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PROCEEDINGS

"EDUCATIONAL CHALLENGES AND STRATEGIES OF HIGHER EDUCATION IN HEALTH ACHIEVEMENT OF SDGS 2030"

Hotel Damhil UNG, Gorontalo City, Sept 27th 2017

BOOK 3

SUSTAINABLE DEVELOPMENT GOALS

PUBLIC HEALTH DEPARTMENT
SPORT AND HEALTH FACULTY
GORONTALO STATE UNIVERSITY

THIRD INTERNATIONAL SEMINAR ON PUBLIC HEALTH AND EDUCATION (ISPHE) PROCEEDINGS

Public Health Department, Sport and Health Faculty, Gorontalo State University

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PREFACE

Assalamu'alaikum warrahmatullahi wabarakatuh

Firstly, may we made our highest praise and thank to Allah The Almighty, for His bless so what we are able to conduct such an precious moment; Third International Seminar on Public Health and Education 2017 in Gorontalo Indonesia, to share our knowledge and ideas with so much warm and friendship from worldwide public health and education community.

International Seminar on Public Health and Education 2017 is aimed to gather all of experts, researchers, academiciansand practitioners in health education field in general as well as national and international level in one prestigious academic forum which to discuss all health-education-related issues, ranging from human resources, curriculum, institusionalization ect. The seminar also proposed to contribute to the focus of health development direction; by considering also situation and the status of local health condition from each region, both national and regional levels as well as its relation to global health trends.

I would like to deliver our highest respect and appreciation to our honorable speakers, Dr. Jihane Tawilah (WHO Indonesia Representative), Prof. Dr. dr. Oktia Woro K.H.,M.Kes (Keynote Speaker from Semarang State University), Febi Dwirahmadi, SKM, MSc.PH, PhD (Centre of Environment and Population Health School of Medicine, Griffith University, Australia), Prof. Kraichat Tantrakarnapa (Mahidol University), and Dr. Kukiat Tudpor, PhD (Mahasarakham University). I really expect that this seminar will be beneficial for all of us and to the development of the Public Health and Education field.

Allow me to express my gratitude to the participants and audiences from Indonesia and other foreign countries who are enthusiastic in attending this seminar. I do hope that all audiences will gain important values and collaborate it into our fields and make significant changes in the future. Besides that, I also

convey my appreciation to all of organizing committee who has given their outstanding commitment for presenting this occasion.

Wassalamu’alaikum warrahmatullahi wabarakatuh

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ORAL PRESENTATIONS

IDENTIFICATION OF BACTERI RACING AND NUTRITION CONTENT IN Pindang TUNA FISH FOR SALE IN TRADITIONAL MARKET CIAWI DISTRICT TASIKMALAYA

Dian Saraswati[1)] and Ai Sri Kosnayani[1)]
[1)] Faculty of Health Sciense, Siliwangi University

ABSTRACT

The main obstacle in the marketing of fresh tuna is a short durability due to bacterial Pseudomanas, E coli, Salmonella, Klebsiella, Enterobacter, Proteus and Yersinia decomposition. Diseases caused when the bacteria enter the human body such as fever, abdominal pain and diarrhea. Preparation of tuna fish is one of the food processing efforts in order to preserve, increase digestibility, and flavor enhancer, but food processing can also affect nutritional value. The purpose of this research is to know the existence of bacteria and macro nutrient content pindang tuna fish that sold in Ciawi traditional market. The research used descriptive method through laboratory test of bacteria test, biochemical test (motile test, Methyl-Red, Voges-Proskauer, TSIA, KIA, simon citrate and carbohydrate fermentation test) for six samples and three replications. The results showed that in pindang tuna bacteria Pseudomanas aureginosa, E. coli, Salmonella tyhpi was negative. Analysis of macro nutrients found carbohydrate and fat content in tuna pindang higher but the protein content is lower than fresh tuna.

Keywords: pindang tuna, bacteria, carbohydrat, protein, lipid

PRACTICAL STATEMENT

Seeing the results of bacterial identification in boiled tuna negative, then the way cob boiled fish production in Ciawi market can be developed in terms of hygiene health. Should be examined about the causes decreased levels of protein and fat content sizeable increase. Do sharing between merchants boiled tuna to improve the quality of boiled tuna particularly the levels of nutrients, because each trader has its own advantages.

INTRODUCTION

Tuna is a food source of protein that is consumed by Tasikmalaya community. As a source of tuna fish protein is a functional food that has significance for health because it contains long-chain saturated fatty acids (especially those classified as fatty acid ω3), vitamins and macro and micro molecul (Heruwati, ES 2002). Fresh tuna fish has a chemical composition consisting of 69.40% water, 1.5% fat, 25% protein, 2.25% ash, and 0.03% carbohydrate (Sanger, 2010). Bacteria and chemical changes in eye fish cause decay (Hiariey, S. and Lekahena, V. 2015) and compared with other foodstuffs, fish more quickly decompose (Mardiana, et al., 2014). Tuna cultivation by way of pemindangan is one alternative to maintain the quality of tuna fish.

In the area of West Java, including Tasikmalaya pindang outstanding common fish market is boiled fish boiled milk and tuna fish. Cob boiled fish is quite popular in the community because it is quite easy to do. How to make boiled fish is very simple, namely the process of added salt and then boiled. How to fish spoilage caused by boiling water from well water, cooking water is used repeatedly until fresh fish runs out or to wait for the next boiling process tuna left at room temperature.

Once the manufacturing process is completed followed by the marketing process, commonly marketed in traditional markets, if not sold in one day on selling to the next morning without adequate storage. This situation will affect the quality and safety of boiled tuna produced, in terms of quality mikrobiologisnya and bacterial content. Research results of Widiastuti, I. (2005) found that pindang fish with 40% salt content in 6 days storage of TPC value is still below the safe limit, if more than 6 days of boiled tuna fish is not feasible to be consumed.

The process of decay boiled tuna fish is caused by bacteria (Pseudomanas, E coli, Salmonella, Klebsiella, Enterobacte, Proteus and Yersinia), in the decay process occurs also the reduction of nutrients at the boiled tuna.

According to the Indonesian National Standard (DG Fisheries 1994/1995), quality standards are not boiled fish or negative bacteria. Macro-nutrients contained in boiled tuna can be classified into three groups: carbohydrates, protein and fat. Protein is a compound that can be damaged if heated too long and changes in pH.

In traditional markets Ciawi Tasikmalaya district there are 6 fish traders boiled cobs spread in the market, boiled tuna in the market is made by the vendors themselves, but the fish cob from the same manufacturer. From this background, we will make a study entitled Identification of Spoilage Bacteria and Nutritional content at the cob Pindang fish Circulating In Traditional Markets Ciawi Tasikmalaya Regency.

RESEARCH METHODS

Tools and Materials

The tool used in this research is autoclave, stirring rod, erlenmeyer, durham tube, incubator 37^0C, electric stove, digital scales, bunsen burner, dispo1 ml, test tube, glass chemical, oven, volume measuring cup100 cm^3 and 10 cm^3, spatula, ose needle, vortex and petri dish (ϕ 100 mm).

The materials used in this research are six samples of pindang tuna fish, XLDA (Xylose Laktose Dextrose Agar), Ceta (Cetrimide Agar), MCA (Mac Conkey Agar), aquades, NA (Nutrient Agar) for Semisolid, Triple Sugar Iron Agar TSIA), Simmon Citrate Agar (SCA), NaCl (Sodium Cloride), lactose, sucrose, glucose, Methyl Red - Voges Proskauer (MR-VP), Bacto Peptone, Phenol Red, KIA (Iron Kigler agar), Selenite Cystine Broth (SCB), Lactose Broth (LB), KOH, alphanaphthol, alluminium foil and cotton.

Methods

The method used in this research is descriptive method. Laboratory tests include testing of bacteria, biochemical tests include tests motile, test methyl-Red, Voges-Proskauer test, test TSIA, KIA test, test and test simon citrate fermentation of carbohydrates (glucose, lactose, sucrose).

Specific medium used is XLDA for Salmonella typi, CETA for Pseudomanas auruginosa and MCA for E coli, a medium for biochemical tests are NA semisolid, TSIA, KIA, lactose, glucose, sucrose, Mr simon-Vp and citrate. The first medium used is a pre-enrichment medium is Lactose Broth.While the analysis of the content of the test using the macro nutrients carbohydrates, fats and proteins.

RESULTS

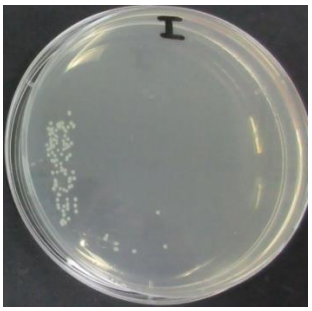
The results of the research in this study is divided into two, namely the results of microbiological and nutritional value of the macro, microbiology results can be seen in Table 1 below.

Table 1 Average Results Spoilage Bacteria Pindang Tuna Fish (in 3 replicates)

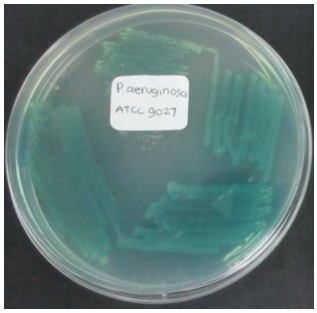
No	Bakteria	Result of number sample					
		1	2	3	4	5	6
1	*Escherichia coli*	-/negative	-/negative	-/negative	-/negative	-/negative	-/negative
2	*Salmonella typhi*	-/negative	-/negative	-/negative	-/negative	-/negative	-/negative
3	*Pseudomonas aeruginosa*	-/negative	-/negative	-/negative	-/negative	-/negative	-/negative

From the results of laboratory tests on all samples negative bacterium *Escherichia coli, Salmonella typhi and Peudomonas aeruginosa*. This means that in six cob pindang fish samples there are three such spoilage bacteria.

In the visible image control (+) contained Pseudomonas aeruginosa bacteria growth while the samples no growth of bacteria *Pseudomonas aeruginosas*. When these bacteria were grown in specific media, these bacteria will produce a bluish pigment nonfluoresen, piosianin. Some strains of *Pseudomonas* are also able to produce a green fluorescent pigment, namely pioverdin. Can be seen in Figure 1 the control (+) greenish. While the sample no discoloration.



Sample



Control (+) *Pseudomonas aeruginosa*

Figure 1. Growth in Media CETA, specific for *Pseudomonas aeruginosa* (Media Cetrimide Agar)

In the test IMViC (Indol- Methyl Red, Vogeus Proskauer, citrate and TSIA) Pseudomonas aeruginosa, microorganisms capable of using citric acid will then be removed from the culture medium, thereby causing an increase in pH and change the color of the medium from green to blue in the control (+), can be seen in Figure 2 below.

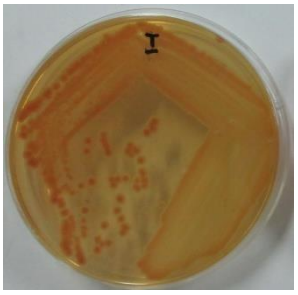
IMViC test results for sample

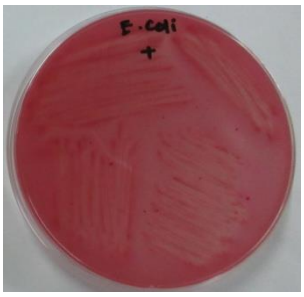
test results IMViC to control (+)

Figure 2. Test IMViC *Pseudomonas aeruginosa*

To test Escherichia coli can be seen in Figure 3 using a specific media MCA (Media Mac Conkey Agar) can be seen in the control (+) colonies were, sorrel, methalik, smooth, keeping or slightly convex. While the sample no

discoloration so negative Escherichia coli.

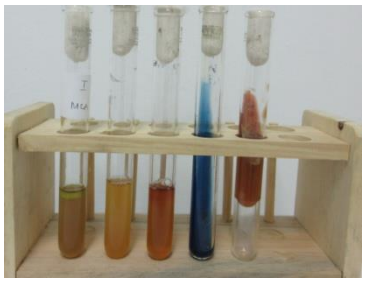


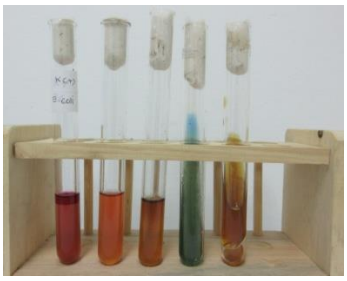


Sample Control (+) *E.coli*

Figure 3. Growth in Media MCA, specific for *Escherichia coli*

In the test IMViC (Indol- Methyl Red, Vogeus Proskauer, citrate and TSIA) *Escherichia coli*, microorganisms capable of using citric acid will then be removed from the culture medium, thereby causing an increase in pH and change the color of the medium from green to blue in the control (+).

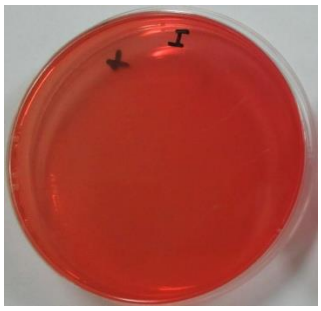




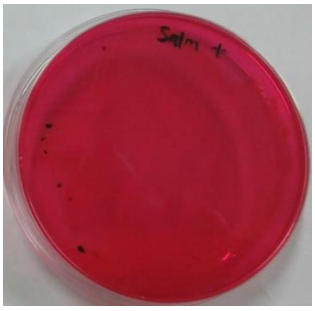
IMViC test results for sample test results IMViC to control (+)

Figure 4. Test IMViC *Escherichia coli*

In the test using *Salmonella typhi* XLDA specific media (Media Xylose Lactose Dextrose Agar) bacterial colonies of pink with polka black spot in the middle can be seen in Figure 5.



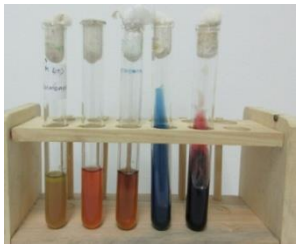
Sample



Control (+) *Salmonella typhi*

Figure 5. Growth in Media XLDA, for *Salmonella specific typhi*

In the test IMViC (Indol- Methyl Red, Vogeus Proskauer, citrate and TSIA) *Salmonella typhi* can be seen in Figure 6. *Salmonella typhi* only positive there urease test. Urease enzyme will outline the urea into ammonia. Urease test showed a positive result if the color changes from yellow to red to purple. Urease test results negatively if the color changes from yellow to red to purple.



IMViC test results for sample test results IMViC to control (+)

Figure 6. Test IMViC *Salmonella typhi*

While the results of research into two is a macro nutrient content can be seen in table 2:

Table 2. Average Test Results Carbohydrate, Fat and Protein Content Analysis (g/100g)
(in 3 replicates)

No. of Sample	Carbohydrate	Fat	Protein
1	7,93	14,80	7,53
2	6,96	6,68	3,60
3	3,84	4,76	1,93
4	13,16	1,58	6,97
5	6,84	2,20	3,84
6	9,12	2,18	7,19

From the results of the average carbohydrate content analysis above shows that the highest is number 4 while the lowest was number 3, of the average fat

content seen the highest levels of fat is the number 1 and the smallest is number 4 and of the average protein content seen the highest protein content analysis of protein content is number 6 and the lowest sample is number 3.

DISCUSSION RESEARCH

From the results of laboratory tests an average of 3 replicates to six samples were negative bacterium *Escherichia coli, Salmonella typhi* and *Peudomonas aeruginosa.* This is caused from the sale of a relatively clean environment as an example image 7 below:

Figure 7. Clean and healthy traders

The second thing is all pindang tuna fish traders produce 2 times a week so no fish boiled cobs were stored over 4 days. This is consistent with research of Widiastuti, I. (2005) states that the fish boiled with salt levels of 40% on a 6 day storage TPC value is still below safe limits. The results of this study also did not exceed the threshold of the Indonesian National Standard.

From the results of this study fish boiled cobs that are in the market Ciawi Tasikmalaya regency still secure consumed, next to the nutrient content of fish boiled cobs are as follows.

Table 3 Comparison of macro nutrient content of substances in fresh and pindang fish tuna (*Euthynnus affinis*)

No.	Macro Nutrient Content of Substance (g/100gram)			
	Nutrient	Fresh Tuna Fish	Pindang Tuna Fish	
1.	Carbohydrat	3,00	Sampel 1	7,93
			Sampel 2	6,96
			Sampel 3	3,84
			Sampel 4	13,16
			Sampel 5	6,84
			Sampel 6	9,12
2.	Protein	25	Sampel 1	7,53
			Sampel 2	3,60
			Sampel 3	1,93

			Sampel 4	6,97
			Sampel 5	3,84
			Sampel 6	7,19
3.	Fat	1,5	Sampel 1	14,80
			Sampel 2	6,68
			Sampel 3	4,76
			Sampel 4	1,58
			Sampel 5	2,20

Carbohydrate Analysis

Carbohydrates play an important role in determining the characteristics of food ingredients such as color and texture. The carbohydrate content is influenced by factors other nutrient content (Winarno 2008). Carbohydrates are widely present in vegetable materials, in the form of simple sugars, hexoses, pentoses, and high molecular weight carbohydrates such as starch, pectin, cellulose, and lignin. Animals convert vegetable carbohydrates into animal carbohydrates consisting mainly of glycogen. (Basari, ME., 2007).Carbohydrate content in the boiled tuna highest is 4 samples, closest to the carbohydrate content of fresh tuna is a sample 3. Change the value of the average carbohydrate levels occur due to changes in other nutritional components such as fats and proteins during the cooking process and storage.

However, increased levels of carbohydrate in the boiled tuna will not be a bad effect on health will only add calories produced.

Protein Analysis

The protein content in boiled tuna is much smaller than the fresh tuna fish and this is because the protein susceptible to denaturation caused by heating for too long and adding extra salt. Based on the results of interviews with traders boiled tuna, swordfish boiled cooking ranges between 6-7 hours. The protein content of boiled tuna decreased from fresh tuna fish. The increase in nitrogen content as a component of amino acids consistent with the loss of hydrogen due to the heating element. The longer heating can damage proteins (Maodan Tao 2008).

The heating causes the denatured protein structure, and coagulated into a simpler form. A simplified form of the protein makes the protein is unstable and easily changed on other conditions (Georgiev et al. 2008 and Swastawati et al. 2012). Denatured proteins will undergo coagulation when heated at a temperature of 50ºC or more (Ghozali et al. 2004).

Salt is used in addition to adding flavor boiled tuna also for preservation, because one of the functions of salt is a preservative.

Fat Analysis

Fat is one of the macro nutrient required by the body but should be limited because it is associated with blood lipid levels (cholesterol and triglycerides) that trigger the onset of various diseases. Increased levels of fat boiled tuna fish can be

affected by factors intrinsic and extrinsic conditions of the raw materials used. Extrinsic factors caused by heat can react with enzymes in fish tissue makes fat levels increase in the rate of change (Stolyhwo and Sikorski 2005).Changes in the macro-nutrient content pindang tunny is not a reason not to consume boiled tuna, especially for people who are away from the coast because of the difficulty of getting fresh tuna. Consumption of boiled tuna can be used as an alternative to the benefits swordfish pretty much like:

a. Lowering cholesterol, omega-3 content in tuna contribute to reduce the buildup of cholesterol in the body
b. Overcoming anemia, a natural ingredient in the tuna is excellent for stimulating red blood cell formation. Anemia bias swordfish overcome by boiling, and eaten by consuming the broth all at once. If through a process pengorengan, some kind of protein in it is lost
c. tackle dull, swordfish is also beneficial for skin problems in certain parts such as legs, knees, arms and elbows often feels rough and dull. The content of vitamin A and vitamin E in the tuna's useful to refine and brightened the skin.

CONCLUSIONS AND SUGGESTION

Conclusions

Sknot Boiled tuna sold in traditional market Ciawi not contain spoilage bacteria such as *Escherichia coli, Salmonella typhi* and *Pseudomonas aeruginosa*. Nutrient content of carbohydrates and fat boiled tuna sold in traditional market Ciawi increased while the protein content decreased compared with the nutrient content of fresh tuna.

Suggestion

Seeing the results of bacterial identification in boiled tuna negative, then the way cob boiled fish production in Ciawi market can be developed in terms of hygiene health. Should be examined about the causes decreased levels of protein and fat content sizeable increase. Do sharing between merchants boiled tuna to improve the quality of boiled tuna particularly the levels of nutrients, because each trader has its own advantages.

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