

ISSN: 2442-2304

Proceeding

International Congress
"Challenges of Biotechnological Research
in Food & Health"

Saturday, November 15th, 2014

Organized by

Faculty of Technology and Food Industry

Jl. Sumpah Pemuda No. 18 Joglo Kadipiro Telp./Fax +62271-851204

Slamet Riyadi University Surakarta, Indonesia

E-mail : seminar.fatipa@gmail.com / panganunisri@gmail.com

EDITORIAL TEAM

Agung Setya Wardana
Akhmad Mustofa
Kapti Rahayu Kuswanto
Linda Kurniawati
Merkuria Karyantina
Nanik Suhartatik
Yannie Asrie Wulandari
Yustina Wuri Wulandari

PREFACE

First of all, I would like to extend our warmest welcome, and indeed it is a great pleasure to see you all in International congress "**Challenges of Biotechnological Research in Food and Health**", which held in Third Floor of General Meeting Room Slamet Riyadi University Surakarta, Indonesia, November 15th 2014.

Although the awareness of the role of microbes and microbial biotechnology in improving the quality of life has been recognized worldwide, there is an urgent needed to explore avenues in microbial research and the ultimate purpose of solving some major research challenges in biotechnology.

Current advances and trends in microbial research in areas such as food, medicinal, industry, and food processing will be addressed in a regional and international meeting perspective. This proceeding including applied research such as the exploration of technology to decrease mycotoxin in food product.

It is expected that this proceeding will serve as an invaluable platform of recent advances in the field of biotechnological research with academics and researcher from the various aspect of microbiological research. We look forward to a stimulating on current trends and advances in microbiology.

Official Team

Dr. Nanik Suhartatik

LIST OF ARTICLE

- | | | |
|----|---|-------|
| 1 | Antibacterial Assessment of Aloe Vera (<i>Aloe vera chinensis</i> Linn) Cortex Extract and Its Application As Inhibitor for King Prawns (<i>Macrobrachium rosenbergii</i> Linn) Spoilage during Storage at 5°C
Sutardi, Andri Nofreeana, Muhammad Nur Cahyanto | 1-6 |
| 2 | Fermentation in Salt Solution to Produce Jack Beans (<i>Canavalia ensiformis</i> L.) Sauce
Yudi Garnida; Yusman Taufik | 7-13 |
| 3 | Monitoring of <i>E. coli</i> O157 from Raw Cow's Milk in the Storage Tank in Sleman District, Yogyakarta
Marcella indah kristanti, tri yahya budiarso | 14-17 |
| 4 | The Effect of Red Sweet Potato (<i>Ipomoea batatas</i> L.) Substitution on Skim Milk as Prebiotic on Synbiotic Drink Powder Characteristic
Ratih Nawangwulan, Rohula Utami, Edhi Nurhartadi | 18-29 |
| 5 | Screening of Soybean Germplasm Collection Resistance to Rust Disease (<i>Phakopsora pachyrhizi</i>)
Sumartini | 30-31 |
| 6 | Total Phenolic Contents and Antioxidant Activities of Ten Soybean Promising Lines Tolerant to Acid Soil
Eriyanto Yusnawan, Alfi Inayati' And Heru Kuswanto | 32-36 |
| 7 | Chemical and Free Fatty Acid Composition of Goat Milk Cheese Ripened with <i>Lactobacillus acidophilus</i> and Extract Rabbit Stomach as Coagulant
Nurliyani, Sulvia Dwi Astuti, Indratiningsih | 37-40 |
| 8 | Characteristics of Kwetiau Material of Formulation Rice Flour and Uwi Flour, Taro Flour and Kimpul Flour Modified by Heat Moisture Treatment (HMT)
Erning Indrastuti, Muflihah Ramadhia, Ledy Purwandani | 41-47 |
| 9 | Application of Biotechnology Agricultural by Manure, Effort of Sesame Production in Coastal Sandy Land
Dewi Ratna Nurhayati, Prapto Yudhono, Taryono, Eko Hannudin, | 48-55 |
| 10 | Ecological Analysis of Understory Vegetation around Endangered Orchid Pencil (<i>Vanda hookeriana</i> rchb.) from Lake Dusun Besar Nature Reserve Bengkulu
Efri Roziaty | 56-61 |
| 11 | Study of Food Safety on Dark Chocolate Enriched with Cinnamon (<i>Cinnamomum burmannii</i>) during Storage
Dimas Rahadian Aji Muhammad, Intan Nisa Rusulantari, Anasta Ilimi, Yasmin Nabila, Muhammad Isa Dwijatmoko, Dinar Praseptiangga | 62-65 |
| 12 | Varieties of Tomato (<i>Lycopersicum esculentum</i>) by Using Lower Trunk Innovation
Pramono Hadi; Tri Rahayu; Brianata Rosadhi | 66-68 |

13	Chemical and Physical Properties of Sepang (<i>Caesalpinia sappan</i> L.) Instant Drink: Review of Proportion of White Eggs, Maltodextrin, Feasibility of Their Business	69-76
	Nugraheni Retnaningsih, Agustina Intan Niken Tari	
14	Anti-Diabetic Activity of Sambiloto Extract (<i>Andrographis paniculata</i> Ness) to Decrease Blood Glucose Level of Aloxa-Induced Diabetic Rat	77-80
	Sudarmi, Agustina Intan Niken Tari, Wartini	
15	Potency of Beluntas (<i>Pluchea indica</i> Less) Leaves Extract as Antioxidant and Anti Warmed Over Flavor (WOF) Of Duck Meat	81-89
	Paini Sri Widyawati, Tarsisius Dwi Budianta, Fenny Anggraeni Kusuma, Evelyn Livia Wijaya, Dian Ivana Yaunatan, Ribka Stefanie Wongso	
16	Characteristics of Purse-Cowpea Composite Flour Biscuits on Different Types of Packaging During Storage	90-93
	Endang Retno Wedowati, Diana Puspitasari, Fungki Sri Rejeki, Tri Rahayuningsih	
17	Antimicrobial Test of "TUTUP" Flowers (<i>Macaranga tanarius</i> (L.) Mull.Arg.)	94-98
	Fungki Sri Rejeki, Endang Retno Wedowati, Diana Puspitasari	
18	Analysis of Customer Preference on the Cowpea Tempe	99-102
	Agung Setyarini, Catur Rini Sulistyanyingsih	
19	The Effect of Acetic Acid on Characteristics of Tuna Fish Skin Gelatin	103-104
	A.T. Agustin, Meity Sompie	
20	Avoid Contamination in Soybean (<i>Glycine max</i>, L. [Merrill]) Microspores Culture	105-108
	Sumarmi	
21	Salted Egg Interior Quality with Starfruit Extract	109-112
	Sri Sukaryani, Ahimsa KandiSariri, EngkusAinul Yakini	
22	Level of Trader's Knowledge with Rhodamin B Contamination of Shrimp Paste in the Gedong Kuning Market Yogyakarta	113-116
	Agni Yuwanna Bhakti, Sunarti	
23	Evaluation of Peanut Genotypes Resistance to Leaf Spot (<i>Cercospora personatum</i>) and Rust Disease (<i>Puccinia arachidis</i>)	117-121
	Sumartini	
24	Potential of Indigenous Probiotic <i>Lactobacillus plantarum</i> Dad 13 as Anti-Diarrhea and Immuno-Modulator	122-127
	Agustina Intan Niken Tari, Catur Budi Handayani, Sudarmi	
25	Microbial Conversion of Cassava Stem (<i>Mannihot Esculenta</i>) Cellulose into Reducing Sugar by <i>Trichoderma reesei</i> PKJ₂	128-132
	Afriyanti, Sardjono, Sigit Setyabudi	
26	Effect of Protected Indian Sardine (<i>Sardinella Longiceps</i>) Oil, Palm Oil, and Palm Kernel Cake Intake on Digestibility of Dry Matter, Organic Matter, and Crude Protein by Rumen Fluid of Fistulae Ongole Breed Cattle	133-136

Catur Suci Purwati, Wara Pratitis S.S, Susi Dwi Widyawati

- 27 Effectiveness of *Lactobacillus plantarum* Mut 7 Agents Fermentation to Reduce Trembesi (*Albizia saman*) Saponins Content** 137-140
Ahimsa Kandi Sariri
- 28 Lignin Content in Fermentation of Cocoa Pod Husk (*Theobroma cocoa*) Used *Phanerochaete chrysosporium*** 141-143
Engkus Ainul Yakin, Ali Mursyid Wahyu Mulyono
- 29 The Content of Lipids in Intramuscular Adipose as A Quality Determinant of Cattle Meat Product** 144-146
Laurentius J.M. Rumokoy, Wisje L. Toar

THE CONTENT OF LIPIDS IN INTRAMUSCULAR ADIPOSE AS A QUALITY DETERMINANT OF CATTLE MEAT PRODUCT

Laurentius J.M. Rumokoy and Wisje L. Toar

Study Program of Animal Sciences, Faculty of Animal Sciences, Sam Ratulangi University
email: rumokoy@msn.com

Abstract

Generally consumer taste for meat livestock products related to various aspects of the meat itself that is commonly known such as, color, tenderness, flavor, hygiene and product information about the animal ration that is free of antibiotics, hormones and other substances which interfere the health of consumers. This article aims to describe another aspect which supports the consumer's taste that is lipids molecules content in intramuscular adipose tissue. The higher content of intramuscular lipids will further enhance the consumer taste of this meat product. The methods to detect intramuscular fat content in meat cattle are enzymatic method. This evaluation of the development of intramuscular adipose tissue and the quantification of the lipid content can be used as a parameter for determining the quality of meat products of cattle in improving the organoleptic value of livestock meat products in the market.

Keywords: lipids, adipose, intramuscular, cattle meat.

1. Introduction

The access to information about the progress of science and technology, in the field of food derived from animals, have an impact on the selective pattern of the consumer. This is reflected in many developing countries shows that consumers meat livestock products, increasingly understand the quality and selective in consuming the meat from cattle

The need of consumer to animal protein derived from animal meat continues to grow in line with the increase of population in almost of all countries in the world.

Therefore it is important to be required the provision of cattle meat quality and safe for consumer health. This is a concern for livestock meat producers who continually work to improve the quality of meat products to be competed for getting maximum of sale value in market. The competition in the international market encourage suppliers to pay attention the quality of the meat of cattle are marketed, in the face of the free market in the ASEAN region which effectively began in late 2015.

2. Meat Quality Assessment

In many regions, pork became an important source of meat cattle. Meat products in the market of freely contained in various forms, namely in the form of fresh meat, preserved meat, or meat that has been processed and marketed in various packaging.

Meat quality can be assessed from several benchmarks such as color, flavor, and tenderness. High quality meat products will have an impact on the sale price in the market. In addition, the emergence of rules that control the use of hormones and feed additives non-nutritive such as antibiotic because these residues may have a negative impact for consumers. Therefore it is needed farmer's efforts in producing meat quality for consumers, for example by increasing the fat intramuscular content, because the fat content in meat responding flavor for consumers.

According to the Codex Alimentarius Commission (FAO, 1992) has elaborated (besides meat inspection Codes) the Recommended International Code of Hygiene Practice for Fresh Meat (CAC/RCP 11976) and the Recommended International Code of Hygienic Practice for Poultry Processing (CAC/RCP 14-1976) which describe the minimum

requirements of hygiene for meat and poultry production. There are seven targets point from these codes:

a) that the food will not cause infection or intoxication when properly prepared; b) does not contain residues (of pesticides, veterinary drugs and heavy metals) in excess of established limits; c) is free from disease; d) free from obvious contamination; e) free from defects generally recognized as objectionable; f) has been produced under adequate hygienic control; g) fulfils the expectation of the consumer in regard to composition. In point of view of fat quantity contained in meat animals of a species, it depends on various factors such as age, health condition of livestock, the type and amount of feed consumed regularly by animals. Adipose tissue is a tissue composed of adipocytes cells that responsible for the accumulation of body fat mass in animals, including those in the meat tissue. This network *Perekembangan* impact on the quality of the meat itself.

Several Factors Affecting the Quality of Livestock Meat Products

There are several factors which affecting the animal meat quality as following factors: genetic, nutritive content in feed, quantity of feed consumption, health and hygiene. Brockwell *et al.*, (2014), reported helminthes in meat has high risk to be infected to consumers. This condition is confirmed by Wilson (2008) there are various zoonotic pathogens agents in meat that cause serious illness in consumers, and therefore it is necessary to control the contamination from pathogenic microbes. On the other hand the content of non-biological substances in meat can be a barrier in the quality of the meat. Other substance reported by Mamani *et al* (2009) are antibiotics or others non-nutritive additive. Fat content in meat has a key role in determining the quality of meat because besides associated with flavor and also related to the health of the consumer. It should differentiate between the masse of meat and adipose tissue. When the adipose tissue reaches the level of 'adult' then this adipose began to function in the metabolism of fat concerning the synthesis, hydrolysis and accumulation of fat.

The Fat Content as Determinant Factor in Meat Quality

According to Mourout and Hermier (2001) the intermuscular fat, associated with connective tissues separating median and deep muscular plans, represents 30% of the separable adipose tissues. The content of fat in adipose tissue is a conse-

quence of adipose function to accumulate excess energy in the form of fat in the body that causes the body to become fat (Rumokoy, 2012). Activity of adipose tissue associated with the elements of species, breed livestock, body condition, the type and amount of food eaten (Webb and O'Neill, 2008). Today the amount of intramuscular fat content has been a determinant of quality meat. When viewed from the human health, the saturation of fatty acids. Intermuscular fat, associated with connective tissues separating carcass is merchandised after direct transformation (ham) or after mincing and mixing in the preparation of different lean and fat tissues (Mourout and Hermier, 2001).

Hocquette *et al.*, (2010) has reported that the amount of intramuscular fat (IMF) and its fatty acid composition play major roles in the quality attributes of meats, including sensory properties and healthy considerations. It is generally assumed that IMF content positively influences sensory quality traits, including flavor, juiciness and tenderness of meat or firmness of fish, whereas a low amount of fat induces a less tasty meat. To count the intramuscular fat percentage is a complex trait, and therefore is required to demonstrate significant interactions among treatments, genetics, and IMF% (Bolormaa *et al.*, 2011).

Conclusion

Intramuscular adipose tissue metabolism function determines the amount of meat fat animal products, and became an important factor in terms of quality meat flavor of the product. Most of the fat that accumulates in the amount of intramuscular fat is the result of excess energy contained in food consumed by livestock.

References

- FAO. 1992. Meat and meat products in human nutrition in developing countries. Rome. Italy.
- Bolormaa S, LR Neto, YD Zhang, RJ Bunch, B E Harrison, ME. Goddard, and W. Barendse. 2011. A genome-wide association study of meat and carcass traits in Australian cattle. *J. Anim. Sci.* 89:2297-2309.
- Brockwell YM, TP Elliott, GR Anderson, R Stanton, TW Spithill, NC Sangster. 2014. Confirmation of *Fasciola hepatica* resistant to triclabendazole in naturally infected Australian beef and dairy cattle. *International Journal for Parasitology: Drugs and Drug Resistance* 4 (2014) 48-54
- Hocquette JF, F Gondret, E Baéza, F Médale, C

- Jurie and D W Pethick 2010.** Intramuscular fat content in meat-producing animals: development, genetic and nutritional control, and identification of putative markers. *animal*, 4, pp 303-319. doi:10.1017/S1751731109991091.
- Mamani MCV, Reyes FGR, Rath S. 2009.** Multiresidue determination of tetracyclines, sulphonamides, and chloramphenicol in bovine milk using HPLC-DAD. *Food Chem.* 117:545 – 552
- Mourot J and D Hermier. 2001.** Lipids in monogastric animal meat. *Reprod. Nutr. Dev.* 41:109-118.
- Rumokoy LJM. 2012.** Precursor Adipocyte Development As Media of Lipid Metabolism. *Jurnal Lasallian* Vol 9, 1:25-31.
- Webb EC and HA O'Neill. 2008.** The animal fat paradox and meat quality. *Journal of Meat Science.* Vol 8, 1:28-36