



Iodine Content and Nutrition Worms *Polychaeta* "Laor" Fresh and Processed Products

Matheus Ch.A Latumahina and Meigy Nelce Mailoa*

Department of Fisheries Product Technology, Pattimura University, Ambon-Indonesia
Jl. Mr. Chr. Soplanit Poka-Ambon Telp. (0911) 3825060.

Abstract: Iodine received significant attention from the WHO because it is an essential mineral in the growth and development of the fetus until the child starts school children as well as pregnant and lactating mothers. A good source of iodine is one of the sea food sea food that are usually consumed by the people of Maluku is *Polychaeta* worm called "laor". "Laor" worms product fresh and processed in the dry method of drying Freze and powdered. In this study, there are 3 types of powder worm worm that fresh powder, the powder is a worm that has been cooked and powdered worms "lawar" fermentation or "bakasang". The results showed that levels of iodine in the powder fresh worms amounted to 140.75 g /100 g, product "bakasang", "Laor" of 108.51 g/100 g and "lawar" product of 73.38 g/100 g. This shows that the treatment process greatly affects the availability of iodine in the product processing "Laor". The consumption patterns of pregnant women in the village of Ambon island Alang showed that consumption of the products "lawar" donate respectively 15.77% and 6.51% of the minimum level of dietary iodine for pregnant women is 200 mg / day.

Keywords : Iodine, worms Polychaeta, Laor.

1. Introduction

Iodine received significant attention from the WHO because it is an essential mineral in the growth and development of the fetus until the child starts school children as well as pregnant and lactating mothers. Iodine deficiency is directly related to the intelligence of children, where iodine deficiency causes decreased IQ in children of school children. School children in Indonesia experienced a mild deficiency due to lack of iodine were measured using urine iodine. This is due to inadequate food consumption figures iodine needs of the child. (Classification deficiency of iodine used is the concentration of iodine in urine. Deficiency of weight if the median value of <20 mg / L; moderate if the value of the median urinary 20-49 ug / L; light if the median value of urinary 50 - 99ug / L and normal if the median urine > 100 ug / L (WHO, 2004). With reference to the classification of iodine deficiency above, according Picauly (1999) suggested that pregnant women in Nusa Laut Maluku showed moderate deficiency with the results as follows: severe deficiency of 7.0% ; was 49.1%, mild 26.3% and 17.5% of normal.

Foodstuffs from the sea contains iodine which is quite high by Abdullah et al¹ that the content of iodine in seaweed fresh *Sargassum* 20.70 ug / gram; *Caulerpa* 4.92 ug / g and *Euchema cottonii* 8.40 ug /g. WHO (2004) suggested that iodine deficiency in the fetus causing abortion, stillbirth, congenital hypothyroidism, increased *perinatal mortality* (PNM), kritinisme, deaf mute. Deficiency in neonates will happen neonates goiter, hipotirodisme, mental retardation, enlargement of the thyroid gland. According to Dong et al⁴ that the thyroid hormone plays a role in the early growth and brain development. Furthermore, according to

Zimmerman et al⁹ found moderate to severe iodine deficiency in children generally cause damage to intellectual functioning and motor skills. Population with chronic iodine deficiency causes reduced IQ points between 12.5 to 13.5.

Polychaeta worm or commonly called by the Maluku “*laor*” usually consumed rocky coastal communities and inhabited by the worm is so easy to catch it in case the harvest season. There are two types of dishes that are usually processed by housewives at harvest “*laor*”. “*Laor*” processing normally carried out housewife is “*lawar laor*” that worms are cooked using herbs and roasted coconut and walnut, while the other one is “*bakasang laor*” which is a fermentation product salty sauce stored in a bottle. Utilization of this worm as a good source of iodine for school children as well as pregnant women has not been studied. The purpose of this study is:

1. Calculate how much mineral content of iodine contained in the *Polychaeta* powder worm fresh and processed products.
2. Calculate the contribution of iodine for pregnant women who consume processed products.

2. Research Methods

This study aims to analyze the availability of the iodine content of the “*Powder Laor Fresh*” (BLS), “*Powder Bakasang Laor*” (BBL) and “*Powder Lawar Laor*” (BLL). From the analysis of the levels of iodine will be followed by calculating the contribution of iodine given to pregnant women when consuming processed “*laor*”. Worm fresh sample taken from Alang village on the island of Ambon stored in plastic and wrapped in aluminum foil, then frozen. “*Laor bakasang*” products and “*lawar laor*” taken from the community included plastic-wrapped aluminum foil and frozen. All these products were brought to the laboratory of Food Engineering Faculty of Food Technology, University of Gajah Mada using sterfoam box and given the outpouring of dry ice to maintain the temperature remains low. On arrival at the laboratory incorporated into Freeze dryer (Alpha 1-2 / LD) to be dried. Temperatures were used between -48°C up to -50°C . After sampling the product dry blended and sieved using a 150 mesh size. Samples inserted into aluminum foil and vacuum using supervac GK 113D.

Products included in the bag of aluminum foil to prevent the loss of iodine due to the influence of light and air. Once stored at a low temperature of 5°C and the product is ready to be analyzed levels of iodine and proximate. Iodine levels were measured using a spectrophotometer. Levels of iodine and proximate analyzes carried out in laboratories Nutrition Food And Nutrition Study Center UGM. In this study also conducted surveys consumption patterns worms *Polychaeta* processed from pregnant women were measured in grams / day, which can be calculated the contribution of processed worm iodine consumed by pregnant mothers.

3. Results and Discussion

Research iodine in *Polychaeta* worms that “*Powder Laor Fresh*” (BLS) and their processed products. The processed form of products *Powder Lawar Laor* (BLL) and fermented salt called “*Powder Bakasang Laor*” (BBL) can be seen in Table 1. Sumar and Ismail (1997), suggests that iodine is derived from the Greek word for purple, is an essential nutrient for humans and animals. At the time of the emperor Chen in China iodine is used to treat goiter by eating seaweed, marine animals and sponge rich in mineral iodine. According to Winarno (1990) red seaweed iodine levels ranged from 0.1 to 0.15 g / 100 g dry matter.

Processed products	The Measured parameters (g%)					
	Water content (dry weight)	Protein	Fat	Ash	Carbohydrate	Iodine ($\mu\text{g/g}$)
<i>Powder Laor Fresh</i> (BLS)	5.80 ± 0.32	66.34 ± 4.46	6.50 ± 0.98	9.83 ± 1.94	11.85	140.75 ± 5.29
Powder Laor Bakasang (BBL)	6.36 ± 0.33	69.69 ± 5.68	6.73 ± 0.83	9.78 ± 2.22	7.82	108.51 ± 3.34
<i>Powder Lawar Laor</i> (BLL)	15.35 ± 1.32	49.75 ± 5.72	23.32 ± 3.73	6.90 ± 1.50	6.72	73.38 ± 3.75

The highest levels of iodine found in “*Powder Laor Fresh*” (BLS) that is equal to 140.75 g / 100 g, followed by fermentation products “*Powder Bakasang Laor*” (BBL) 108.51 g/100 g and products “*Powder Lawar Laor*” (BLL) of 73.38 g/100 g. This shows that the treatment process is very influential on the availability of iodine levels in the product worms *Polychaeta* “Laor”.

According Cahyadi (2006), the stability of iodine in salt is influenced by several things including temperature, retention time, the type of packaging and light. During storage “*Powder Laor Fresh*” (BLS) uses clear plastic bottles are translucent and stored at room temperature about 28 - 30°C during the month decreased levels of iodine are drastic. Iodine lost during storage by 68%, it is necessary to protect against loss of iodine content in the powder worms “laor”. Treatment process for pressed powder lost through cooling the worm is using freeze drying method. Once dry blended products in a cold room and the powder is stored in bags of aluminum foil to prevent opaque to the product and do the vacuum process and stored in the refrigerator. This process has been done and can reduce the deficit levels of iodine in the powder worms fresh during storage for a month. During the storage time of iodine levels decreased from 140.75 g to 135.40 g / 100 g of material.

Effect of temperature and how to process lead to decreased availability of iodine in the product “*Powder Lawar Laor*”. When compared to the levels of iodine in “*powder laor fresh*” with a powder content of iodine in the event of loss “*lawar laor*” iodine content of 47.87%. In the fermentation process “*powder bakasang laor*” decreased levels of iodine by 22.91%. Effect of processing on nutritional value of “*powder laor fresh*” compared to the natural fermentation products not clicking significant change, for the parameters of moisture, protein, fat and ash content. The real difference was seen between BLS and BLL where all the parameters that were analyzed showed significant differences. BLS moisture content and product BLL 15:35 5.80 g% as well as the fat content of the product BLS at 6:50 and BLL products have the high fat content of 23:32 g%. Increased levels of fat due to the addition of fatty materials such as toasted coconut and walnuts are added as an ingredient. Coconut is added as much as 20% and walnuts as much as 10% of the weight of fresh “*laor*”. This is the trigger increased levels of fat in the product “*lawar laor*” changes the protein content of the BLS from 66.34% to 49.75 mg% after processed into BLL, ash content also decreased after than 9.83 g% in fresh worms to 6 , 90 g% after processed into “*lawar laor*”.

Consumption Pattern picture worms *Polychaeta* (*Laor*) On Pregnant Women

In this study, there are two refined product that is “*bakasang laor*” and “*lawar laor*” commonly consumed by people of the island of Ambon and surrounding areas, public consumption taken as a sample of pregnant women in the village of Ambon Island Alang were eating habits and “*bakasang laor*, “*lawar laor*”. “*Lawar*” eating habits and “*bakasang laor*” can be calculated percentage of iodine were donated from worms refined products to the needs of pregnant women to the fetus growth.

“*Lawar*” consumption patterns and “*bakasang laor*” in pregnant women in the village of Alang as follows for lawar usually consumed an average of 215 ± 31.42 g / day, while “*bakasang*” by 64 ± 9.61 g / day. “*Bakasang*” which is the result of fermentation of this worm, a thick paste product and if it was about to be consumed is added chopped onion and chili. Consumption patterns such as chili sauce eaten with tubers or boiled bananas are dipped into the sauce “*bakasang*”. While “*lawar*” usually eaten with rice or tubers.

An overview of the consumption patterns can be calculated levels of iodine donation of products “*bakasang*” and “*lawar*”. The cooling process by using freeze drying methods cause both products “*lawar*” and “*bakasang*” shrinkage to 20%. So iodine donation of products “*lawar laor*” of large numbers adequacy 15.77% of the number of pregnant women with iodine needs an average of 200 mg / day, while “*bakasang*” donate iodine for pregnant women 6.51%. Iodine is necessary for pregnant women, if the mother's iodine deficiency it will be disrupted formation of hormones T3 and T4 so that the growth and development of the fetus in the womb also be hampered. Not enough hormones are supplied to the fetus of pregnant women pregnant would cause the child to be born prematurely, be born dead, the child becomes a midget and impaired intellectual ability (Ares et al.)². From this statement, the consumption of worms *Polychaeta* is a good source of iodine for the mother during pregnancy.

4. Conclusion

Best iodine content of “*powder laor fresh*” that has freeze drying of 140.75 g / 100 g. Influence of processing greatly affect the nutritional composition of the product “*laor*”. “*Laor lawar*” product has all the nutritional parameters were low except for the fat content is higher than “*bakasang*” products and fresh worms. “*Laor lawar*” consumption will contribute 15.77% of pregnant women iodine sufficiency while “*bakasang*” donate 6.51%.

References

1. Abdullah N, J.Genisa; R. Syukur dan M.Latumahina. 1998. Studi Pengembangan Menu Kaya Iodin Dengan Substitusi Rumput Laut Dan Analisis Daya Terima. Direktur Jenderal Pendidikan Tinggi. Departemen Pendidikan Dan Kebudayaan. Hibah Bersaing Bidang Kesehatan Dan Gizi Masyarakat. CHN-III.Project. IRBD LOAN No. 3550.IND.
2. Ares S. Jose Quero, J.M. de Escobar. 2008. Iodine Balance, Lactogenic and Thyroid Dysfunction in Premature Newbornes. Elsevier Inc.
3. Cahyadi W. 2006. Penentuan Konsentrasi Laju Penurunan Kadar Iodat Dalam Garam Beriodium. Jurnal Teknologi Dan Industri Pangan Vol XVII No.1. Fakultas Teknologi Pertanian. Institut Pertanian Bogor. Hal 38 – 43.
4. Dong J. Yin H ., W.Liu., P.Wang., Y.Jiang., J. Chen. 2005. Congenital Iodine Deficiency and Hypotirodism Impair LTP and Decrease *C-fos* and *C-jun* Expression in Rat Hippocampus. NeuroToxicology 26 : 417 – 426.
5. Picauly I. 1999. Kebiasaan Pengolahan Pangan, Konsumsi Pangan Dan Status Yodium Ibu Hamil Di Daerah Endemik GAKI Kecamatan Saparua, Maluku Tengah. Tesis. Program Pascasarjana. Institut Pertanian Bogor.
6. Sumar S. and H.Ismail.1977. Iodin In Food and Health. Nutrition and Food Sciene. 5 : pp – 183.
7. WHO. 2004. Iodine Status Worldwide. WHO Global Database on Iodine Deficiency. World Health Organization. Geneva.
8. Winarno F.G. 1990. Teknologi Pengelolaan Rumput Laut. Penerbit Pustaka Sinar Harapan. Jakarta.
9. Zimmerman M.B., Pieter Joste., C.S. Pandav. 2008. Iodine Deficiency Disorder. www.thelancet.com Vol.372.
