

Potential of Local Microalgae as A Natural Antioxidant to Produce *Asuh* Broiler Meat

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Abstract— Feed quality for food safety. To produce ASUH (safe, healthy, whole and halal) food from broiler, it should be fed with quality ration that free from chemical residues derived from synthetic antioxidants such as BHT, BHA and antibiotic for the meat contained residue that will cause negative effect. Microalgae has the potential to be used as natural supplement because it contains nutrients, antioxidant, cholesterolemic effect and plant growth regulator. Objectives of this study is to exploit natural antioxidant substance in local microalgae extract as natural supplement for broiler. This research used local microalgae collected from water of the pond located around chicken farm in Nagari Mungka, 50 Kota District. DPPH free radical absorbance method used to test antioxidant activity, while ascorbic acid (Vitamin C) used as comparison, and was tested to broiler to oversee its performance. Best concentration tested to broilers and its performances was observed. The result of study; Local microalgae extract has ability to inhibit DPPH free radical by concentration at 80 µg/ml which is equal to 6 µg/ml of Vitamin C. The performance after giving microalgae as antioxidant is better than Vitamin C because it contains nutrition and others secondary metabolic such as antimicrobial, cholesterolemic effect and plant growth regulator. Local microalgae is potential as source of natural antioxidants for producing ASUH broiler meat

Keywords— Microalgae, Antioxidant Activity, ASUH Chicken Meat.

I. INTRODUCTION

This Feed quality for food safety. To produce ASUH (safe, healthy, whole and halal) food from broiler, it should be fed with quality ration that free from chemical residues derived from synthetic antioxidants such as BHT, BHA and antibiotic for the meat contained residue that will cause negative effect. Broiler meat is one food that is declared less safe for consumers because it is assumed to contain high cholesterol and chemical residues derived from feed additive which added to commercial rations in order to trigger the growth of chickens and as a preservative. The residue of feed additive left inside the chicken and this will trigger the development of a disease such as hypertension, coronary heart disease and cancer for those who consume it.

Considering the dangers of chemical residues, there should be an exploration of the natural ingredients that are safer to feed supplement. Many reports say that microalgae contains active compound such as antibiotic, antiviral, cytotoxic and antimutagenic activities. Microalgae is known to contain antioxidant molecules, such as ascorbate and

glutathione (GSH), including carotenoid (Yuan et al, 2005). Microalgae has the potential to be used as natural antioxidant. It also contains nutrients, cholesterolemic effect and plant growth regulator (Kamase, 2007). Thus, the objectives of this study is to exploit natural antioxidant substance in local microalgae extract as natural supplement for broiler.

II. MATERIAL AND METHOD

This research used local microalgae collected from water pond located around chicken farm in Nagari Mungka, 50 Kota District. DPPH free radical absorbance method used to test antioxidant activity by Vachos et al (1996). while ascorbic acid (Vitamin C) used as comparison, and was tested to broiler to oversee its performance. The examination of antioxidant activity on local microalgae with concentration; 10 µg/ml, 20 µg/ml, 40 µg/ml, 60 µg/ml, 80 µg/ml dan 100 µg/ml. Concentration of ascorbic acid are: 1 µg/ml, 2 µg/ml, 3 µg/ml, 4 µg/ml, 5 µg/ml dan 6 µg/ml. A 10 mg extract dissolved with 10 ml methanol in a 10 ml

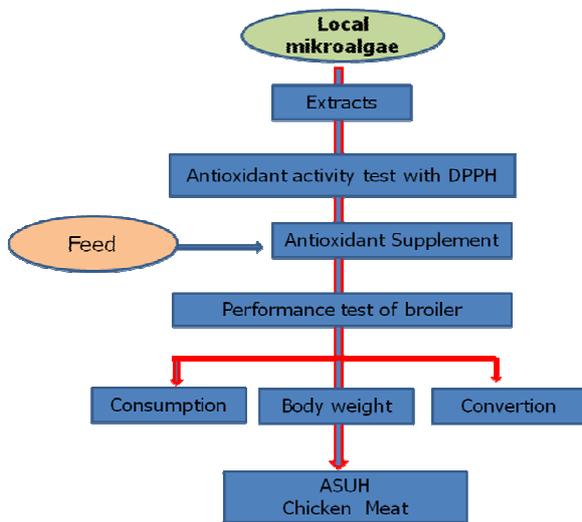


Fig. 1. Research Flow Chart

erlemeyerad to produce 1 µg/ml concentration. Methanol was added to dilute it in order to get sample with vary concentration (10, 20, 40, 60, 80 dan 100 µg/ml). The determination of antioxidant activity of each concentration done in micro pipette and pour it into the vial. Then, a 3.8 ml DPPH 50 µM solution added. The mixture was homogenized and stored in dark room for 30 minutes. The absorbance measured by means spectrofotometer UV-VIS at 515nm wave length. Ascorbic acid (concentration 1,2,3,4,5,6 µg/ml) used as comparison.

Best concentration tested to broilers and its performances was observed. There were 75 DOC broilers used as sample

of the research. Best concentration of microalgae gained from DPPH free radical inhibition test, which is biologically tested and its performance was observed. As comparison Vitamin C with equivalent concentration with above test result used. The Complete Random Design with 3 treatments and 5 replication used in this research.

Sample antioxidant activity was determined by the rate of DPPH free radical absorbance inhibition by calculating the percentage of DPPH absorbance inhibition using the following formula:

$$\% \text{ Inhibition} = \frac{\text{Abs control} - \text{Abs Sample}}{\text{Abs Control}} \times 100 \% \quad (1)$$

Explanation:

Abs control : 50 µM DPPH free radical absorbance at 515 nm wave length.

Abs sample : sample absorbance to 50 µM DPPH free radical at 515 nm wave length.

Result data of biological test processed with mini Tab software.

III. RESULTS AND DISCUSSION

A. Antioxidant activity

Table 1 shows antioxidant activity of micro algae extract and Vitamin C using DPPH method while Table 2 exhibits performance of broiler given microalgae supplement for 4 weeks.

TABLE I
ANTIOXIDANT ACTIVITY OF LOCAL MICROALGAE (CONSORTIUM) EXTRACTS

Comparison	Concentration µg/ml	Absorbance	% Inhibition
Microalgae	10	0,238	57,64
	20	0,191	65,83
	40	0,143	74,55
	60	0,118	78,94
	80	0,045	89,56
	100	0,041	92,88
Vitamin C	1	0,322	23,34
	2	0,314	33,88
	3	0,297	49,55
	4	0,189	54,01
	5	0,109	79,86
	6	0,062	88,25

Local microalgae extract has ability to inhibit DPPH free radical by concentration at 80 µg/ml, which is equal to 6 µg/ml of Vitamin C. The performance after giving microalgae as antioxidant is better than Vitamin C because it contains nutrition and others secondary metabolic such as

antimicrobial, cholesterolic effect and plant growth regulator.

TABLE I
PRODUCTION OF ASUH BROILER NEAT RAISED FOR 4 WEEKS

Component	Feed Consumption	Body Weight	Feed Conversion
Non supplement	1578,00 a	1075,00 a	1467,00 a
Local microalgae	1587,00 a	1313,00 b	1212,00 b
Vitamin C	1654,00 a	1275,00 ab	1297,00 c

Mean values with different superscripts in the same column are significantly different ($p \leq 0.05$)

IV. CONCLUSIONS

Local microalgae is potential as source of natural antioxidants for producing ASUH broiler meat.

REFERENCES

- [1] Angka. T.Socharto.2000, Pengaruh konsentrasi nutrisi terhadap pertumbuhan dan produktivitas *Chlorella* sp.pada kultur semikontinyu. LIMNOTEK 2(1) (1994) 33--43.
- [2] Anonim. 2004. *Porphyridium cruentum* composition. www.necton.pt/Algae, 11 mei 2004
- [3] Basmi, J., 1994. Blooming Fitoplankton, Fakultas Perikanan, Institut Pertanian Bogor, Bogor.
- [4] Becker FW. 1994. Microalgae biotechnology and microbiology. New York: Cambridge University Press.
- [5] Borowitzka MA, Borowitzka LJ. 1988. Mikroalgal biotechnology. Cambridge: Cambridge University Press.
- [6] Borowitzka. al. 1998. An antibacterial and antiviral produced by *Enterococcus mundtii* ST4V isolated from soya beans. Int. J. of Antimicrobial Agents 25: 508-513
- [7] British Pharmacopeia commission. 1993. British pharmacopeia. Vol. II. London: Her Majesty's stationery office;. hal. 167-8.