34	100

Source: Data Primer, 2017

Based on the table 3 above, it was found that in the control group most of the children did not have a history of LBW, namely 18 people (52.9%). While in the treatment group, most of the children had a history of LBW, namely 18 people (52.9%). Based on the results of statistical tests, it is known that there is no significant difference in the history of LBW between the treatment group and the control group ($p > 0.5$). Likewise, for other child characteristics items, namely: based on mother's education, drinking water source, toilet ownership status, kitchen-to-house boundary and monthly income, there was no significant difference between the treatment group and the control group ($p > 0.5$).

Meanwhile, the average food consumption of stunted children aged 12-24 months before the intervention was carried out, was analyzed through nutritional content such as energy, protein, fat, carbohydrates, vitamin C, iron, calcium, and soluble dietary fiber. The source of the data used is food recall data, then processed using the nutrition survey program. After that, to see the difference in food intake of the two groups, it was tested using the SPSS program.

Table 4. Average Food Consumption in Stunting Children Aged 12-24 Months Before and After the Intervention Was Implemented.

No.	Nutrient Composition	Amount of Consumption		P Value
		Intervention	Control	
1.	Calorie (kkal/100 g)	749.21	821.43	0.128
2.	Protein (g/100 g)	22.92	25.26	0.053
3.	Fat (g/100 g)	20.83	23.32	0.439
4.	Carbohydrate (g/100 g)	121.54	110.92	0.192
5.	Vitamin C (mg/100 g)	16.35	14.04	0.271
6.	Iron (mg/100 g)	3.38	3.60	0.439
7.	Calcium (g/100 g)	151.29	191.22	0.156
8.	Soluble Dietary Fiber(g/100 g)	2.62	3.00	0.211

Source: Primer Data, 2017

Based on the table 4 above, there was no difference in food consumption in stunted children aged 12-24 months in the intervention group and the control group before the intervention was implemented. This can be seen from the p value of each nutrient composition > 0.00 meaning H_0 is accepted. However, when compared with the nutritional adequacy rate for children 1-3 years, the nutrients needed for food consumption in stunted children aged 12-24 months are still lacking (Regulation of the Minister of Health of the Republic of Indonesia, No. 75 of 2013). Lack of nutrients in these children is expected to be replaced by the nutrients contained in torbangun leaf biscuits.

Table 5. Results of Descriptive Analysis of Children's Body Length in Treatment and Control Groups Before and After Intervention and Differences in Child Body Length Gain, By Giving Torbangun Leaf Biscuits as Much As 6 Pieces (60 Grams).

Body Length	Treatment			Control			t	P Value
	Minimum	Maximum	Average	Minimum	Maximum	Average		
Before intervention	67.00	76.00	72.10	69.40	76.00	72.68	-	-
After intervention	70.70	79.00	75.25	69.80	76.80	73.21	-	-
Addition difference	02.00	04.00	03.23	01.50	03.30	02.60	5.128	0.001

Source: Primer Data, 2017

Based on the table 5, it is known that the body length of children in both the treatment group and the control group both experienced an increase. However, when viewed from the difference in body length gain, the average body length in the treatment (03.23) was higher than the control group (02.60). Meanwhile, through the t-test found the value of $p = 0.001$ ($p < 0.005$). That is, there is a difference in the difference in body length gain of children in the treatment group when compared to the control group. In other words, it can be interpreted that consuming torbangun leaf biscuits has a greater contribution to the growth of stunted children's body length when compared to consuming ordinary biscuits without torbangun leaves.

4. Conclusion

From the results of organoleptic tests, the most suitable biscuits given to children aged 12-24 months were biscuits with the addition of torbangun leaf flour. The nutritional content of torbangun leaf biscuits is higher when compared to biscuits without torbangun leaves. So that the increase in body length is higher when consuming biscuits with a mixture of torbangun leaves. Prevention and control of stunting in children can be done by using local food ingredients, namely torbangun leaves which are used as complementary food for torbangun leaf biscuits. Thus, this initial study is more useful if there is an industry that can develop it in the form of biscuits so that it becomes a healthy food to overcome stunting children.

References

- Ade Chandra Iwansyah, Muhammad Rizal MartuaDamanik, LilikKustiyah, Muhammad Hanafi. 2017. The Potency of Ethyl Acetate Fraction of Coleus amboinicus L. leaves in Improving Milk Yield, Body Weight of Rat and Their Pups. *JurnalGiziPangan*, 12 (1): 61-68
- Batubara I, Mirtaningtyas V, Setyawan A, Haryati A, NurmalaI. 2004. ProfilUnsur-UnsurPenting (P, K, Ca, Mg, dan Fe) Flavonoid DaunTorbangun (Coleus amboinicusLour) sebagaiGambaranDaunTorbangunDalamKesehatanMasyarakat. Bogor: PusatStudiBiofarmaka LPPM IPB.
- Berti Peter R., William R. Leonard; Wilma J. Berti. 1998. Stunting in an Andean community: Prevalence and etiology. *American Journal of Human Biology*, Vol 10 (2): 229-240
- Damanik R, Wahlqvist ML, Wattanapenpaiboon N. 2006. Lactagogue Effects of Torbangun, a Batakne Traditional Cuisine. *Asia Pacific Journal of Clinical Nutrition*, Vol. 15 (2): 267-74
- Damanik R. 2008. Torbangun (Coleus AmboinicusLour): A Batakne Traditional Cuisine Perceived a Lactagogue by Batakneses Lactating Women in Simalungun. North Sumatera, Indonesia. *Journal of Human Lactation*, Vol 25: 64-72
- Fink G, Gunther I and Hill K. 2011. The Effect of water and Sanitation on Child Health: Evidence From The demographic and Health Surveys 1986-02007. *International Journal of Epidemiology* Vol 40 (5): 1196-1204
- Gong YY, Egal S, Hounsa A, et al. 2003. Determinant of Aflatoxin Exposure in Young Children from Benin and Togo, West Africa: The Critical Role of Weaning. *International Journal of Epidemiology*, Vol 32 (4): 556 - 562
- Hammers J and Spears D. 2013. Village Sanitation and Children's Human Capital: Evidence From a randomized experiment by the Maharashtra government. *Policy Research Working Paper* No. 6580, World Bank, Washington, DC
- Ismail, R., Manurung, R., Sihotang, D., Munthe, H.M., Tiar, I. 2019. Specialization of Skills and Traditional Treatment Methods by Namalo in Batak Toba Community, Indonesia. *Studies on Ethno-Medicine*, Vol 13(4):207–216
- Johantika, E. 2002. PemanfaatkankangkungDarat (Ipomeareptanspoir) DalampembuatanBiskuit Tinggi Seratmakanan. Skripsi. FakultasTeknologiPertanian IPB. Bogor.
- Machisa M, Wichmann J and Nyasulu PS. 2013. Biomass Fuel Use for Household Cooking in Swaziland: Is there an association with Anemia and Stunting in Children Age 6-36 months? *Transaction of the Royal Societyof Tropical Medicine and Hygiene*, Vol 107 (9): 535-544.
- Mahgoub Salah E.O., Maria Nnyepi, Theodore Bandeke. 2006. Factors Affecting Prevalence of Malnutrition Among Children Under Three Years of Age in Bostwana. *African Journal of Food Agriculture Nutrition and Development*, Vol. 6 (1).
- Manary MJ and Solomons NW. 2009. Public Health Nutrition, Nutrition and Child Development. *Publisher of medical books EGC*. Translation Public Health Nutrition
- Manurung R, Ismail Rizabuana, DaulayHarmona, 2017. Namalo - Traditional Healer in Batak Toba Society, Indonesia: Knowledge of Drug and Traditional Treatment Process. *Man in India* Vol 97 (24): 369-384.
- Nababan Donald, Rizabuana Ismail, EvawaniAritonang, Wirsal Hassan. 2017. Factors Associated with Stunting among Children Aged 0-24 Months inKecupak, Pakpak Bharat District, North Sumatra: a case-control study. *Journal of Research in Ecology*, Vol. 5(2): 820-829.
- Ortiz Johana, John van camp, SylvianaWijaya, SilvanaDonoso. 2014. Determinants of child malnutrition in rural and urban Ecuadorian Highlands. *Journal Public Health Nutrition*, Vol 17 (9): 2122-2130
- PeraturanMenteriKesehatanRepublik Indonesia Nomor 75 Tahun 2013 TentangAngkaKecukupanGizi Yang DianjurkanBagiBangsaIndonesia.<http://www.indonesian-publichealth.com>
- Rahman Azizur, Chowdhury Soma. 2007.Determinant of Chronic Malnutrition among Preschool Children in Bangladesh. *Journal of Biosocial Science*, Vol 39 (2): 161-173
- Rayhan M. Israt, M. Sekander Hayat Khan. 2006. Factors Causing Malnutrition among Under Five Children in Bangladesh. *Pakistan Journal of Nutrition* Vol 5 (6): 558-562.
- Ricci JA and Becker S. 1996. Risk Factors for Wasting and Stunting Among Children in Metro Cebu, Philippines. *The American Journal of Clinical Nutrition* Vol 63 (6): 966-975.
- Sinha RK, Dua R, Bijalwan V, Rohalgi S, Kumar P. 2018. Determinant of Stunting, Wasting, and Underweight in Five High-Burden Pockets of Four Indian States. *Indian Journal of Community Medicine*. Vol 43 (4): 279-283
- Silva P. 2005. Environmental Factors and Children Malnutrition in Ethiopia. *Policy Research Working Paper*; No. 3489. World Bank, Washington, DC
- Shirima CP, Kimanya ME, Routledge MN, Srey C, Kinabo JL, Humpf HU, Wild CP, Tu YK, Gong YY. 2015. A prospective study of growth and biomarkers of exposure to aflatoxin and fumonisins during early childhood in Tanzania. *Journal of Environmental Health Perspective*. Vol. 123 (2): 173-178.

- Shourman B.O, El Morsi D. Shabaan S. 2012 Aflatoxin B1 Level in Relation to Child Feeding and Growth. *Indian Journal of Pediatric*. Vo.1 79 (1): 56-61
- VilcinsDwan, Peter D. Sly, Paul Jagals. 2018. Environment Risk Factors Associated with Child Stunting: A Systematic Review of The Literature. *Annals of Global Health*, Vol 84 (4): 551- 562
- WHO Technical Report Series. 1995. Physical Status: The Use and Interpretation of Anthropometry. Report of World Health Organization Expert Comitee. Available from: http://apps.who.int/iris/bitstream/10665/37003/1/WHO_TRS_854.pdf

Biography

Donal Nababan is a lecturer in Universitas Sari Mutiara, Medan, Indonesia. He teach in Department of Epidemiology.

Rizabuana Ismail was born in Air Batu, Asahan, North Sumatera, Indonesia. He received his bachelor's degree in Anthropology from the Universitas Sumatera Utara, Medan, Indonesia (1985) after attending the transplant program at the Faculty of Letters and the Faculty of Social Sciences at the University of Indonesia, Jakarta (1981-1984). Furthermore, he got Master of Philosophy (M.Phil) in Anthropology and Sociology from Universiti Kebangsaan Malaysia, Bangi, Malaysia (1991) and PhD (Cultural Sociology) from Universiti Malaya, Kuala Lumpur, Malaysia (2008). From 2012 until now, he has been the chairman of Master's of Sociology Program, Universitas Sumatera Utara. He is one of the lecturers who is active in participating in research, writing books and writing several articles published in journals. The focus of his research is sociology of family, sociology of health and sociology of plantation.

Ivana Tiar was born in Jakarta, Indonesia. She obtained her bachelor degree in Chinese Studies from Universitas Indonesia (2013). After she gained some experience for almost a year, she got full scholarship from Confucius Institute and pursued her study in Fudan University, Shanghai, China, and got her master degree of Teaching Chinese to Speakers of Other Languages (2016). Once she got back to Indonesia, she worked at Lembaga Bahasa Internasional, Faculty of Humanities, University of Indonesia as Mandarin tutor (2016-2020) and coordinator of Mandarin Program (2019-2020). Aside from that, she was also actively taught Mandarin as a lecturer in Vocational Program University of Indonesia (2017-2019) and Chinese Language Education Program of Jakarta State University (2018-2020). In August 2020, she made career pivot and dive into Human Resources field at one of the globally successful smartphone companies as Organization and People Development Specialist.