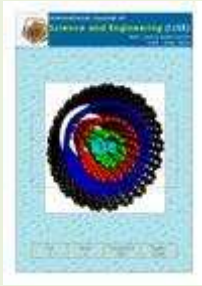
International Journal of Science and Engineering (IJSE)

Home page: http://ejournal.undip.ac.id/index.php/ijse



Profile Triglycerides Japanese Quail (Coturnix coturnix japonica) After Giving Turmeric (Curcuma longa) Powder

Sukarman Hadi Jaya Putra[#)], Tyas Rini Saraswati[##)], Sri Isdadiyanto[##)]

[#)]Department Of Master Biologi. Faculty Of Science and Mathematics, Diponegoro University. Semarang
[##)]Department Of Biologi. Faculty Of Science and Mathematics, Diponegoro University. Semarang

Email: sukarmanhjp@yahoo.co.id

Abstract *- The purpose of this study was to determine the triglyceride profile of Japanese quail (Coturnix coturnix japonica) after being given the parameters of turmeric (Curcuma longa) powder; feed intake, profiles of liver triglycerides, profiles of serum triglycerides and profiles of meat triglycerides. This study uses an experimental method with A Completely Randomized Design Pattern. Test animals used were 45 female Japanese quails were divided into 3 groups, namely; P0: quail were not given turmeric powder, P1: quail were given turmeric powder a dose of 54 mg/quail/day, P3: quail were given turmeric powder a dose of 108 mg/quail/day. Each group with 5 replications. Each repeat consists of 3 Japanese quails. Provision of treatment every day for 30 days starting from the age of 14 days. Data were analyzed using analysis of variance (ANOVA) followed by Duncan's test with 95% confidence interval (α = 0.05 level). Analysis of the data used is software Minitab software 16. Results showed that the levels of turmeric powder are given in Japanese quail significant (P<0.05) on liver triglyceride levels, serum and Japanese quail meat but had no significant effect (P>0.05) on consumption feed. The results showed that the optimal dose of turmeric powder to lower triglyceride levels of Japanese quail is 108 mg/quail/day as evidenced by the highest decrease in liver triglyceride profiles, profiles of serum triglycerides and triglyceride profiles of Japanese quail meat compared with other treatments.*

Keywords—*Turmeric (Curcuma longa), Japanese quail (Coturnix coturnix japonica), Triglycerides*

Submission: October 3, 2014 Corrected : December 1, 2014 Accepted: December 27, 2014

Doi: 10.12777/ijse.8.1.65-68

[**How to cite this article**: Putra, S.H.J., Saraswati, T.R., Isdadiyanto, S. *2015.* Profile Triglycerides Japanese Quail (Coturnix coturnix japonica) After Giving Turmeric (Curcuma longa) Powder, *International Journal of Science and Engineering*, *Vol. 8(1),65-68* . **Doi**: 10.12777/ijse.8.1.65-68

I. INTRODUCTION

Nutritional needs of the people of Indonesia have increased. Animal protein is a major factor determining the level of social welfare. Distribution of energy consumption patterns in Indonesia is 9-14% energy protein, 24-36% energy fat, and 54-63% carbohydrate energy. The distribution was not as expected is 5-15% energy protein, 25-55% energy fat, and 40-60% carbohydrates. One example of nutritional needs, especially protein seen in the development of egg consumption in Indonesia. Availability of eggs from 2009 to 2012 has increased the 903 thousand tons to 1.06 million tons, and is predicted to increase in the next year to reach 1.14 million tons in 2014 (Respati *et al*., 2013).

Japanese quail (*Coturnix cuturnix japonica*) became one of the livestock sector is efficient in providing good protein derived from eggs and meat, because it is a food with high animal sources. Advantage in raising quail, which is the age of six weeks of quail (*Coturnix cuturnix japonica*) already in production, does not require a large capital, easy maintenance and can be cultivated on a limited land (Nixon, 2008).

Protein content of 13.1% and 11.1% fat in quail better than other poultry, such as chicken and duck (Tuti, 2012). The high fat content in Japanese quail is one of the causes of the lack of interest of the community to consume quail, both Japanese quail eggs and meat.

Lipids in the body comes from the feed along with proteins and carbohydrates. In cells, lipids packaged in the form of triglycerides. Triglycerides are the most common fat found in quail. Carbohydrates are synthesized to produce energy, the excess carbohydrates are stored in the form of meat and lipid dii abdomen. Protein cholesterol and triglycerides with an vitolegenin forming materials Vitolegenin synthesized in the liver that is packaged in the form of VLDL, then transferred to the follicle in the ovary and ocumulated as egg yolk or vitolegenin (Salvante *et al*., 2007). The content of phytoestrogens in turmeric can stimulate the hormone estrogen in synthesizing vitolegenin (Ravinder *et al*., 2007). Vitolegenin induced by the hormone estrogen (Yamashita *et al*., 2011), then transported via the blood to the oocyte for follicle development (Ito *et al*., 2003). Oocyte growth followed by an increase in oocyte accumulation vitolegenin.

Powdered turmeric (*Curcuma longa*) is one supplement that can affect the lipid profile and cholesterol. Curcumin in

turmeric powder (Curcuma longa) serves as a hepatoprotective (Kohli *et al*., 2005). Curcumin was given orally will be absorbed and metabolized in the intestine and liver (Sandeep *et al*., 2010). This indicates that curcumin has a role as a hepatoprotective. Supplementation of turmeric powder (*Curcuma longa*) on feed quail (*Coturnix cuturnix japonica*) of 54 mg / head / day with a curcumin content of 7.97% before cooking sex can improve lipid metabolism, distribution to various organs via enterohepatic recirculation, ovarian follicles and reduces abdominal fat and lower cholesterol levels in the blood and eggs (Saraswati *et al*., 2013).

The purpose of this study was to determine liver triglyceride profiles, serum triglyceride profiles, and meat triglyceride profiles after being given turmeric powder.

II. MATERIALS AND METHODS

1. Times and Place Of Research

This research starts from April to August 2014 in the test Animals Maintenance Structure and Function Laboratory Animal Biology Department of Biology, Faculty of Science and Mathematics University of Diponegoro, testing serum triglyceride levels (Bekal *et al.*, 2011), liver and Japanese quail meat (Elwakked *et al*., 2012) is done in WAHANA Laboratory, Semarang with GPO_PAP method.

2. Materials and Tools

The material used is a female Japanese quail, quail standard feed, and kits for the analysis of triglycerides. The tools used were analytical balance, dissecting sets, centrifuge, spectrophotometer, ovens, and atomic absorption spectrophotometer.

3. Research of Method

Japanese quail by decapitasi the jugular vein. Blood is collected in a test tube, left to stand for 2 hours. Blood was centrifuged at 2000 rpm for 15 minutes. Serum obtained for testing serum triglycerides. The meat was taken from the right chest with a size of 2x2 cm, the liver was taken from the right locus with size 1x1 cm (Laemmli, 1970). Triglycerides were measured in serum , liver , and meat with GPO - PAP methods. The enzyme glycerol - 3 - phosphate in the enzymatic GPO - PAP will be hydrogen peroxide oxidizes triglycerides, and then reacted with 4- Aminoantypyrin and P -chloropenol form quinoneime pink . Intensity can be measured using a spectrophotometer

The experimental design used was a Completely Randomized Design (CRD) with 3 treatments and 5 replications. 45 Japanese quails were divided into 3 groups: P0; quail without given turmeric powder, P1; quail were given turmeric powder 54 mg / head / day, and quail were given turmeric powder 108 mg / head / day, each treatment contained 3 replicates Japanese quails. Data were analyzed using Analysis of Variance (ANOVA) and Duncan's test followed by a 95% confidence interval ($\alpha = 0.05$). Overall analysis using the software Minitab 16 (Mattjik and Sumertajaya, 2006)

4. Parameters Of Research

The parameters measured were the levels of triglycerides in serum, liver, quail meat and feed consumption. significant effect ($P<0.05$) on feed consumtion, but significant levels of turmeric powder $P <0.05$ against liver triglyceride profiles, serum triglyceride profiles, and meat triglyceride profiles of Japanese quail.

III. RESULTS AND DISCUSSIONS

Average feed intake, liver triglyceride profiles, serum triglyceride profiles, and meat triglyceride profiles of Japanese quail meat is presented in Table 1. Results of the analysis showed that the levels of turmeric powder had no

Table 1. Profile Of Triglycerides In The Liver, Serum And Meat Of Japanese Quail Were Given Treatment Turmeric Powder

Tumeric powder	P0	P1	P2
Parameters	(0 mg/quail/day)	(54 mg/quail/day)	(108 mg/quail/day)
Feed intake	20.70±0.91	20.17±1.07	19.87±0.39
Liver triglicerides	119.16±7.85^{a}	108.41±3.63^{b}	99.63±2.46^{c}
Serum triglicerides	77.23±1.61^{a}	62.61±2.84^{b}	49.93±1.02^{c}
Meat triglicerides	42.52±2.89^{a}	39.74±2.19^{ab}	37.81±2.22^{b}

Description: Different rank indicates a significant difference in each column

Given turmeric powder had no significant effect ($P>0.05$) on feed consumption. Feed consumption in the three kinds of turmeric powder levels showed no difference. Mean feed intake of Japanese quail when treatment is 20:24 g/head/day. This is consistent with the results of Saraswati et al. (2013), turmerzic powder supplementation had no significant effect ($P<0.05$) on feed consumption, due to the bitter taste of saffron does not affect palatibilitas feed.

Turmeric powder significantly ($P<0.05$) on liver triglyceride levels. The more powdered turmeric is given in the Japanese quail to 108 mg / head / day, liver triglyceride profile of Japanese quail is getting low. Quail were given turmeric powder has the most triglyceride levels relative low of 99.63 mg / dl, while the quail that were not given turmeric powder had the highest relative triglyceride profile is 119.16 mg / dl. Provision of turmeric powder can improve liver function to synthesize vitolegenin, then vitolegenin transported to the growth ovarian follicular hierarchy (Elnagar and Elhady, 2009). The more follicles are formed, means more triglycerides into vitolegenin enabled. Saraswati et al (2013a) explains that the more supplements turmeric powder are given more and more growing follicles hierarchy. This explains that the turmeric powder vitolegenin able to induce synthesis in the liver, resulting in liver triglyceride metabolism is increased.

Turmeric powder significantly ($P<0.05$) on serum triglyceride profile. Quail were not given turmeric powder has the most serum triglyceride profile is relatively high at the 77.23 mg / dl, whereas quail fed 108 g / head / day of turmeric powder has a relatively serum triglyceride profile is at least

49.93 mg / dl. Saraswati et al (2013) reported that the increase of turmeric powder supplements to 54 g / day / head causes a decrease in serum triglyceride profile. Decrease in triglycerides caused by the activity profile of curcumin that plays a role in lipid metabolism (Graham, 2009), due to an increase in lipoprotein lipase activity which would then be absorbed by the cells (Watson, 2002).

Turmeric powder significantly ($P<0.05$) on triglyceride profiles meat. Quail were given turmeric powder has the most meat lowest triglyceride profiles ie 37.81 mg / dl, whereas quail without turmeric powder has the most high profile flesh ie triglycerides 42.52 mg / dl. This shows that an increase in the metabolic activity of curcumin in the spur is in the meat. Fat stored in the meat used optimally for the provision of materials in synthesis vitolegenin.

Powdered turmeric significant effect on liver triglyceride profile, serum, and Japanese quail meat, but did not significantly affect feed intake. Low levels of liver triglycerides, serum and meat in Japanese quail were given a dose of turmeric powder at most shows that triglycerides in the liver profile, serum and meat inversely proportional to the number of doses given turmeric powder supplements on feed. The higher dose of turmeric powder supplement that given that to 108 mg / head / day decreasing effect on triglyceride profiles contained in the liver, serum, and Japanese quail meat. This is shown in the graph in Figure 2. Decrease in liver lipid profile, serum, and the meat is very real.

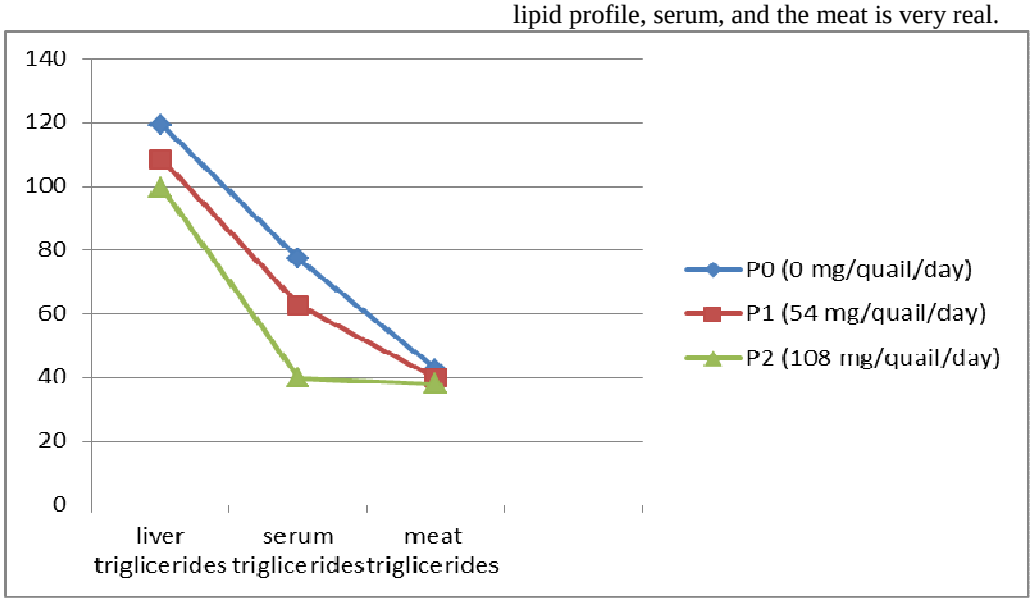


Figure 2. Profile of Triglycerides In The Liver, Serum and Meat of Japanese Quail (Coturnix-Coturnix Japonica) After Administration of Turmeric (Curcuma Longa) Powder.

Carbohydrates contained in the feed portion and partially converted into energy stored as fat, one of which is a triglyceride. curcumin plays a role in increasing the synthesis vitolegenin. Cholesterol and triglycerides are necessary ingredients in the synthesis vitolegenin. Liver package and secrete triglycerides and cholesterol, and protein in the form of VLDL particles, through endocytosis used to prepare the yolk (Waston, 2002) [19]. Vitolegenin synthesis occurs in the liver, which then flowed through the blood to the ovaries. Saraswati (2013) [10] states that the higher the turmeric powder supplements were given in Japanese quail causing more and more number of eggs produced. This is evident from the large number of hierarchy mature follicle.

IV. CONLUSIONS

Liver triglyceride profiles, serum triglyceride profiles, and meat triglyceride profiles most low contained in quail fed turmeric powder which is the most widely turmeric powder dose 108 mg / head / day, but do not affect the consumption of turmeric powder feed.

ACKNOWLEDGMENT

The author would like to say thank you to the management board and staffs Laboratory of Maintenance Structure and Function Animals, Department of Biology, Faculty of Science and Mathematics. Diponegoro University.

REFERENCES

Bekal M, Kumari S, Vijay R, Pushpalath KC. 2011. Research Journal Of Pharmaceutical, Biological and Chemical Science A Study On Lipid Profile And Myeloperoxidase Level In Type Ii Diabetes Mellitus With Respect To Age And Gender. RJPBCS 2(1):336.

Elnagar S and Elhady AM. 2009.Exogenous Estradiol: Productive And Reproductive Performance And Physiological Profile Of Japanese Quail Hens. International Journal Of Paultry Science 8(7):634-641.

Elwakked ASE, Alazhary DB, Mohamed S, Elzayat SR, Hebishy MA. 2012. The Enhancement Effect Of Administration Of Caffeine In Combination With Green Tea And Its Component On Lipid Profile Element In Obese Rats. New York Scince Journal 5(6).

Graham A. 2009. Curcumin Adds Spice To the Debate: Lipid Metabolism In Liver Disease. J,Pharmacol 157(8): 1352-1353.

Ito Y, Kihara M, Nakamura E, Yonezawa S, Yoshizaki N. 2003. Vitolegenin Transport And Yolk Formation In Quail Ovary. Zoological Science 20:717-726.

Kohli K, Ali J, Antasari MJ, Rahemen Z. 2005. A Natural Antiinflamoatory Agent. Education forum 37(3):141-147.

Laemmli U.K. 1970. Cleavage Of Structural Proteins During The Assembly Of The Head Pf Bacteriophage T4. Nature 227:680-685.

Mattjik AA, Sumertajaya IM. 2006. Perancangan Percobaan dengan Aflikasi SAS dan MINITAB. Ed ke-3. Bogor:IPB Press.

Nixon TM. 2008 Sukses Beternak Puyuh. Penerbit Agromedia Nusantara. pp. 105-107.

Ravinder PN, Babu KN, Sivaraman K. 2007. Tumeric. The Genus Curcuma. CRC Press London, New York. pp. 375-376.

Respati. dkk. 2013. Bulletin Konsumsi Pangan. Pusat Data dan System Informasi Pertanian. Vol. 4 no. 2.

Salvante KG, Lin G, Walzem RL and Williams TD. 2007. Characterization Of Very-Low Density Lipoprotein Particle Diameter Dynamics In Relation To Egg Production In A Passerine Bird. The journal of experimental biology 210:1064-13-56.

Sandeep GK, Amit L, Vinay J, Siddartha G, Jyoti, Anju K. 2010. Phytochemistry of Curcuma Longa-an Overview. Journal of Pharmaceutical and Biomedical Science. Jbpms 4(01):1-8.

Saraswati, Wasmen. M, Damiana. R. E, and Nastiti. K. 2013a. Increased Egg Production of Japanese Quail (Cortunix japonica) by Improving Liver Function Through Turmeric Powder Supplementation. International Journal of Poultry Science. 12 (10): 601-614, 2013. ISSN 1682-8356. © Asian Network for Scientific Information.

Saraswati. 2013. The Role Of Turmeric Powder In Lipid Metabolism And Its Effect On Quality Of The First Quail's Egg. Turmeric Effect on Lipid Metabolism and Egg Quality. 38(2)2013p123-130.

Tuti. 2012. Rajanya kolesterol jahat ada di sini. Detikhealth. Diupload vera farah bararah pada Rabu, 08/08/2012 14:57 WIB. Diakses pada tanggal 18 september 2014. http://health.detik.com/read/2012/08/08/145747/1986366/775/rajanya-kolesterol-jahat-ada-disini

Watson RR. 2002. Eggs and Health Promotion. Iowa State Press.

Yamashita R, Oshima A, Baba YH, Wada M, Shibuya K. 2011. Endocrine Distributing Effects Of Low Dose 17 Beta Estradiol (E2) On Japanese Quail (Coturnix Coturnix Japonica) Were Detected By Modified One-Generation Reproduction Study. The Journal Of Toxicological Science (J.Toxicol.Sci) 36(1):43-57.