

## The Use Flour Bones of Fish Skipjack ( *Katsuwonus Pelamis L* ) By Boiling It Naoh On The Model Mice Ovariektomi

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**ABSTRACT:** Waste management from home industries in North Moluccas optimal done so make the impact less well on the environment, while the waste can be processed further into a variety of products having economic value. This study attempts to find out the uses of flour bones of fish skipjack by boiling it NaOH on the model mice ovariektomi. Methods used is the method his experiments with uses the media boiling bones of fish skipjack use NaOH while to test in vivo use the Lab rats. Parameter that analyzed in order to characteristic physical; degree is white, absorption capacity water and the density of the camba while chemical characteristic of flour a bone of a fish skipjack consisting of the water level, ashes, fat, protein, calcium, phosphorus, sodium, magnesium, vitamin D and solubility. The results of the analysis physical flour bones of fish skipjack but boiling NaOH following; 0.92, 62.31, 97.06. The results of the analysis chemical flour bones of fish skipjack but boiling NaOH consisting of the Ca, P, Mg, Na and vitamin d respectively is; 26.56, 0.78, 0.48, 1.84 and 4.6 while level of solubility respectively is; 0.04 , 0.07 , 0.39 and 0.08. Test results in vivo on the day zero, 15 and 30 to value Ca and P in the blood serum mice respectively following; 49.08, 29.23; 51.59 , 31.92; 55.17 and 29.23 mg/dL.

**Key words:** Waste bones of fish skipjack, boiling NaOH, model mice ovariektomi

### I. INTRODUCTION

Waste a bone of a fish skipjack from year to year will keep improving so that pose a problem for the environment because caused strong't feeling well, " it is acknowledged a company by processing fishery products but technology to process the waste to more expensive compared with the result that was obtained. See the phenomenon so arising idea to make use of waste bones of fish skipjack who had not valuable be more valuable into technology and processing that simple does not cause negative effect on the environment. Waste bones of fish it has the mineral content high as suitable material as a source of calcium natural (Malde *et al.* 2010).

The waste from skulls and scales having the mineral content especially calcium and which phosphorus substantial (Kaya *et al.*, 2008). The high the mineral content of flour bones of fish, the material also very suitable as a source of calcium natural in food products, fodder or as a supplement. The utilization of waste bones of fish skipjack during this new used as as a mixture of fodder and there is not yet the food companies who use it as a supplement in the form of minerals to in the product.

A bone of a fish skipjack having the mineral content especially calcium and phosphorus are high but bones of fish having fat content and high protein. Fat and a protein on a bone of a fish skipjack to be reduced because they disturb metabolic processes in the body.

Fat in a bone of a fish being in the form of fat simple, namely triglycerides of fatty acids. Fat this simple placed in neutral fats. This type of fat can hydrolyzed if heated in lye. One effort to remove grease or to minimize fat in a bone of a fish is by using an acid Soeparno dan Susana, 1984). Boiling bone using NaOH having the highest score on all of the parameters of because they are capable of degrades proteins and fats compared with the use of other material.

A bone of a fish skipjack without done reduction proteins and fats usually causing bad smell rancid and assumed disrupt the process of metabolism in the body so that the product of food consumed containing calcium and phosphorus might be bound so that could cause osteoporosis.

Osteoporosis is a disease of bone have the properties of typical of mass the low, accompanied micro architecture the and decrease in the quality of bone tissue which could result in vulnerability bone (Alexander and Karla, 2010).

Various sources above relation to osteoporosis so appear the idea of do research by the title "The use of flour bones of fish skipjack by boiling it NaOH on the model mice ovariektomi".

## II. MATERIALS AND METHODS

The raw material used in making flour bones of fish skipjack were the wet obtained from the market hygenis in Ternate North Moluccas.

Chemical materials used for the manufacture of flour bone fish is  $H_2SO_4$ , alkohol, NaOH,  $Na_2S_2O_3$ ,  $HNO_3$ ,  $HClO_4$ , akuades, tablet kjeltab, buffer pH 7 dan pH 4,  $KH_2PO_4$  (standar fosfor), Saline solutionCa 1000 ppm (standar Ca) (AOAC, 1995).

The tools used for the manufacture of flour a bone of a fish tray madidihang, a knife, a pan, a stove, an oven, an autoclave, disc mill, sieve100 mesh and they believe that the scales analytic .

For analysis physical and chemical used an oven, the balance analytic, squash measures, squash kjeldhal, water bath, homogenizer Nissei AM-3, AAS (*Atomic Absorpstion Spectrophotometer*) merk Shimadzu AA-680, *Rheoner* merk RE 3350 Yamaden, Poselin cup, filter paper, *Whiteness meter* merk Kett Electric C-100-3, a measuring glass, erlenmeyer, instrument soxhlet, cotton fat-free, pipet, an electric cooker, furnace, pH meters, a funnel, a measuring glass, paper strain Whatman 42 and the tube reaction sentrifuse (AOAC, 1995 ).

## III. METHOD

### Boiling a bone of a fish skipjack (*Katsuwonus pelamis L* ) with NaOH

A bone of a fish skipjack obtained from the market hygen in Ternate City.Process of making flour bones of fish skipjack started from waste bones of fish the length of which is between as 30-45 cm, small size the average 10-15 cm.Next phase is laundering of dirt and blood attached, followed by boiling .

Boiling done 3 times , four hoursstepsfor 12 hours with the temperature  $100^{\circ}C$ .After boiling the first phase the washed back in running water and boiled back with the same temperature was done for 3 stage.Stage next one is treatment boiling bones of fish by concentration of the NaOH 1: 3 b/v to the time boiling for the next 40 minutes.

After boiling bones of fish washed three times to clean and in autoclave for two hours with the temperature  $121^{\circ}C$  next dioven with the temperature  $60^{\circ}C$  for eight hours, the next process done pengggilangan with disc mill and sifted with size 100 mesh ( modification method Thalib *et al.*, 2009 ) .

### Parameter observed

Characteristic of fisiko-kimia flour bones of fish madidihang observed is covering degrees white; absorption capacity water (Fardiaz *et al.*, 1992 and the density of the kamba (Wirakartakusumah *et al.*, 1992), while characteristic of chemical observed covering levels of calcium, phosphorus, sodium, magnesium, vitamin d (Raitz *et al.*, 1987), to solubilitas calcium and phosphorus uses the method (Santoso *et al.*, 2006 ), while for analysis in the blood serum mice covering; levels of calcium, phosphorus, sodium, magnesium and vitamin d ( Raitz *et al.*,1987) .

## IV. RESULT AND DISCUSSION

### The physical characteristics bone fish flour skipjack (*Katsuwonus pelamis L*)

Characteristic of physical flour the skipjack (*Katsuwonus pelamis L*)done boiling NaOH can be presented in Table 1.

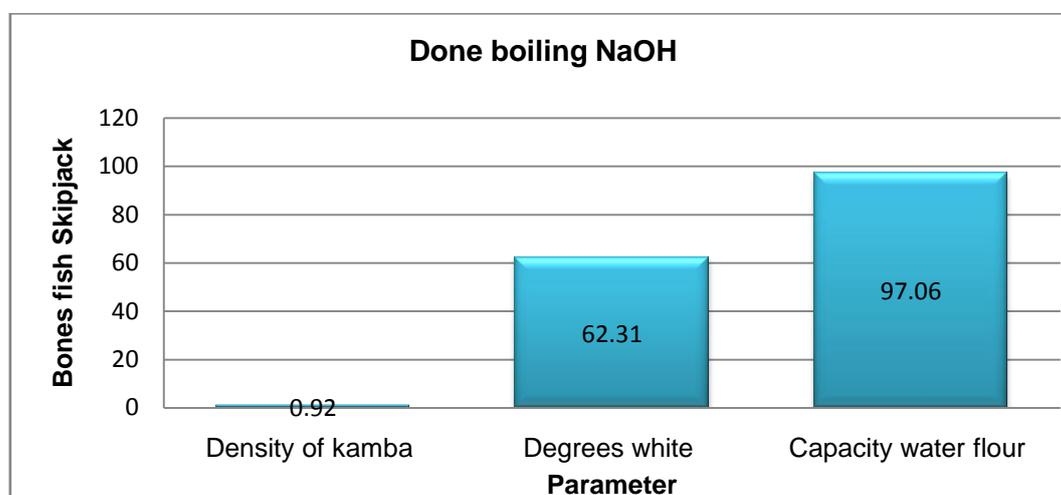


Figure 1. Characteristics physico-chemical flour a bone of a fish skipjack

The results of the analysis the density of kamba (bulk density) bones fish skipjack but boiling NaOH with the 0.96 g/ml while for analysis degrees white flour bones of fish skipjack produced by using NaOH 62.3% and for parameter absorption capacity water flour bones of fish skipjack produced by boiling NaOH 97.06, is presented in Figure 1 .

Three parameters mentioned above compared to previous studies with flour the same bone but by using a kind of boiling different namely by acetic acid and lime so method boiling by using NaOH having results more best and statistically markedly dissimilar ( $p < 0,05$ ).

It is probably caused by the material used, NaOH is a kind of on is relatively weak acids strong capable of degrades fat and protein more than a kind of other (Talib *et al.*, 2014).

### Characteristic of chemical flour a bone of a fish skipjack (*Katsuwonus pelamis L*)

The results of the chemical analysis of flour a bone of a fish skipjack with medium boiling NaOH can be presented in figure 2.

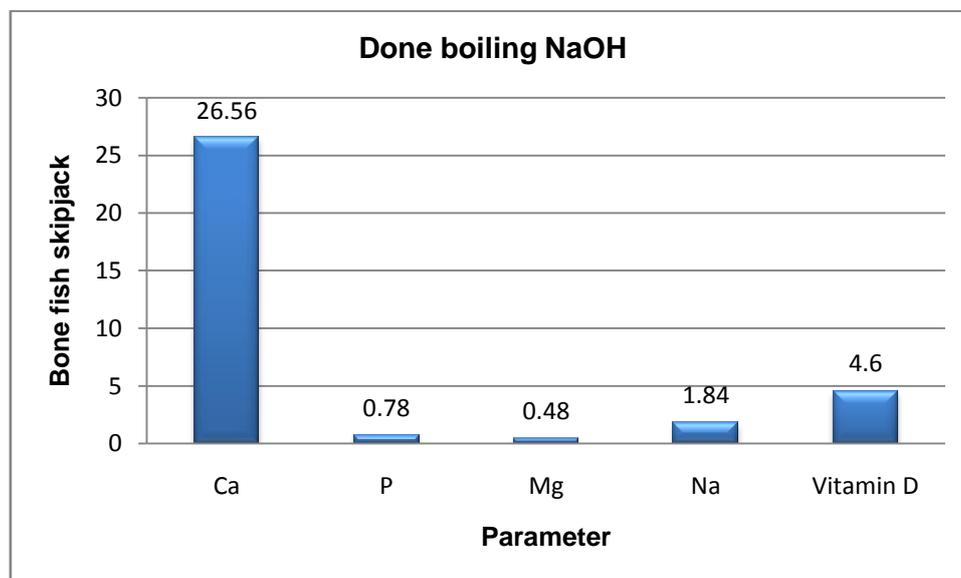


Figure 2.Characteristic of chemical flour bones of fish skipjack

The results of the analysis calcium content on flour bones of fish skipjack by the boiling NaOH is 26.56 mg/g bk.

The result of this research compared to previous studies uses the media boiling acetic acid and lime, boiling by using NaOH has a higher value, this along with research Trilaksani *et al.*, 2006 with the methods hydrolysis on the fish skipjack having value 23,72-39,24 mg/g bk .

The high bones of fish in addition to being influenced by the media boiling different , was also affected by the raw material used including factors ecological at the time that is the arrest, the availability of nutrients, temperature and salinity(Martinez *et al.*, 1989 ).Calcium is macro of a very important molecule in growth and development bone and of teeth (Harris and Karnas, 1989)

Phosphorus had an important role in in the process muscular contraction, on establishing a bone (ossification ) and activity sekretoris (Piliang, 2006 ).

The womb phosphorus in the research by media boiling NaOH is 0.78 mg/g bk.This outcome compared to research (Trilakasani *et al.*, 2006) by the method hydrolysis is 11,34-14,25 mg/g bk value more high.The high value caused by the process boiling different.A ratio of between Ca and P influential closely in the process absorption

Phosphorus is second largest makromineral who were in the body after calcium, 85% phosphorus contained in the bones.Calcium and phosphorus forming calcium phosphate or calcium krsital hidroksiapatit [ $3Ca_3(P_04)_2Ca(OH)_2$ ] as the major composer the framer of a bone (Sabri, 2011 ) .

Parameter analysis magnesium content on flour bones of fish skipjack by the boiling NaOH with the highest is 0.48 mg/g bk.The result of this research compared to previous studies with the use of acid acetic and lime, with uses the media boiling NaOH the result more good.This is caused by a kind of boiling used because NaOH is the type of material that can be shrink fat and protein, the lower fat and protein so to increase the number of mineral on the material.

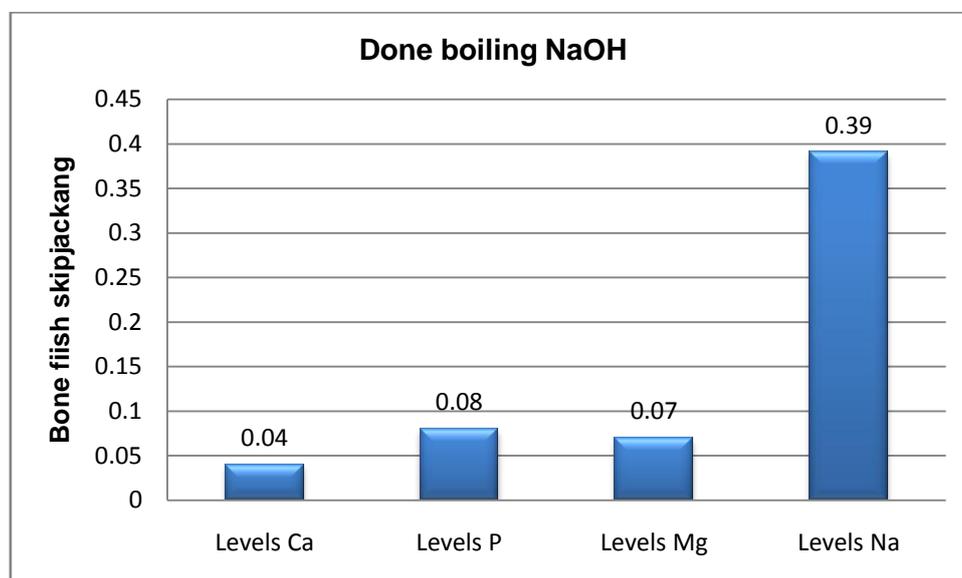
Magnesia in body are on a bone around 60% which crystallizes and of the crystal hydrated (Linder, 2006 )  
The rest of magnesium especially in the form of the cells of software that its major function likely to stabilize the structure of ATP (adenonin triphosphat) in the body .Magnesium also played a role in tarnsmisi and activity in neuromuscular , in line or contrary to pangaruh calcium (Hubbard, 1969 in Linder, 2006 ) .  
Membrane plasma including membrane oxon takes energy to who actively to transfer sodium of intracellular to extracellular (Linder, 2006 ).To maintain a balance pressure osmose across the cell membrane, then there will be more many ions divalent in a cell by the particles intracellular to compensate elektrolit-elektrolit monovalent more in extracellular.

Vitamin D content on bone fish flour skipjack with media is boiling NaOH 4.6 mg/g bk.Vitamin d helps in the formation of bone, teeth and other soft tissue .According (Brody, 1999) that vitamin d metabolism is physiologically have leverage the remodelling bone mechanism .

Deficiency or infusiensi vitamin D will influence on the remodelling the bone, who in end up creating pathological on a bone (osteoporosis primary).Vitamin d had a role in regulating various protein bone 1.25 (OH)<sub>2</sub> D3 indirectly increase mineralisasi the through an increase in the concentration calcium and phosphate due to absorption calcium and phosphate through (Hikmat, 2004 ) .

### **Characteristic of solubiltas flour bonesof fish skipjack(Katsuwonus pelamis L)**

The results of the analysis solubilitas mineral flour bones of fish skipjack can be present in Figure 3 .



**Figure 3. Solubility Ca, P, Mg and Na fish bones flour of fish skipjack**

The results of the analysis solubility mineral flour bones of fish skipjack by the boiling NaOH to levels Ca is 26.56%.According to Master (1979) in Nabil (2005) that the water level products relating to the solubility. The higher the water level products, increasingly difficult products they dissolved in water, that production tending to form granules is greater (Nabil 2005).

The results of the study before about solubilitas ca and p flour bones of fish skipjack by the boiling different namely by media boiling acetic acid , hydrochloric acid and water the results increased significantly as increased degrees acidity where the value of solubilitas highest produced at pH 4 with media boiling water (Talibet al., 2009).

The results of value solubilitas mg (magenesium) flour bones of fish skipjack by the boiling NaOH is 0.48%.This outcome compared to research before about solubilitas magnesium flour bones of fish skipjack by boiling it lime and acetic acid the this research lower.

Solubilitas na (sodium) flour bones of fish skipjack by the boiling NaOH is 1.48 %.This value compared to previous studies by the boiling acetic acid and lime the this research is higher (Talibet al., 2014).

### **The in vivo in mice attempt to Ca and P blood serum mice**

Treatment test in vivo by using a rat trial period during 30 days experiment showed that with treat pemberin doses flour bones of fish skipjack (*Katsuwonus pelamis L*) but boiling NaOH for parameter analysis ca in the blood serum mice shown in Table 1.

Table 1. Test in vivo with the lab rats for 30 days for parameter ca and p blood serum

Treatment	Ca blood serum (mg/dL)	Pblood serum (mg/dL)
0	49.08±10.9	29.23 ± 5.9
15	51.59±11.8	31.92 ± 2.8
30	55.17±9.3	40.23 ± 25.5

Information: The figures on the same line which is followed the letter superscripts different ( a , b , c ) shows the results of markedly dissimilar (P< 0.05).

Therapy flour a bone of a fish with a dose of skipjack 0,500 , 1000 and 1500 mg BB per day done for 30 days treatment. Based on the results of that is listed in Table 1 on the day to (0, 15 and 30 ) on flour treatment bone NaOH to 4 namely doses 0, 500 , 1000 and 1500 mg / g BB per day who received scores of raw is ca on the day of the 30<sup>th</sup> 55,17 mg /dL while the lowest is in day ke-0 49,08 mg/dL.

Statistically different real (p<0,05) on ke-0,15and 30 day. This along with research (Talib *et al.*, 2014) that the provision of supplements of calcium from the bones of fish with high doses can affect the repair process histopatologik picture on a bone vertebræ mice ovariektomi

Levels of calcium normal in blood plasma is 8,5-10,4 mg / dL. Ca blood levels 45 % bound by protein plasma terutama albumin and 10 % bound by dapar anion as citric and phosphate (Setyorini *et al.*, 2009).

Standard Ca normal in plasma is 8,5-10,4 mg/dL thus compared to this research, so the results have not been in accordance with established standards. This is because to research this use animal experiments with model mice ovariektomi

The absorption ca intestinal and high akskresi ca through the kidney because the decline in 1.25 dihidroksivitamin D<sub>3</sub> in the blood (Meacham *et al.*, 1995).

The measurement of the serum of blood to the parameters of phosphorus with therapeutic doses decker 0, 500, 1000 and 1500 mg/g BB per day. The results of highest with therapy flour a bone of a fish in a dose of skipjack 1500 mg / g bb per day with a value of 40,23 mg/dL and the lowest is calcium carbonate 29,23 mg/dL .

The high phosphorus in blood serum in a dose of 1500 mg/g BB per day. This is because a bone of a fish flour skipjack containing phosphorus which is quite high, so that the higher therapy a dose which is used so it can increase levels of p in the blood serum. Result of measuring phosphorus in the blood serum with a dose of 0,500, 1000 and 1500 mg/g BB per day, statistically markedly dissimilar (p<0,05).

Level of phosphorus (P) inorganic both of which are abundant after calcium. Phosphorus will accumulate in bone as many as 85 percent, source of phosphorus that most were derived from milk, meat, eggs, fish, nuts and bones of fish. Although classified as nutrients essential, excess levels of phosphorus in the body to be injurious to the bone. Elevated levels of phosphorus in serum will increase the secretion of parathyroid hormone causing and bone resorption (Illich kerstetter , 2000 in *et al.*, Noor, 2011).

#### Test in vivo on the lab rats to mg and na blood serum mice

The results of the chemical analysis of flour a bone of a fish skipjack to the parameters of mg and na blood serum mice is presented in Table 2.

Table 2 . Test in vivo with the lab rats for 30 days to the parameters of Mg and Na blood serum

Treatment	Cablood serum (mg/dL)	Nablood serum (mg/dL)
0	39.67 ± 12.9	1561.05 ± 297.8
15	25.61 ± 12.6	1743.79 ± 366.8
30	56.34 ± 91.6	1733.16 ± 378.04

Information: The figures on the same line which is followed the letter superscripts different ( a , b , c ) shows the results of markedly dissimilar (P< 0.05).

Mineral on the blood serum mice needed very few, but very important to perfection of food consumed especially mineral magnesium and sodium. Based on in activities life, mineral divided into two parties that is mineral essential and minerals non essential .

Mineral essential that is a mineral is required in physiological processes living things to help a working enzyme or the formation of organs. While mineral nonessential is metal its role in the living body unknown and her womb in network is very small. If her womb height could rupture the the living body concerned lead poisoning, metal also can cause disease deficiency mineral (McDonald *et al.*, 1988: Inoue *et al.*, 2002).

## V. SUMMARY

1. Characteristic fisiko-kimia flour a bone of a fish skipjack the highest in boiling a bone of a fish skipjack 30th in the day

2.To assay in vivo using a rat experiment that has the highest score on at the 30<sup>th</sup> day a dose of 1500 mg per kilogram BB per day.

## VI. SUGGESTION

Advice needs to be done advanced research for purification ca and p on the fish skipjack and followed by test toxicity and enkapsulasi in the lab rats.

## VII. ACKNOWLEDGMENTS

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