2014

China-Japan-Korea and Southeast Asia
Joint Symposium on

ADVANCED PROCESSING TECHNOLOGY & SAFETY CONTROL of AQUATIC PRODUCTS

Programs & Abstracts

Organized by

China Society of Fisheries

Ocean University of China

Supported by

Asian Fisheries Society

Co-organized by

Qingdao Better Biotechnology Co., Ltd

Qingdao • China

May 12th - 14th

Agenda-2014 China-Japan-Korea and Southeast Asia Joint Symposium

From xiaotingfu

To kongzl, cyshiau, b0090, chunju, Victor Lin, tychen, Tristan Liu, awnleung, csxu, nancy.1983, ???, youjinj, 21cow, ???, ???, ???, ???, ffispmr, ffisjtn, ffisjum 11 more...

Cc Xiaoting Fu

Date Thu 19:50

Priority Normal

Message 5 of 218 < >

- Agenda-2014 China-Japan...Asia Joint Symposium.pdf

Dear Colleagues,

It is our great honor for your attendance of 2014 China-Japan-Korea and Southeast Asia Joint Symposium.

The agenda is for your information. Any question please do not hesitate to contact us.

See you in Qingdao!

Best regards,

Sincerely,

Xiaoting Fu

Xiaoting Fu, Ph.D., Associate Professor
College of Food Science and Engineering
Ocean University of China

Agenda

May 12th (Monday)

Lobby, Huanghai Hotel

13:00-18:00	Registration

May 13th (Tuesday) Morning

Opening Ceremony & Forum I – Plenary Reports

Conference Center – Front Hall, Huanghai Hotel **English**

Time	Speeches	Speakers	Chairman
8:30-8:50	Opening Ceremony		**Changhu Xue** Ocean University of China
8:50-9:25	Fish bone weakening technology by electromagnetic irradiation	**Minoru Sato** Tohoku University	
9:25-10:00	Sonodynamically antibacterial activity of hypocrellin B against *staphylococcus aureus*	**Albert Wingnang Leung** The Chinese University of Hong Kong	
10:00-10:15	**Tea Break**		
10:15-10:50	Efficient extraction and characterization of microalgal bioactive compounds	**Sang Moo Kim** Gangneung-Wonju National University	**Minoru Sato** Tohoku University
10:50-11:25	Brown algae extracts improve reproductive function of male rats with strepzotocin-nicotiamine induced diabetes	**Zwe-Ling Kong** National Taiwan Ocean University	
11:25-12:00	The wastes processing of fisheries industry in Indonesia	**YS Darmanto** Diponegoro University, Indonesia	
12:00-13:00	**Lunch**		

May 13th (Tuesday) Afternoon

Forum II - Nutrition and Bioactivities of Aquatic Products

Conference Center – Back Hall, Huanghai Hotel **English**

Time	Speeches	Speakers	Chairman
13:30-13:55	Bioactive peptides isolated from protein hydrolysates of mackerel (*Scomber austriasicus*)	**Chyuan-Yuan Shiau** National Taiwan Ocean University	**Guo-Jane Tsai** National Taiwan Ocean University **QiukuanWang** Dalian Ocean University
13:55-14:20	Purification, characterization, cDNA cloning and *in vitro* expression of a serine proteinase from the intestinal tract of sea cucumber (*Stichopus japonicus*) with collagen degradation activity	**Minjie Cao** JiMei University	
14:20-14:45	Sonodynamically antibacterial activity of curcumin against *Bacillus cereus*	**Chuanshan Xu** The Chinese University of Hong Kong	
14:45-15:10	Studies on the antioxidant activity of abalone (*Haliotis Discus Hannai Ino*) viscera polysaccharide in human hepatoma (HepG2) cells	**Jinquan Chen** Fujian Agriculture and Forestry University	
15:10-15:35	Design of highly sensitive fluorescent probe prepared from acyclic threoninol	**Hiroyuki Asanuma** Nagoya University	
15:35-15:50	**Break**		
15:50-16:15	Structural characterization of *costaria costata* fucoidan and its effect on CCl_4-induced liver injury with comparison to those from *Saccarina japonica*	**QiukuanWang** Dalian Ocean University	**Jianrong Li** Bohai University **Hiroyuki Asanuma** Nagoya University
16:15-16:40	Purification and determination of bioactive peptide from flounder fish (*Paralichthys olivaceus*) using digestive proteases	**You-Jin Jeon** Jeju National University	
16:40-17:05	Anti-cancer effects of epoxy metabolites of docosahexaenoic acid (DHA)	**Hang Xiao** University of Massachusetts	
17:05-17:30	Squid ink polysaccharide stimulates sIgA secretion by promoting IgA and pIgR synthesis to protect intestinal immunity from chemotherapeutic injury	**Qingjuan Tang** Ocean University of China	
17:30-17:55	Characterization, structural identification and proteolytic effects of the hatching Enzyme from starfish *Asterias amurensis*	**Zhijiang Li** Heilongjiang Bayi Agricultural University	
18:30-19:30	**Dinner**		

May 13th (Tuesday) Afternoon

Forum III – Development of Aquatic Products Processing in China

No. 2 Conference Room, Huanghai Hotel **Chinese**

Time	Speeches	Speakers	Chairman
13:30-13:50	Fermentation of surimi with *Actinomucor elegans* using a traditional solid-state fermentation technique 固态发酵生产新型鱼糜制品技术研究	**Yuting Ding 丁玉庭** Zhejiang University of Technology	**Chaohua Zhang 章超桦** Guangdong Ocean University
13:50-14:10	Development of dense phase carbon dioxide in preservation and processing of shrimp 高密度 CO_2 在对虾保鲜与加工中的应用	**Shucheng Liu 刘书成** Guangdong Ocean University	
14:10-14:25	Efficacy of ozonized-slurry ice in keeping quality of bighead croaker (*Collichthys niveatus*) 流化冰对梅鱼保鲜效果的研究	**Jing Chen 陈静** Zhejiang Ocean University	
14:25-14:45	Selection of aptamers targeting marine biotoxins and their application in detection 贝类毒素核酸适配体的筛选及其检测应用	**Zhouping Wang 王周平** Jiangnan University	
14:45-15:05	Quality changes and freshness prediction of freshwater fish during storage 淡水鱼贮藏过程品质变化与预测技术	**Yongkang Luo 罗永康** China Agricultural University	**Shaotong Jiang 姜绍通** Hefei University of Technology
15:05-15:25	Study on the refrigeration, sterilization and preservation of fish filet using ecological electrochemically processed water 生态电化水冻结、灭菌、保鲜淡水鱼片研究	**Zongwen Wu 吴宗文** TongWei Co., Ltd.	
15:25-15:45	Research development of aquatic products quantity and safety group within Guangdong Ocean University 广东海洋大学水产品质量与安全团队研究进展	**Lijun Sun 孙力军** Guangdong Ocean University	
15:45-15:55	**Break**		

Time	Speeches	Speakers	Chairman
15:55-16:15	Regulatory effects of sialyglycoprotein from fish eggs on bone formation and bone resorption 鱼卵唾液酸糖蛋白对骨生成和骨吸收的调控作用	**Jingfeng Wang 王静凤** Ocean University of China	**Yuting Ding** **丁玉庭** Zhejiang University of Technology
16:15-16:35	Processing status and development trend of salted-dried fish 腌干鱼制品的加工现状与发展趋势	**Yanyan Wu 吴燕燕** South China Sea Fisheries Institute	
16:35-16:50	Influence of different treatment on content of fluorine in Antarctic krill 不同加工方式对南极磷虾体内氟含量的影响	**Wenzheng Shi 施文正** Shanghai Ocean University	
16:50-17:05	Effect of slurry ice treatment on the functional properties of the protein in Skipjack tuna 鲜活水产品致病微生物安全控制及流化冰保鲜技术研究	**Bin Zhang 张宾** Zhejiang Ocean University	
17:05-17:20	Effect of pH-shifting process on the ' molecular structure and functionalities of myofibril from silver carp 白鲢鱼 pH-shifting 鱼糜功能特性研究	**Xiangjin Fu 付湘晋** Central South University of Forestry and Technology	
17:20-17:35	Extraction and bioactive study of phospholipids from skipjack brain 鲣鱼鱼脑中磷脂的提取及活性研究	**Hang Lu 卢航** Dalian Ocean University	**Xichang Wang** **王锡昌** Shanghai Ocean University
17:35-17:50	Effects of acrolein oxidization on the muscle microstructure and the myofibrillar protein structure and properties in large yellow croaker (*Pseudosciaena crocea*) 丙烯醛氧化对大黄鱼肌肉组织和肌原纤维蛋白结构性质的影响	**Xuepeng Li 李学鹏** Bohai University	
17:50-18:05	Fermentation and bioconversion of shrimp head wastes for the production of bioactive materials 微生物发酵转化虾头生成活性物质的研究	**Xiangzhao Mao 毛相朝** Ocean University of China	
18:05-18:15	Industrial production of chondroitin sulfate 硫酸软骨素的产业化生产	**Qingli Yang 杨庆利** Qingdao Better Biotechnology Company	
18:30-19:00	**Dinner**		

May 14th (Wednesday) Morning

Forum IV –Advanced Processing Technology of Aquatic Products

Conference Center – Back Hall, Huanghai Hotel **English**

Time	Speeches	Speakers	Chairman
8:30-8:55	Application of high pressure for the mitigation of novel process contaminants in canned fish in the scope of the EU-Prometheus project	**Francisco J. Morales** Spanish National Reseach Council	**Zwe-Ling Kong** National Taiwan Ocean University
8:55-9:20	Sensitive and specific amplification of DNA fragments in the presence of massive background DNA	**Xingguo Liang** Ocean University of China	
9:20-9:45	Nutrient value content daphnia magna mass-cultured for larvae rearing in fish aquaculture	**Vivi Endar Herawati** Diponegoro University, Indonesia	**YS Darmanto** Diponegoro University, Indonesia
9:45-10:10	Recovery and properties of tilapia protein isolation (surimi) by high intensity ultrasonic aided alkaline solubilization /precipitation processing	**Zhiwei Zhu** South China University of Technology	
10:10-10:25	**Break**		
10:25-10:50	Study on the properties and applications of collagen from jellyfish (*Cyanea nozakii Kishinouye*)	**Rui Duan** Huaihai Institute of Technology	**Francisco J. Morales** Spanish National Reseach Council
10:50-11:15	Effect of preservation methods on the physicochemical properties and microstructures of snakehead fillets	**Yaqin Hu** Zhejiang University	
11:15-11:40	Optimum hydrolyzed fish belly for producing canned fish soup and its aroma components	**Juta Mookdasanit** Kasersart University	**Xingguo Liang** Ocean University of China
12:00-13:00	**Lunch**		

May 14th (Wednesday) Morning

Forum V - Safety Control of Aquatic Products

No. 2 Conference Room, Huanghai Hotel **English**

Time	Speeches	Speakers	Chairman
8:30-8:55	Enhanced safety of raw oyster meat by gamma irradiation	**Pattama Ratana-arporn** Kasersart University	**Albert Wingnang Leung** The Chinese University of Hong Kong **Shigeru Sato** Kitasato University
8:55-9:20	A virtual screening method for inhibitory peptides of angiotensin I converting enzyme from *Phascolosoma esculenta*	**Jingli Xie** East China University of Science and Technology	
9:20-9:45	Seasonal changes in thermostability of several muscle proteins and enzymes from silver carp	**Chunhong Yuan** Kagoshima University	
9:45-10:10	Chemical characterization and biological activity of sulfated polysaccharide from Thai agarophyte	**Jantana Praiboon** Kasersart University	
10:10-10:25	**Break**		
10:25-10:50	A novel ELISA system to quantitate paralytic shellfish poisoning toxins	**Shigeru Sato** Kitasato University	**Chyuan-Yuan Shiau** National Taiwan Ocean University **Pattama Ratana-arporn** Kasersart University
10:50-11:15	Development of analytical techniques for characterization of dietary phospholipid sources (krill, egg…)	**Li Zhou** Nanjing Agricultural University	
11:15-11:40	Identification of the IgE binding epitopes of shrimp tropomyosin with immunoinformatics tools	**Zhenxing Li** Ocean University of China	
12:00-13:00	**Lunch**		

20th March, 2014

Dear Dr. Vivi Endar Herawati,

It is our great pleasure to invite you to the 2014 China-Japan-Korea and Southeast Asia Joint Symposium on "ADVANCED PROCESSING TECHNOLOGY and SAFETY CONTROL of AQUATIC PRODUCTS" which is organized by China Society of Fisheries and Ocean University of China. The symposium is scheduled between May 12th and 14th at Qingdao, China.

Four topics of interest include, but are not limited to: "processing and preservation of aquatic products", "high value utilization of aquatic resources", "nutrition and safety of aquatic products" and "utilization of bio-technology in aquatic food". As the chairman of the symposium, I am honored to invite you for your attendance. We are looking forward to your presence in the symposium.

As an invited expert, your registration fee and accommodation expense in Qingdao will be covered by the symposium. Thank you for your consideration of this important conference.

Waiting for you in Qingdao!

Best Regards,

Changhu Xue

Dr. Prof. Changhu Xue
College of Food Sci & Eng., Ocean University of China
Chair, Organizing Committee

Nutrient value content *daphnia magna* mass-cultured for larvae rearing in fish aquaculture

[a.] Herawati.V.E., [a.] Johannes Hutabarat, [a.] Pinandoyo, [b.] YS.Darmanto

[a] *Program of Aquaculture;*

[b] *Processing Technology of Aquatic Products Department of Fisheries, Faculty of Fisheries and Marine Science, Diponegoro University, Jl Prof Soedharto, Semarang 50275 Central Java – Indonesia*

Email : anshinvie@yahoo.com

Abstract: *Daphnia magna* is a highly nutritious natural woof that owes its quality on its culture medium. Fermented farm waste is used to improve the quality of *Daphnia magna* to be given to fish larvae. This research is aimed at improving the quality of *Daphnia magna* using farm waste consisting of chicken dung, copra residue, and bran that is fermented with pro-biotic bacteria in order to find the best culture composition for quality *Daphnia magna* by using proximate, amino acid profile and fatty acid profile analyses. The materials used are *Daphnia magna*, pro-biotic bacteria (*Lactobacillus* and *Sacharomyces caravisae*), chicken dung, copra residue, and bran.

Results show that the highest nutritional contents based on proximate analysis are for treatment B; 72.90% protein content, and treatment A; 7.57% fat content. Results of fatty acid profile for SAFA (saturated fatty acid) for *palmitate* fat is the highest in treatment A, at 3.78%; and for linoleic fat is the highest in treatment A, at 0.20%. Whereas the highest linoleic fat is in treatment B, at 0.20%, the highest oleic fat is in treatment A, at 1.33%, and the lowest is in treatment K, at 0.77%. And EPA and DHA fatty acids in treatment A up to control are in the range of 0.01-0.02%. Results of amino acid profile analyses show that the highest non-essential acid is glutamate in treatment A, at 76,612.69 ppm, and the highest essential acid is lysine in treatment B, at 44,165.25 ppm.

Keywords: nutritional content, fatty acid and amino acid profiles, *Daphnia magna*, mass culture, larvae rearing

NUTRIENT VALUE CONTENT *Daphnia magna* MASS-CULTURED FOR LARVAE REARING IN FISH AQUACULTURE

[a.] Vivi Endar Herawati., [a.] Johannes Hutabarat, [a.] Pinandoyo, [b.] YS.Darmanto

[a.] Program of Aquaculture; [b.] Processing Technology of Aquatic Products
Department of Fisheries, Faculty of Fisheries and Marine Science,
Diponegoro University, Jl Prof Soedharto, Semarang 50275
Central Java – Indonesia
Email : anshinvie@yahoo.com

Abstract

Daphnia magna is a highly nutritious natural woof that owes its quality on its culture medium. Fermented farm waste is used to improve the quality of *Daphnia magna* to be given to fish larvae. This research is aimed at improving the quality of *Daphnia magna* using farm waste consisting of chicken dung, copra residue, and bran that is fermented with pro-biotic bacteria in order to find the best culture composition for quality *Daphnia magna* by using proximate, amino acid profile and fatty acid profile analyses. The materials used are *Daphnia magna*, pro-biotic bacteria ((*Lactobacillus* and *Sacharomyces caravisae*), chicken dung, copra residue, and bran.

Results show that the highest nutritional contents based on proximate analysis are for treatment B; 72.90% protein content, and treatment A; 7.57% fat content. Results of fatty acid profile for SAFA (saturated fatty acid) for *palmitate* fat is the highest in treatment A, at 3.78%; and for linoleic fat is the highest in treatment A, at 0.20%. Whereas the highest linoleic fat is in treatment B, at 0.20%, the highest oleic fat is in treatment A, at 1.33%, and the lowest is in treatment K, at 0.77%. And EPA and DHA fatty acids in treatment A up to control are in the range of 0.01-0.02%. Results of amino acid profile analyses show that the highest non-essential acid is glutamate in treatment A, at 76,612.69 ppm, and the highest essential acid is lysine in treatment B, at 44,165.25 ppm.

Keywords: nutritional content, fatty acid and amino acid profiles, *Daphnia magna*, mass culture, larvae rearing

Introduction

Freshwater fish farming such as for goldfish, *pangasius,* and catfish is the top commodity in the Department of Marine and Fisheries. Demands for these fishes are growing every year. Goldfish produce sets the example by registering 446,199 tons, which increased to 567,078 tons in 2011, and rose again to 695,063 tons in 2012 (Komut KKP, 2013). This ever growing demand also owes to the fact that the fish is delicious, nutritious, and easy to farm. Increased fish production requires a healthy supply of quality larvae. And this very much depends on the quality of woof and water in the culture ponds. Getting adequate quality woof is the main problem faced by hatcheries as woof affects the survival and growth of cultured fish larvae.

Natural woof is the best for larvae as it contains 40-60% amino acid, and no artificial woof can replace this trait (Aksoy *et al.,* 2007 and Herawati *et al.,* 2013). *Daphnia magna* is the best woof as it is nutritious and fits the mouth of larvae (Damle and Chari, 2011). Nutritional quality of *Daphnia magna* depends on its culture medium (Herawati *et al.,* 2012 and Nwachi, 2013). Nutrient in culture medium determines the nutritional quality of *Daphnia magna.* Nitrogen, Phosphate, and Calcium are indispensible for the growth of algae and protozoa upon which daphnia sp feed on (Zahidah, 2012).

The process of *Daphnia magna* culturing relies on the use of chicken dung and KJA cultivation which are fermented with the help of EM4 (Zahidah, 2012), with the single aim of accelerating population growth and increasing nutritional content. Fish, corn, and palm oils are also used to culture *Daphnia magna* in order to increase linoleic acid production that is fundamental in the growth of freshwater fish (Makoginta *et. al.*, 2003).

Pro-biotic bacteria and farm waste are not widely used to culture *Daphnia magna* as yet, despite the fact that pro-biotic bacteria increase biomass production and enrich nutritional contents (proximate, total fatty acid, and essential amino acid). Pro-biotic bacteria are the ones that support the survival of other organism (Balcazar *et al.*, 2006 and Nwachi, 2013). Where as its real function as mentioned in the research conducted by Balca'zar *et al.,* 2006, is as a source of nutrient that contributes to the fish' digestion enzymes, and to facilitate the absorption of organic materials. Nwachi (2013) explains that the function of pro-biotic bacteria is to increase the fish' immunity against pathogens, and contributes to the fish' digestion enzymes. Hence, this research aspires to figure the growth pattern of *Daphnia magna* and its nutritional content and attempts to culture *Daphnia magna* using organic fertilizer with pro-biotic bacteria fermentation to help rear fish larvae, and in turn, improving its quality and production.

As an effort to improve the nutritional quality of *Daphnia magna* in this study doing engineering technology using chicken manure, coconut cake and rice bran are fermented using probiotic bacteria with the aim to find the best composition of the culture medium on the nutritional quality of Daphnia sp. through proximate analysis, fatty acid profile and amino acid profile.

Method and Material

This research is experimental in nature. The materials used are *Daphnia magna,* chicken dung, copra residue, and bran.

Tools preparation and sterilization refers to the research of Hoa *et al.,* (2011), in that tools are sterilized by washing and heating them. And containers are washed and brushed with soap and dried under the sun.

The Method is as follows:

Fermentation Stage

Organic fertilizer (chicken dung, copra residue, and bran) are dried and subsequently weighed to the required dose of 2.4 kg/l (Jusadi et al., 2005). The treatments used based on preliminary experiment prior to experiment (Izza, 2014), are; (A) chicken dung addition (1.2g/l), combined with a mix of (1.2g/l) of bran, and 0g/l of copra residue; (B) chicken dung addition (1.2g/l), combined with a mix of (0g/l) of bran, and (1,2g/l) of copra residue; (C) chicken dung addition (1.2g/l), combined with a mix of (0.9g/l) of bran, and (0.3g/l) of copra residue; (D) chicken dung addition (1.2g/l), combined with a mix of (0.3g/l) of bran, and (0.9g/l) of copra residue; (E) chicken dung addition (1,2g/l), combined with a mix of (0,6g/l) of bran, and (0,6/l) of copra residue; and (F) the addition of a mixture of organic fertilizer with (2.4g/l) of chicken dung without fermentation.

The weighed amount of fertilizers is given pre-activated pro-biotic bacteria (*Lactobacillus casei* and *Sacharomyces cerevisiae*). They are then sealed tight with plastic bags and tied up to keep them air tight, and then they are left for fungus to form and acidic smell to spur. Once they are ready, tiny holes on the plastic bags are made, before they are added to the culture media and aerated for 14 days. Once the media is ready, 100 in/l *Daphnia magna* is the inoculated (Damle & Chari, 2011).

The nutritional content of fertilizers underwent farm waste treatment with the help of pro-biotic bacteria fermentation for *Daphnia sp* mass culture is given in Table 1.

Table 1. Nutritional content of fertilizers underwent farm waste treatment with the help of pro-biotic bacteria fermentation for *Daphnia magna* mass culture.

Parameter	Unit (%)	A	B	C	D	E	K	Test Method
N	%	0,67	0,92	0,73	0,90	0,88	2,31	Kjedahl
P	%	0,20	0,39	0,33	0,55	0,35	1,43	AOAC
K	%	0,43	0,70	0,52	0,64	0,64	5,43	AOAC

The highest nutrient is in treatment K and the lowest is in treatment A. After being cultured for two months, *Daphnia magna* is harvested for its nutritional contents (proximate, fatty acid, amino acid) to be analyzed.

Grazing Rate

The rate of natural woof consumption (grazing rate) according to Herawati, 2013) is:

Grazing rate/7 days = consumed woof/Artemia sp treatment = X cell/Artemia sp/7 days

Grazing rate/day = X cell/treatment day = Y cell/Artemia sp/day

Consumed Daphnia sp algae, consumed woof:

Consumed algae = U cell/ml

Treatment volume: Y cell/Daphnia sp/day = consumed woof (%) U cell/ml

Fatty Acid Profile

The fatty acid profile is revealed from total fatty acid analysis of *Daphnia magna*. The tool used is a gas chromatograph with W Cot fused silica columns and CP-SIL-88 counter. The chromatograph is of 50 m length, 0.22 mm diameter, and 120-200°C temperature. The method used is trans-sterilization (Park and Goins, 1994). 100 µl *Daphnia* sp is homogenized with 4 ml of water. This sample is put into a test tube, then 100 µl methylene chloride and 1 ml of 0.5 N NaOH, and nitrogen are also added. The tube is then heated to a temperature of 90 ° C for 10 minutes. The tube is then cooled down and 1 ml of 14% BF3 is added. Then after another nitrogen addition the tube is further heated for the next 10 minutes. Next, the tube is cooled down to room temperature before 1 ml of pure water and 200-500 µl of hexane are added.

Finally fatty acid methyl esters are collected and after centrifugation, its top layer is ready for GC analysis.

Essential Amino Acid Profile

The essential amino profile is figured out by the analysis of essential amino acid in *Daphnia magna*. The analysis is performed using HPLC. The HPLC has a C18 column Eurospher 100-5, 250x4, 6mm with pre-column P / N: 1115Y535. The effluent is in a form of Acetate Buffer pH 5.9 0:01 M then B = (MeOH: 00:01 Acetate Buffer pH 5.9 M: THF> 80:15:5 Λ Fluorescence: Ext: 340 mm Em: 450 nm. The sample is weighed to ± 2.5 grams and then put into the sealed glass test tube and 15 ml of 6N HCl is added. The tube is then vortexed to make the mixture homogenous, before it is then dialyzed using an autoclave at 110 ° C for 12 hours and then cooled down to room temperature. Once it is done, the sample is then neutralized with 6N NaOH, 2.5 ml of 40% Pb acetate is then added and 1 ml of 15% oxalic acid. The next step is to take ± 3 ml of sample to be filtered with millex 0.45. For the solvent of 25 ml + millex 475µl. OPAA is then injected into the HPLC, leave it react for 3 minutes, before another 30 ml is injected into the HPLC.

Data Analysis

This research is experimental in nature and the data collected are quantitative data of water quality, grazing rate, proximate test result, amino acid profile, and total fatty acid profile.

Result and Discussion

Grazing rate is the rate of daily woof consumption (Widiastuti *et al.,* 2012). The woof for *Daphnia magna* is algae and protozoa (Damle & Chari, 2011). This research revealed that the green algae *Chlorella vulgaris* dominates and is the main intake for *Daphnia magna*. The highest grazing rate for *Daphnia magna* is in treatment B, at 374.33 cell/ *Daphnia magna* /day. The second highest is treatment E, at 353.11 cell/ *Daphnia magna*/day. Followed by treatment D, at 327.17 cell/ *Daphnia magna*/day; treatment A, at 326.14 cell/ *Daphnia magna*/day; treatment C, at 316.91 cell/ *Daphnia magna* /day; and the last is treatment F, at 250.83 cell/ *Daphnia magna* /day. *Daphnia magna* in the mass culture medium of 1.2g/l of chicken dung, mixed with 0.6g/l of bran, and 0.6g/l of copra residue gives the best grazing rate. This medium allows the growth of more phytoplankton that *Daphnia magna* feed on; hence it prefers *Chlorella vulgaris* better. This result is confirmed by the research of Harrison *et al.*, (2008) which mentions that higher preference leads to better grazing rate.

Proximate Analysis

The nutritional quality of Daphnia sp can be figured out using proximate analysis, and fatty acid and amino acid profiles. Table 2 shows the result of proximate analysis for *Daphnia magna* which is mass-cultured using farm waste medium that is fermented by pro-biotic bacteria.

Table 2. Results of proximate analysis for *Daphnia magna* which is mass-cultured in fermented farm waste medium

Treatment	100% Dry Matter Content Ratio			
	Protein (%)	Carbohydrate (%)	Lmk ksr(%)	Dust (%)
A	67.45±0,02	15.07±0,05	7.57±0,02	9.90±0,03
B	72.90±0,04	14.22±0,03	4.24±0,03	8.64±0,03
C	68.45±0,06	14.87±0,05	7.89±0,02	8.79±0,02
D	72.07±0,02	12.25±0,02	6.40±0,02	9.27±0,06
E	72.26±0,06	12.40±0,02	6.04±0,04	9.29±0,07

Izza , Herawati, Suminto (2014)

Proximate analysis reveals that the highest protein content is in treatment B, at 72.90% and the lowest is at treatment A, at 67.45%. Hence the difference is 5.45%. For fat, the highest is in treatment A, at 7.56%, and the lowest is in treatment B, at 4.24%. Hence, the difference is 3.32%.

The protein content in this research is 72.90%, higher than that reported by Mokoginta et al., (2003), at 68.12%, and that of Naila et al., (2009), at 4% gross weight. Whereas the fat content in this research is 7.56%, lower than that of Mokoginta *et a*l., (2003), at 23.52%, and that of Nina *et al*., (2009), at 0.54% gross weight.

This significantly higher protein content and lower fat content is due to the higher levels of nitrate and phosphate that cause higher protein and lower lipid concentrations. This is confirmed by the statement of Hu and Gao (2006) and Widianingsih *et al*., (2011) who stress that higher nitrate and higher protein statement.

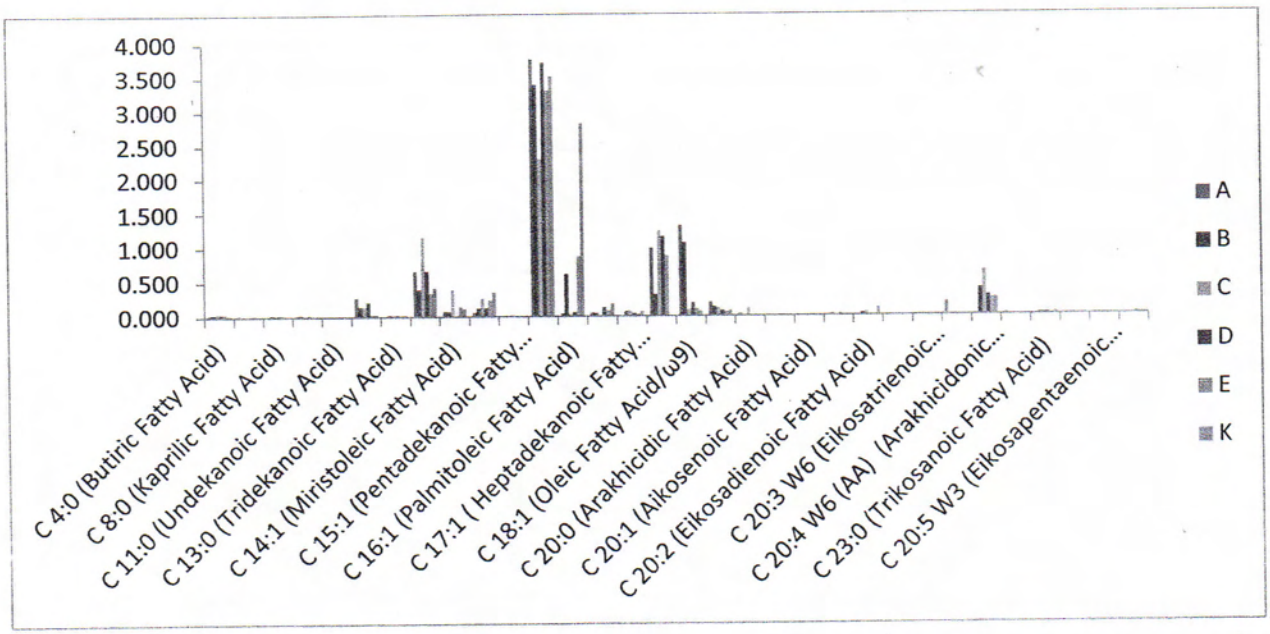
Protein requirement for fish larvae is around 40-60%, while the need for protein is around 3-10% (Mokoginta *et. al.,* 2003, Jusadi *et.al.*, 2004, and Nina *et. al.,* 2012). Therefore, results of proximate analysis shows that the nutritional content of *Daphnia magna* meets the nutritional requirements of cultured fish larvae.

Water Quality

The water quality during the research is maintained at 28-29^{0}C temperature, 0.3 ppm DO and 7-8 pH, which is ideal. This is in line with the statement of Mokoginta *et al*., (2003) and Nina *et al*., (2012) that the proper temperature for Daphnia sp culture is 25-30°C, DO at 0.3-0.6 ppm, and pH at 6.5-9. Excellent water quality helps grow phytoplankton and algae for *Daphnia magna* to propel its growth.

Fatty Acid Profile

Results of fatty acid analysis for *Daphnia magna* which is cultured in fermented farm waste medium is given in Graph 1.



Graph 1. Fatty acid profile of *Daphnia magna* that is cultured in fermented farm waste medium

Results of fatty acid profile analysis for saturated fat (SAFA) show that the highest for palmitate fat in treatment A, at 3.78%, and the lowest is at treatment C, at 2.31%. Hence, the difference is 1.47%. For linoleum fat, the highest is in treatment A, at 0.20%, and the lowest is in treatment E, at 0.06%. For linolenat fat, the highest is in treatment B, at 0.20%, and in treatment A and E, the values are not identified as they are too little. For oleic fat, the highest is in treatment A, at 1.33%, and the lowest is in treatment K, at 0.77%. While for EPA and DHA acid fats underwent A to Control treatment yield 0.01-0.02% concentration.

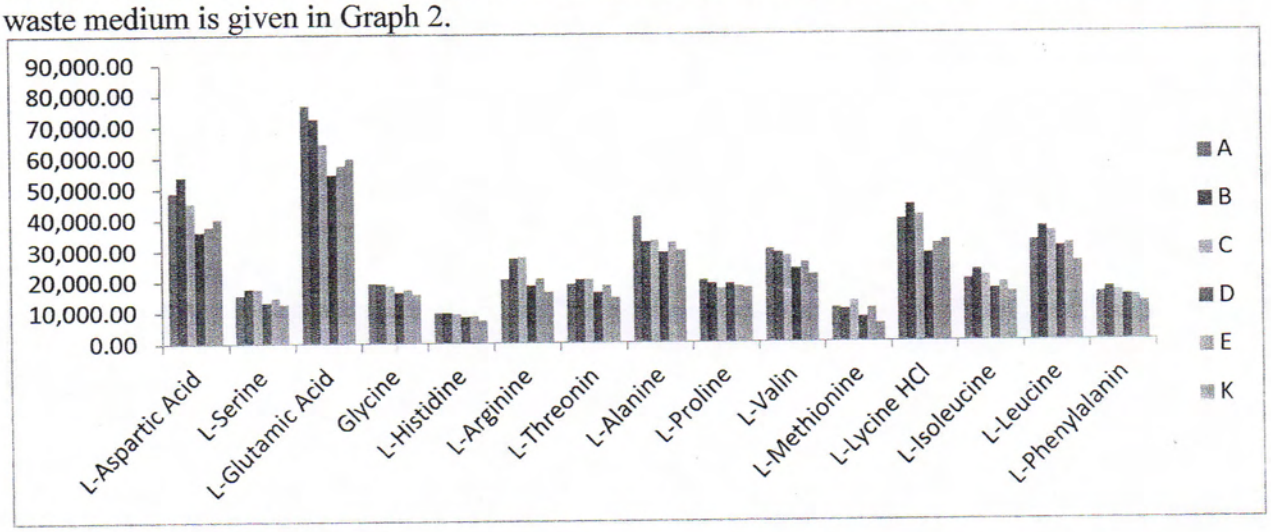
Palmitate saturated fat is detected in this research as it serves as energy storage for both phytoplankton and zooplankton. This statement is emphasized by Brown (2002), who mentions that palmitate saturated fat stores that will then be used for biosynthesis of saturated fat. Meyer (2004) and Benjamin & Olivia (2007) also state that palmitiate acid is the substrate of SAFA fatty acid biosynthesis process.

For unsaturated fat, the highest content for oleic acid is in treatment A, at 3.78%. Oleic fatty acid is the substrate that forms the long chain of PUFA. This statement is supported by Pratiwi *et al.,* (2009) who says that oleic fatty acid is the substrate in the process of de-naturation and is the catalyst for PUFA biosynthesis that starts from oleat fatty acid and into linoleat as the basic substrate that forms the long chain of omega 6 and into linolenic as the basic substrate that forms the long chain of omega 3.

Fish larvae need a lot of n6 and n3 fatty acid as the essential fatty acid for higher level of survival and growth. And this need varies among species. Results of this research indicate the range for linoleat and linolenic acids at 0.06- 0.20%, which is lower compared to the result of Mokoginta *et al.*, (2003), at 0.97-3.74%. While the requirement for fatty acid according to the research by Mokoginta *et al.*, (2003), Jusadi *et al.*, (2004) is at 0.5%, and according to Lim *et al.*, (2011) and Nina *et al.*, (2012) is at 0.2-1%. Therefore, the level of linoleum and linolenat fatty acid in this research still meets the need of the fish larvae.

Amino Acid Profile

Results of amino acid profile analysis for Daphnia sp that is mass-cultured in fermented farm waste medium is given in Graph 2.



Graph 2. Amino acid profile of D*aphnia magna* that is mass-cultured in fermented farm waste Medium

Results of non-essential amino acid profile analysis show that glutamate is the highest in treatment A, at 76.612.69 ppm and the lowest is in treatment D, at 54.396.69 ppm. Whereas for essential amino acid profile, reveals that lysine is the highest in treatment B, at 44.165.25 ppm, and the lowest is in treatment D, at 28.562.46 ppm.

Fish larvae need essential amino acid as it supports their growth and replaces their broken cells (Brown, 2002 and Herawati *et al.*, 2013). Glutamate amino acid is a natural component that combines substances in metabolism and is an element that builds protein. This statement is supported by that of Brown (2002), who mentions that glutamate amino acid is a natural component in living organisms to help them metabolize. Whereas according to Herawati *et al.*, (2013) and Ovie&Ramasamy (2013), lycine amino acid forms vitamin B1, is an anti-virus agent, helps with calcium absorption, stimulates appetite, and help producing carritin to change fat into energy. The essential amino acids for fish and shrimp larvae according to Brown (2002), Herawati et al., (2013), and Ovie&Ramasamy (2013) are leucina, isoleucina, valina, and lycine.

Conclusion

It can be inferred from this research that the addition of 1.2g/l chicken dung mixed with 0.6g/l bran and 0.6g/l copra residue gives the best protein at 72.90%, according to proximate analysis. While the highest content of fat is attainable with the addition of 1.2g/l chicken dung mixed with 1.2g/l bran and 0g/l copra residue, which gives 7.56% fat. Results of saturated fatty acid profile analysis reveal the best medium made of 1.2g/l chicken dung mixed with 1.2g/l bran and 0g/l copra residue, which yields 3.78%. But for unsaturated fatty acid, the best medium is that of 1.2g/l chicken dung mixed with 0.6g/l bran and 0.6g/l copra residue, which provides 0.20%. Results of essential amino acid profile analysis show the best medium made of 1.2g/l chicken dung mixed with 0.6g/l bran and 0.6g/l copra residue, which results in 44,165.25 ppm of lycine.

Acknowledgments

Author acknowledgments to Mr. Edi Secretary APPIHIS Semarang, Nana, Fritta and Hindra for the assistance given during the study. Thanks also presented at the Ministry of Education and Culture, tax state revenue (non-tax revenues) for Fiscal Year 2014, Diponegoro University, through the Budget Implementation List (DIPA) Number DIPA Diponegoro University - 023.04.02.189185/2014 dated December 5, 2013 the funds provided for implementation fundamental research.

BIBLIOGRAFI

Aksoy., M. C. Lim., D.A. Darvis., R. Shelby and P.H. Klesius. 2007. Influence of Dietary Lipid Sources on The Growth Performance, Imune Respos and Resistance of Tilapia (*Orechromis niloticus*) to *Stretococus iniae* challenge. *J. Applied. Aquat. 19:29-47.*

Benjamin. A. Olivia A. 2007. Lipid Classes and During Emberyogenesis Fatty Acids of Captiveand Wild Silverside.. *Word Aquat.. Scienc 37(5): 115-123*

Brown. M. 2002. Preparation and Assessment of Microalgae Concentrates as Feed for Larva and Juvenile Pacific Oyster. *J. Word Aquat.. Scienc 23(6): 305-312*

Damle and M. S. Chari., 2011. Performance Evaluation of Different Animal Waste on Culture of *Daphnia* sp. *Journal of Fisheries and Aquatic Sciences* 6(1):57-61. DOI: 10.3923/jfas.2011.57.61.

Herawati. V. E., Johannes Hutabarat., Budi Prayitno. 2012. Effect of Using Guillard and WAalne Technical Culture Media on Growth and Fatty Acid Profiles of Microalgae *Skeletonema* sp. In Mass Culture. *J. Coast. Dev. 16:(1).48-54.*

Herawati. V. E., Johannes Hutabarat., Budi Prayitno. 2013. Analysis Different Culture Media Technical For *Chaetoceros calcitrans.* and *Skeletonema costatum.* Improving the Nutritional Quality of *Artemia salina* Local products as shrimp larvae feed vanname (*Litopennaeus vannamei*) Stadia PL1-PL10. [Disertasi]. Universitas Diponegoro.

Herawati. V. E., Johannes Hutabarat., Budi Prayitno., Ocky Karna Radjasa.. Darmanto., 2013. Profile of Essential Amino Acid, Fatty Acid and Growth of *Chaetoceros gracilis* Using Technical Culture Media Guillard and Double Walne. *Prosiding.* FFTC-NTOU Joint International Seminar on Integrating of Promissing Technologyfor Aquaculture and Fisheries., Taiwan. 50-56pp.

Hoa. V.N.H., Thi N.A., Tnanh. 2011. Artemia franciscana Kellog, Production in Earthen Pond: Improved Culture Techniques. *J. Aquat Liv. Resc. 21:13-2.*

Izza. 2014. Patterns of Growth and Biomass Production of Daphnia sp. Using cultured Fermented Organic Fertilizer Using EM4. (Skipsi). Fisheries and Marine Sciences Faculty. Diponegoro University. 65pp

Jusadi., D. Sulasingkin., I. Mokoginta. 2005. Effect of Different Concentrations Against Yeast Growth and Population Daphnia sp. *Journal of Aquatic Sciences* 12(1): 17-21.

Jusadi., Hasyim., Mokoginta. 2004. Effect of Artemia enriched with Fish Oil, Corn Oil and Coconut Oil Against Brain Volume Growth and Tilapia larvae. *Indonesian Journal of Aquaculture* 3(1): 5-8

Lim C., M. Yildim-Aksoy., P. Klesius. 2011. Lipid and Fatty Acid Requirements of Tilapia, North Amerika. 2011. *Journal of Aquaculture 73:188-193.*

Lim C. and C. D. Webster. 2006. Tilapia: Biologi Culture and Nutrition. The Haworth Press, Inc., Binghamton., New York., USA.

Meyer. A., 2004. Novel Fatty Acid Elongase and Their Use For The Lipid Reconstruction of Docohexanoic Byosyntesis. *Journal of Lipid Research 5: 189-199.*

Mokoginta., D. Jusadi., T.L. Pelawi. 2003. Effect of administration of Daphnia sp. enriched with different fat sources on the survival and growth of tilapia larvae (Oreochromis niloticus). *Indonesian Journal of Aquaculture 2(1):7-11.*

Nina Scholotz,. Jesper Givskov., Dominik Martin. 2012. The Potential og Dietary Polyunsaturated Fatty Acid To Modulate Ercosanoid Syntetis and Reproduction in *Daphnia* sp. Magna. *Journal of Phsiology 162(4): 449-454.*

Nwachi., 2013. An Overview of The Importance of Probiotics in Aquaculture. *J. Fish. Aqut. Scie. 8(1):30-32.* DOI: 10.3923/jfas.2013.30.32.

New., M. 1987. Feed and Feeding of Fish and Shrimp. United Nations Development Progamme Food and Agriculture Organization of United Nations. Rome.275 pp.

Ouli. 2012. An Overview of The use of Fatty acids Fish Farming Research During The Last Decade With Particular Emphasis on Fish Quality. *J. World. Aquat..Scie. 43(3): 291-320.* DOI: 10.1111/j.1749-7345.2012.00565x.

Ovie and P. Ramasamy. 2013. Lycine Requirement and its Effect on Body Composition of *Oreochromis niloticus* fingerlings. *J. of Fish. and Aquat. Scie.* 8(1): 94-100. DOI: 10.3923/jfas.2013.94.100 Rakhman., H. Hamdani., G. Setiadarma. 2013. Pengaruh Urine Kelinci Hamil Dalam Media Kultur Terhadap Kontribusi Anak Setiap Kelompok Umur *Daphnia* spp. *Jurnal Perikanan dan Kelautan 3(3): 33-40.*

Pratiwi. A. D. Syah., Hardjito., L. Goreti. 2009. Fatty Acid Syntetys by Indonesian Marine Diatom. *Hayati Journal of Biosciences 16(4): 151-156*

Rakhman., H. Hamdani., G. Setiadarma. 2013. Pengaruh Urine Kelinci Hamil Dalam Media Kultur Terhadap Kontribusi Anak Setiap Kelompok Umur *Daphnia* spp. *Jurnal Perikanan dan Kelautan 3(3): 33-40.*

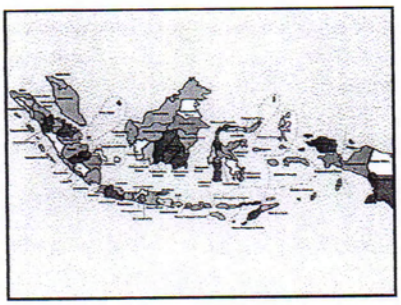
Valverde., S. Martinez-Liorens., A. T. Vidal., C. Rodriguez., J. Estevanel., J. I. Gairin., P. M. Domingues., C. J. Rodrigues., B. Garcia. 2013. Amino acids composition and protein quality evaluation of microalgae and meals for feed formulations in *Cephalopods. J.Aquat.Int.21 (2): 413-433.*

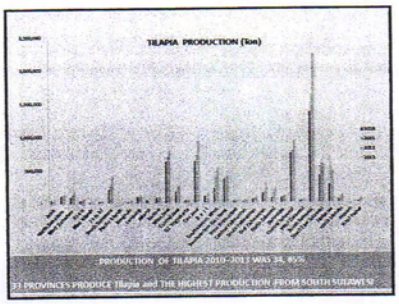
Widianingsih. Retno Hartati.Endrawati. Ervia Yudiati. Valentina. 2011. Nutrient Reduction Effect of Phosphate and Nitrate Concentrations Against Total Lipid Content Nannocloropsis oculata. *Journal of Marine Science* 16(1): 24-29

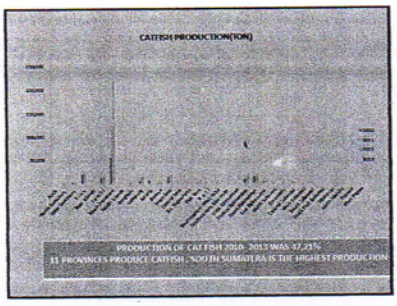
Zahidah., W. Gunawan., V. Subhan. 2012. Population growth of Daphnia sp. Fertilizer Waste fed cultivation in the reservoir Cirata KJA fermented EM4. , 2012. *Journals Aquatics 3(1): 84-94.*

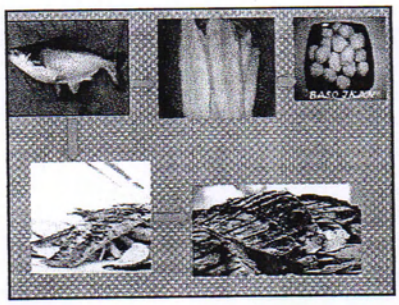
Nutrient Value Content *Daphnia magna* Mass-Cultured for Larvae Rearing in Fish Aquaculture

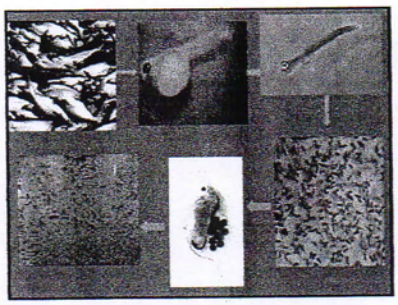
Dr. VIVI ENDAR HERAWATI
AQUACULTURE DIVISION
FACULTY OF FISHERIES AND MARINE SCIENCE
DIPONEGORO UNIVERSITY

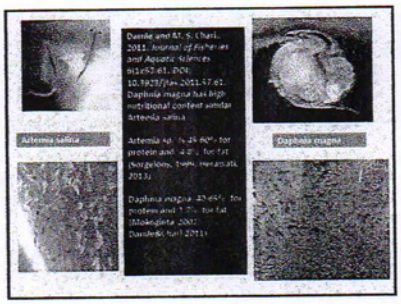


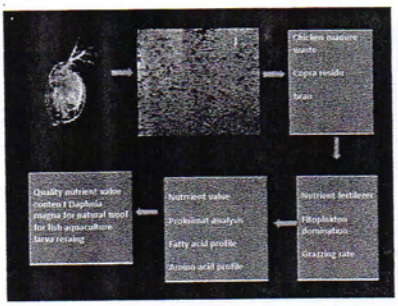












- The purpose of this research is using engineering technology livestock using chicken manure, copra residu and bran are fermented using probiotic bacteria to find the best composition of the culture media on the nutritional quality of *Daphnia magna* by proximate analysis, fatty acid profile and amino acid profile for fish larva rearing.

1. The benefit of the research is to find of the best nutrient in mass culture for *Daphnia magna*
2. Find of the best nutrient value content (proksimat, fatty acid profile and amino acid profile) in mass culture for *Daphnia magna*

MATERIAL AND METHOD

The materials utilized in this research were the seeds of *Daphnia magna*, chicken manure waste, bran and copra residu

Once the media is ready, 100 in/l Daphnia sp is the inoculated (Isnaini & Chani, 2011).

- The treatments used based on preliminary experiment to (Resawati and Johannes Hutabarat, 2014), are:

(A) chicken manure waste addition (1.2g/l), 1.2g/l of bran, and 0g/l of copra residue;
(B) chicken manure waste addition (1.2g/l), (0g/l) of bran, and 0.6g/l of copra residue;
(C) chicken manure waste addition (1.4g/l), 0.9g/l of bran, and 0.3g/l of copra residue;
(D) chicken manure waste (1.2g/l), 0.3g/l of bran, and 0.9g/l of copra residue;
(E) chicken manure waste (1.2g/l), (0.6g/l) of bran, and (0.6g/l) of copra residue; and
(F) the addition of a mixture of organic fertilizer with 2.4g/l of chicken dung without fermentation

- Water Quality for The Culture

Parameter	Research	Manual
pH	8,1-8,3	6,5-9*
DO	0,3	0,3-0,6**
Temperature	28-29^{0}C	25-30**

** Nitta, (2012); Daniel&Chani, (2011)
* Mokoginta, (2003)

- **Fatty Acid Analysis**

The fatty was analyzed using Chromatography Gas of Park and Goins (1994).

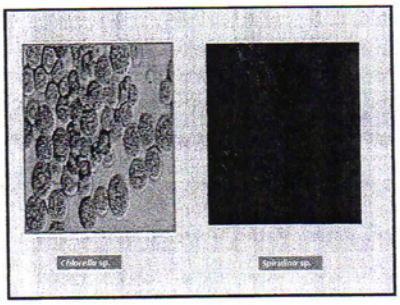
- **Essential Amino Acid Analysis**

The essential amino acid was analyzed using HPLC

RESULT

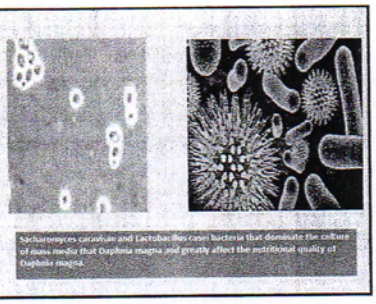
The Analysis Fertilizer Nutrient

Parameter	(%)	A	B	C	D	E	K	Test Method
Nitrogen	%	0,67	0,92	0,73	0,98	0,83	2,31	Kjeldahl
Phosphat	%	0,28	0,38	0,33	0,55	0,35	1,45	AOAC
Kalium	%	0,43	0,70	0,52	0,64	0,44	3,45	AOAC



GRAZING RATE

- The highest grazing rate for *Daphnia magna* is in treatment B, at 374.33 cell/ *Daphnia magna* /day.
- The second highest is treatment E, at 353.11 cell/ *Daphnia magna*/day. Followed by treatment D, at 327.17 cell/ *Daphnia magna*/day; treatment A, at 326.14 cell/ *Daphnia magna*/day; treatment C, at 316.91 cell/ *Daphnia magna* /day; and the last is treatment F, at 250.83 cell/ *Daphnia magna* /day.

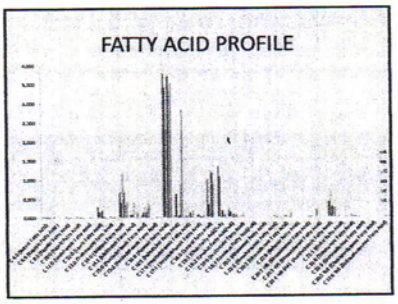


ANALYSYS PROXIMATE

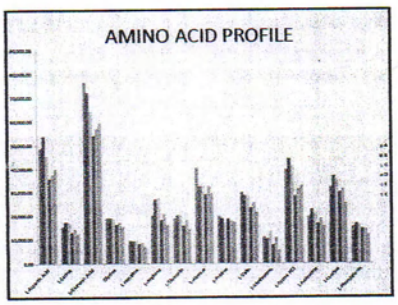
Treatment	Protein (%)	Carbohydrate (%)	Lemak kasar(%)	Debu (%)
A	47.4558,83	15.8710,05	7.5720,83	9.9958,83
B	71.0910,04	14.3210,83	4.3410,83	8.6410,83
C	48.4558,84	14.8710,85	7.5910,85	8.7858,82
D	72.8710,82	11.2510,82	6.4458,83	9.2710,86
E	73.2458,84	11.4458,82	6.6458,84	8.2858,87

The best protein in B and the best for fat in C

FATTY ACID PROFILE



AMINO ACID PROFILE



CONCLUSION

(1.2g/l) chicken manure waste (0g/l) of bran and (0.6g/l) of copra residue gives the best protein at 72.90%

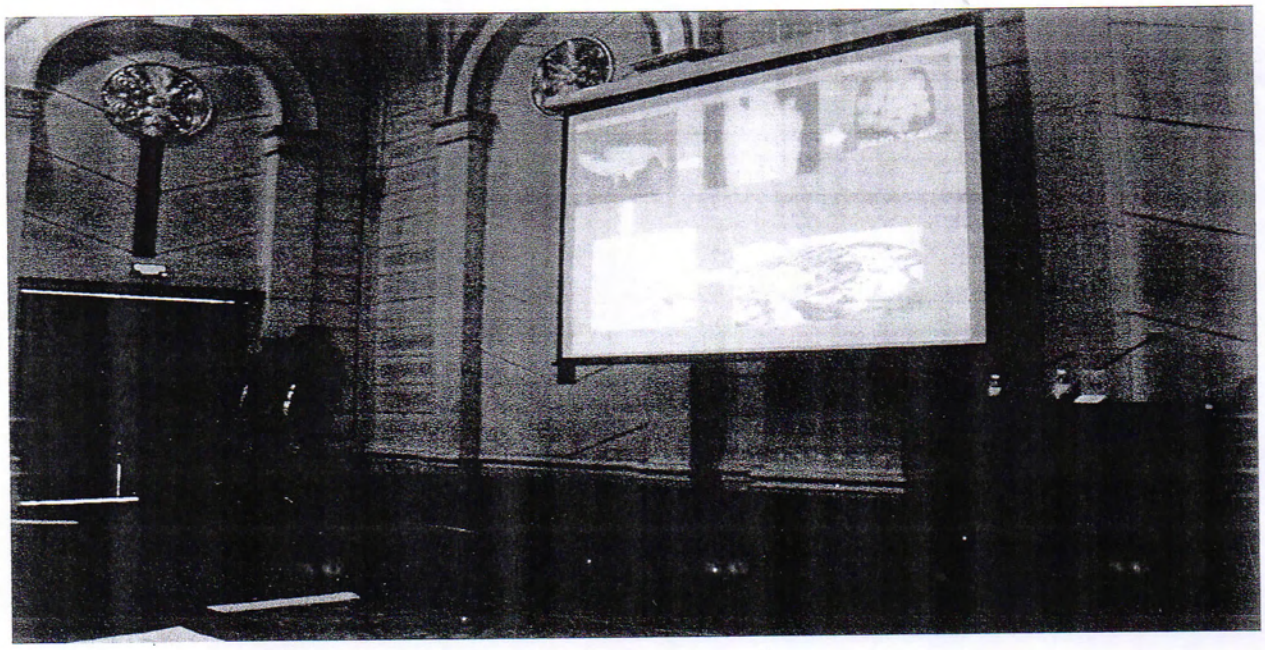
proximate analysis the highest content of fat is attainable with the (1.2g/l) chicken manure waste (0.9g/l) of bran and (0.3g/l) of copra residue, which gives 7.56% fat.

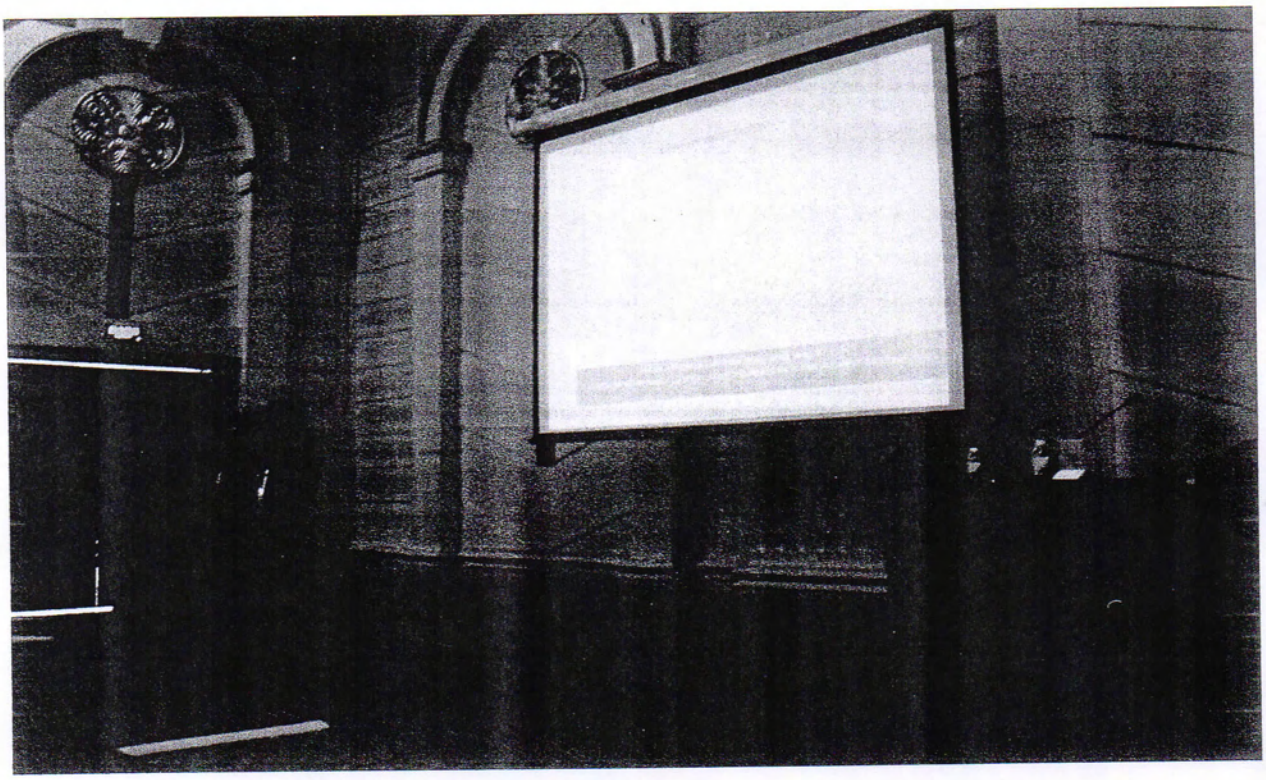
fatty acid profile with saturated fatty acid the best medium made of (1.2g/l) chicken manure waste mixed with (1.2g/l) bran and (0g/l) copra residue, gives 3.78%.

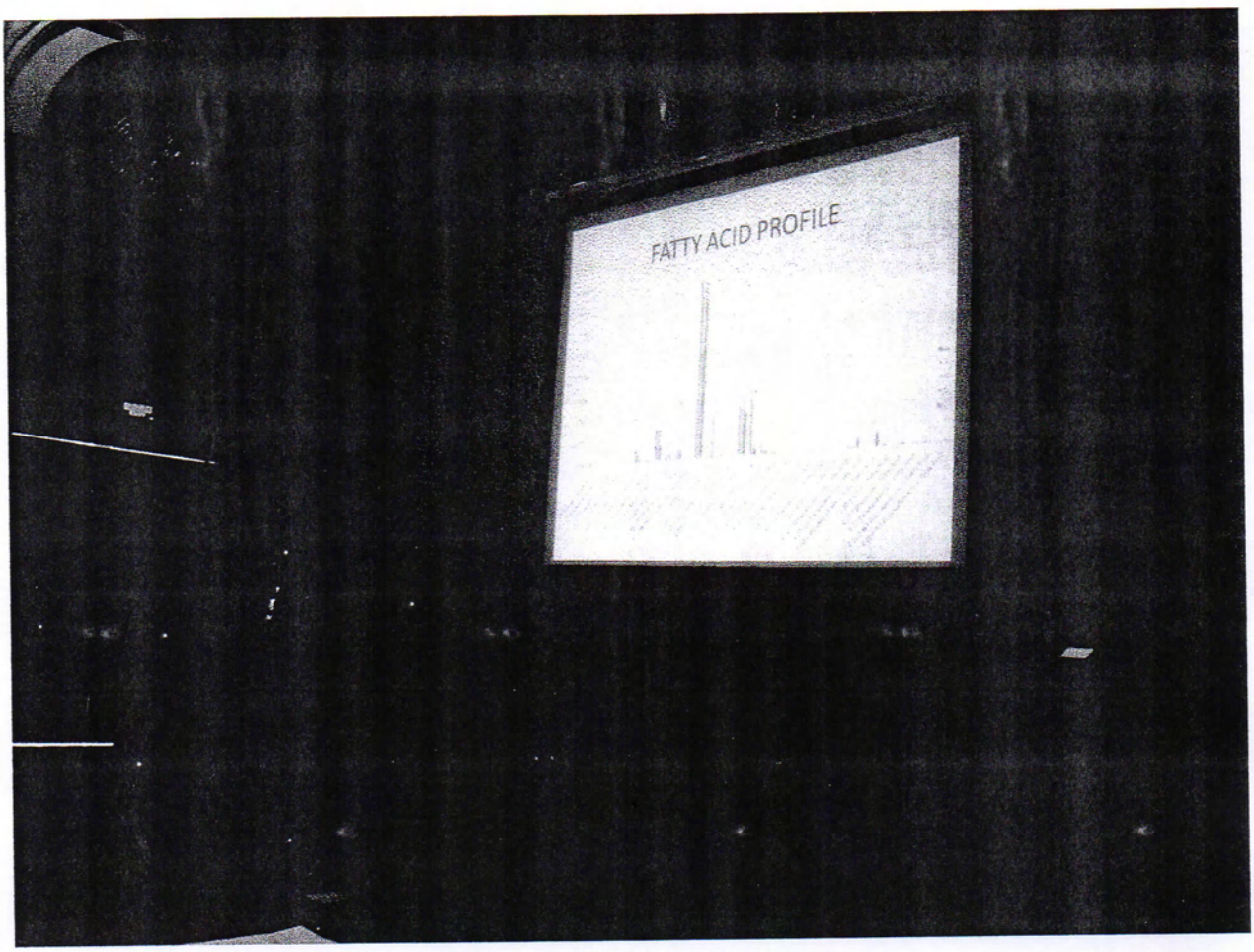
(1.2g/l) chicken manure waste with (0g/l) of bran, and 0.6g/l of copra residu, Gives the best unsaturated fatty acid 0.20%.

Amino acid profile analysis show the best medium made of (1.2g/l) chicken manure waste (0g/l) of bran, and 0.6g/l copra residu gives the best lysine was 44.565.25ppm

DOKUMENTASI SEMINAR INTERNASIONAL CHINA 2014






FATTY ACID PROFILE

Certificate of Participation

This is to certify that

Vivi Endar Herawati

has participated in

2014 China-Japan-Korea and Southeast Asia Joint Symposium on
ADVANCED PROCESSING TECHNOLOGY and SAFETY CONTROL of AQUATIC PRODUCTS

at Huanghai Hotel, Qingdao, China

between 12-14 May 2014

Signed by _____

Date May 14, 2014

Dr. Prof. Changhu Xue

College of Food Sci & Eng., Ocean University of China
Chair, Organizing Committee