



## **Analysis of the Use of Various Types of Fuel and Smoking Room Temperaturevalue of Nutrition and Organoleptic Smoke Carp (*Cyprinus carpio* sp.)**

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**Abstract :** This study aims to determine the influence of various types smoke fuel on smoked carp with different temperatures to the nutritional value of smoked carp as well as the level of panelist acceptance of smoked carp fish. The tool used in this research is smoke cabinet. While the material used consists of carp as much as 60 head, coconut shell 13 kg, sawdust, 32 kg, 6.5 kg salt kitchen. The data collected consisted of data of proximate test and organoleptic test. Proximate test parameters were protein content, fat content analysis, ash content analysis and carbohydrate analysis. While on organoleptic testing using the sense of sight, sense of smell, sense of touch, and sense of taste. Data analysis used is descriptive analysis. The results showed that based on the results of proximate test on smoked carp fish produced in research with different treatment of fuel and suhub sources found the lowest water content in treatment A of 70.1%, the highest protein content in treatment C of 19.35% , the highest fat content in the C treatment was 2.92% and the lowest ash content in treatment B was 9.47%. Furthermore, the result of organizational test of panelist's favorite on color, aroma, texture and taste shows the best treatment is D treatment that is the treatment of curing fish with temperature 65-70oC with coconut shell fuel.

**Keywords :** *Smoked fish, carp, smoke, coconut shell, temperature.*

### **Introduction**

In Indonesia, traditional fish processing done by the fishermen and his family along the beach where the fish landing by means of inherited hereditary processing. Traditionally processed fish products have a wide spread distribution because in general the product is relatively stable although durable and packaging very simple (Heruwati, 2002).

Fish is one source of animal protein widely consumed by the public, easy to get, and the price is cheap. Fish contains many organic and inorganic elements, which is useful for humans. However, fish also quickly experience the process of decay after being arrested and dead. Fish needs to be handled properly in order to remain in a condition worth consuming by the community. The fish were not preserved only feasible to be consumed within a day after being caught. Various ways of durable of fish has been done, but most of them were not able to maintain the properties of natural fish. One way to preserve fish which does not change the

nature of the fish are cooling and freezing. Fish durable traditionally aims to reduce water content in fish body, so it does not provide the opportunity for bacteria to breed (Mareta & Awami, 2011).

Smoking is a way of preservation/fish processing using smoke which comes from the burning of charcoal or coconut shell, coconut husk, sawdust or rice husks. In this case the smoke contains compounds which have durable properties, such as phenol compounds, formaldehyde and others (Anonymous, 2011). The smoke formed by the incomplete combustion, ie burning with a limited amount of oxygen. Smoking is done with purpose: 1). To durable fish (mostly done in countries that have not developed by utilizing natural materials in the form of abundant wood and cheap), 2). To give a distinctive taste and smell (Murniyati, 2000). Actually the smoke itself is very limited preservative power (which depends on the duration and thickness of the smoke), so that the fish can be durable, smoke should be combined with other preservation methods, for example, storage at low temperatures. According to estimates FAO, 2% of the world's fish catch durable by smoke, whereas in tropical countries number reached 30% (Anonymous, 2007).

Smoking can be done in two ways, ie cold smoking, and hot smoking. The temperature used for hot fumes is quite high so that fish meat to mature. Durability of hot smoked fish, caused by salt, smoke and heat. While in cold smoked fish, caused by salt, acid and drying.

### **Purpose**

This research aims to determine the influence of different types of smoke fuel on smoked carp with different temperatures to the nutritional value of smoked carp and the effects of various types of fuel smoking in the smoked carp with a range of different temperatures the level of acceptance of panelists.

### **Method**

#### **Time and Place**

This research was conducted on May-November 2017 in the Laboratory of Agricultural Technology Education Study Program and proximate test done in Chemistry laboratory of State Agricultural Polytechnic of Pangkep.

#### **Equipment and Materials**

Tool used in this research is a smoke closet. While the materials used consisted of carp as many as 60 fish, coconut shell 13 kg, sawdust 32 kg, salt kitchen 6,5 kg.

#### **Procedures:**

- Used carp obtained from fish farmers comes from Sinjai regency of South Sulawesi
- Carp are handled and washed thoroughly
- Carp weighed as much as 540 g and added as much salt 20% (108 g)
- Store carp that have been sprinkled with salt, then put in a container bucket for 1 hour
- After that, carp is dipped with clean water so that the dirt and salt out of the fish body
- Insert carp into the smoke cabinets according to treatment namely smoke treatment with coconut shell with two treatments ie temperature 60 and 65°C, likewise with sawdust also smoked each with temperature 60 and 65°C. Each treatment consisted of three replications.
- Carp smoked for 4 hours and after it was appointed and cooled to further ready for organoleptic test.

#### **Data collection**

The data collected consists of data of proximate test and organoleptic test. Proximate conducted test parameters are protein content analysis, fat, ash and carbohydrate. While on organoleptic testing which is a subjective assessment using the sense of sight, the sense of smell, sense of touch, and sense of taste. The result of sensory assessment then analyzed statistically so that the results of the assessment are not subjective so the data obtained becomes valid or trustworthy.

## Data analysis

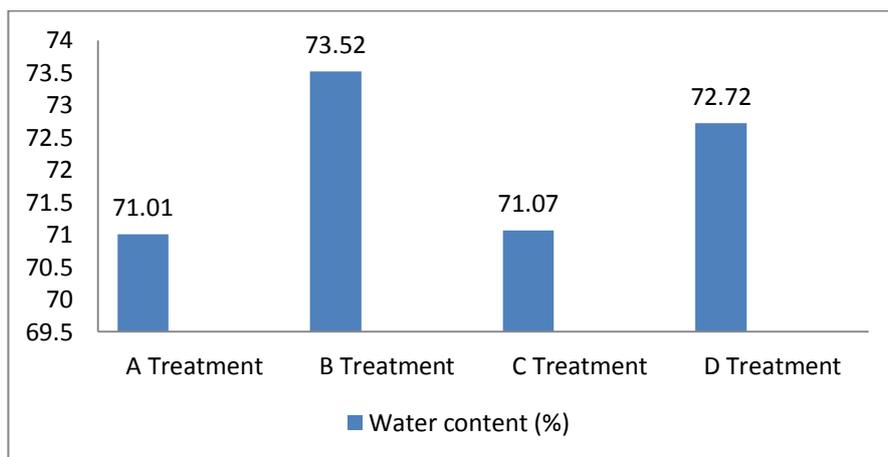
Data analysis used in this research is descriptive analysis.

## Results and Discussion

### Proximate Test

#### Water content

Result of water content analysis shows the range of water content of smoked fish produced in the research were in the range of 70,1-73,52% with the lowest water content is in A treatment of 70,01%, following C treatment 71,07, D treatment 72,72% and highest on B treatment 73,52% (Figure 1).



**Figure 1. Water Content of Smoke Carp**

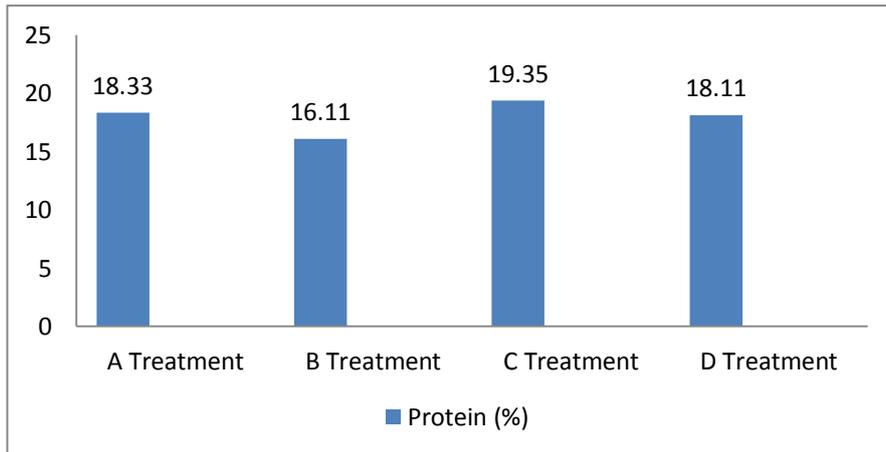
#### Protein

Fish are living creatures that have high protein around 20%, which is very good for the human body and relatively cheap price. Protein itself is a major part of the arrangement (composition) the human body. Protein in fish is useful for (Mareta & Awami, 2011):

- Accelerate body growth (both the height and weight).
- Increase endurance.
- Make intelligent brain.
- Increase generation/good offspring .

In addition, the protein contained in the fish has a good quality, because it contains little cholesterol (a substance that can cause high blood pressure disease) and less fat (Mareta & Awami, 2011).

The results showed protein content of smoked fish produced during the research is in range 16,11-19,35% with the highest protein content C obtained in the treatment of 19,35%, following A treatment 18,33%, D treatment 18,1% and lowest on B treatment 16,11% (Figure 2).

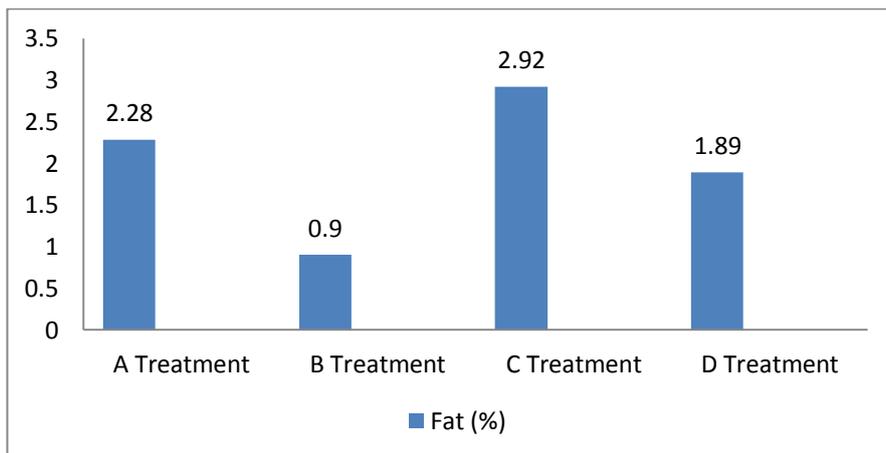


**Figure 2. Protein Content of Smoke Carp**

Results of research conducted by Prasetyo *et al.* (2015) which conducts research on the influence of temperature and duration of smoke to the quality of milkfish (*Chanos chanos* Forsk) smoke remove the thorns, show protein content of smoked fish increased at 1 hour and 2 hours then decreased at 3 hours of smoke. While in this research smoke carried out constant during 2.5 hours for all treatments. This is due to the increase in nitrogen content as a component of amino acids in line with the loss of hydrogen due to the heating element. However, the longer the heating can damage the protein (Mao L and Wu Tao, 2008). The heating causes the structure of the denatured protein, accumulated and became a simpler form. A simpler form of protein make the protein unstable and easy to change in other conditions (Georgiev *et al.*, 2008). The research Akintola, S.L. (2014), shows that smoke significant effect on the increase in macro-nutrient especially protein at *Penaeus notialis* (65,76% on raw materials and 67,00% in the smoked sample).

### Fat

The results showed fat content of smoked fish produced in this research is in range 0,90-2,92% with the highest fat content is in C treatment 2,92%, following A treatment 2,28%, D treatment 1,89 and lowest on B treatment 0,9% (Figure 3). According to Prasetyo *et al.* (2015), Smoking can also increase fat level on a smoked ingredient.



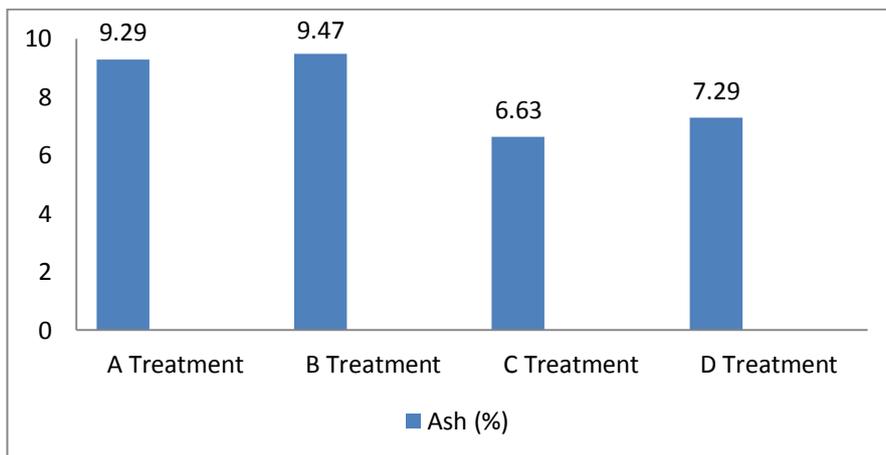
**Figure 3. Fat Content of Smoke Carp**

The research Yanar *et al.* (2006) showed that the fat content of smoked tilapia (*Oreochromis niloticus*) without the addition of salt increases 0,2% from 2,64% on fresh fish to be 3,14% after being smoked. Increased fat content of smoked fish can be influenced by intrinsic and extrinsic factors of condition of raw materials used, milkfish classified as fish with high fat content (>4%) whereas extrinsic factors can be caused by heat and

attachment of liquid smoke components which can react with enzymes in fish tissues making a warning of the rate of change in fat content (Stolyhwo & Sikorski, 2005).

### Ash

The results showed ash content of smoked fish carp is in range 6,63-9,47% with the value of the highest ash content in B treatment 9,47%, following A treatment 9,29%, D treatment 7,29% and the lowest on C treatment 6,63% (Figure 4). Determination of ash content aims to assess mineral content in food, whether still available or not because as a parameter of nutritional value of food (Prasetyo *et al.*, 2015)

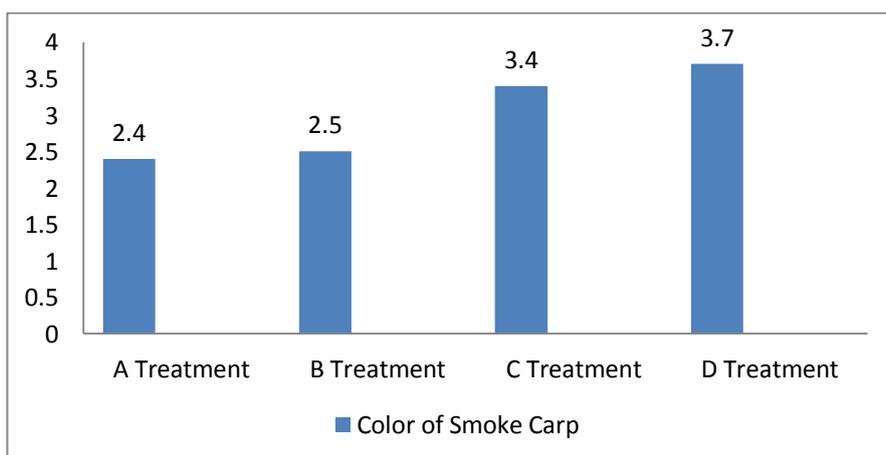


**Figure 4. Ash Content of Smoke Carp**

### Organoleptic Test

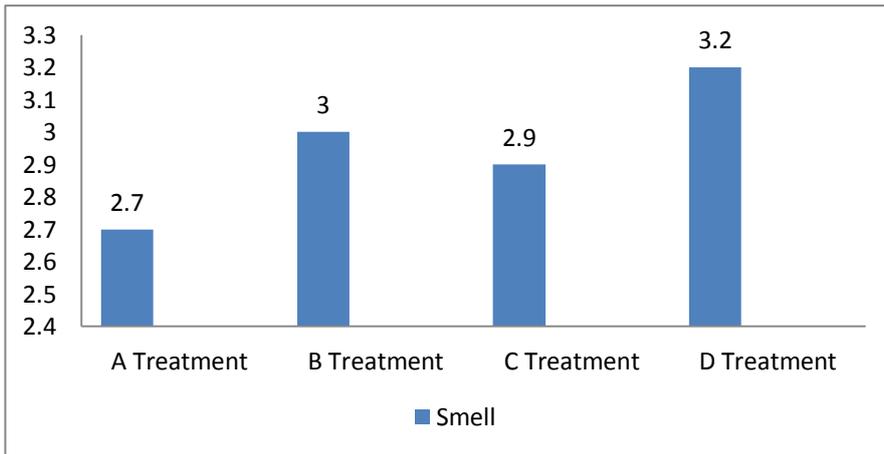
#### Color

Organoleptic test results on color parameter of smoked fish of carp which resulted in the research shows the value range 2,4-3,7 with the highest value on D treatment 3,7; following C treatment 3,4; B treatment 2,5 and the lowest on A treatment 2,4 (Figure 5). The results of this research still lower than the results of research conducted by Mareta & Awami (2011) which finds the value of organoleptic color test results 3,8.



**Figure 5. Color of Smoke Carp**

Result of organoleptic test on smell parameter Smoke Carp which resulted in the research shows the value of the range 2,7-3,2 with the highest value lies in D treatment 3,2; following B treatment 3,0; C treatment 2,9; and the lowest on A treatment 2,7 (Figure 6). The results of organoleptic test of smell in this research still lower than stated by Mareta & Awami (2011) who found the value of smell organoleptic test results of 3,2.

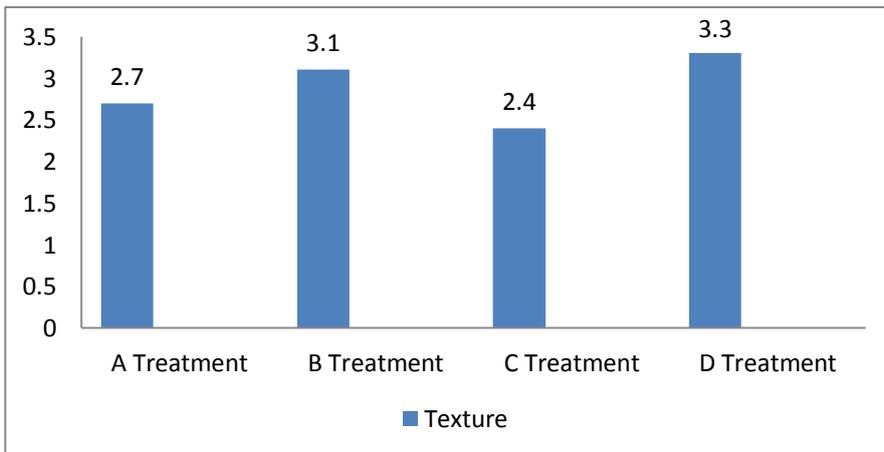


**Figure 6. Smell of Smoke Carp**

**Texture**

Result of organoleptic test on texture parameter of Smoke Carp which resulted in the research shows the value range 2,4-3,3 with the highest values in D treatment 3,3; following B treatment 3,1; A treatment 2,7 and the lowest on C treatment 2,4 (Figure 7).

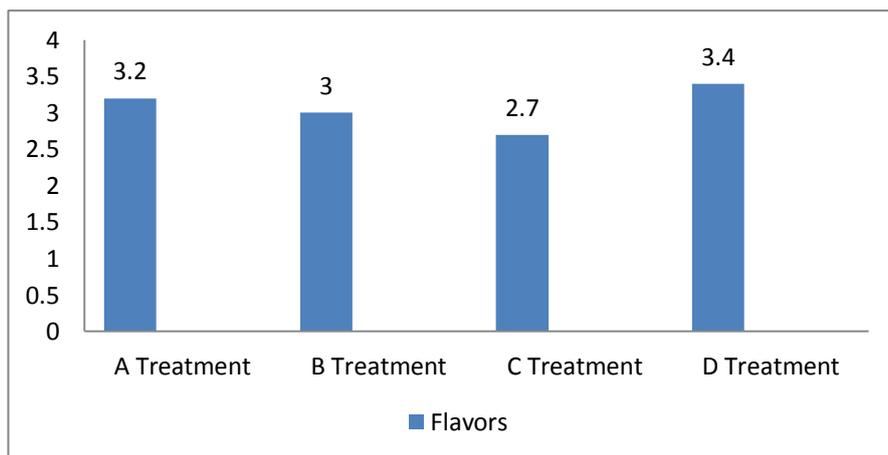
Result of organoleptic test of texture in this research still higher than that found by Mareta & Awami (2011) which finds the value of organoleptic test results texture only 3,2.



**Figure 7. Texture of Smoke Carp**

**Flavors**

Organoleptic test result parameter flavors smoke carp which resulted in the research shows the value range 2,7-3,4 with flavors values smoke carp. The highest was in D treatment 3,4; following A treatment A 3,2; B treatment 3 and lowest on C treatment 2,7 (Figure 8). Organoleptic flavors test results in this research is still lower than the results of research Mareta & Awami (2011) who found the value of organoleptic flavors test results of 3,9.



**Figure 8. Flavors of Smoke Carp**

## Conclusion

Based on the results of the research, then it can be conclude die proximate test results to smoke carp with various fuel source treatments found the lowest water content on A treatment 70,1%, highest protein content at C treatment 19,35%, highest fat content at C treatment 2,92% and the lowest ash content at treatment B 9,47%. Furthermore, organoleptic test results panelist's sense of color, smell, texture and flavor shows the best treatment is the D treatment ie treatment of smoke fish with temperature 65-70°C with coconut shell fuel.

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