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The Effect of Fish Meal Substitution with Chicken Viscera in Pig Ration on Blood and Meat Cholesterol, LDL and HDL

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⁴ Abstract

The purpose of this research was to study the effect of substitution of fish meal with chicken viscera in the ration on cholesterol, LDL and HDL content in blood and meat of pig. Fifteen pigs crossbred of Spotted Poland Chinese and Chaster White at 10-week-old with live weight of between 15 and 23 kg, put in individual cages. The treatments were R0 = fish meal 10% + 0% chicken viscera (control); R1 = 5% fish meal + chicken viscera 5%; and R2 = fish meal 0% + 10% chicken viscera. The experimental design used was Randomized Block Design. The variables measured were total cholesterol, LDL, HDL content in blood and cholesterol in pig meat. The results showed that replacement fish meals at 10 % of viscera give good results on all variables measured. Based on this results it can be concluded that at 10% chicken viscera in pig ration could be improved the quality of meat of pork in terms of cholesterol content to ensure human food safety.

Keywords: Fish Meal, Chicken Viscera, Cholesterol, Rations, Pigs

Introduction

A new generation of consumers not only chooses meat products according to perceived eating quality and affordable pricing, but also considers the nutritional value and the ethical quality of the meat, animal welfare issues, and the degree of impact on the environment caused by the production system [1,2]. These are the reasons that in the last few years there has been an increase in demand for foodstuffs obtained from so-called organic, natural or biological livestock production systems [3,4]. Indonesia is a country with 4th larger human population in the world of 260 million peoples after USA, India, and China is the biggest one by 1.3 billion person. In Indonesia human protein consumption per capita per day as follows: from grain 21.69 grams (37.22%), from meat/livestock 3.35 gram (5.91%) and from eggs and milk 3.34 gram (5.89%). National meat chicken or broiler population in 2017 up to figure around at 1.7 billion heads. Common slaughter weight of broiler by 1.2 Kg/head. The component of viscera (tractus digestives, trachea, liver and lung) is around 15% of body weight or equivalent to 180 gram/head. From 1.7 billion head of broiler chicken there is about 360 million Kg production of viscera at national level potential for animal feeds.

Fish meal is one among different source of animal protein for pig ration but it is expensive especially for small holders [5]. A chicken viscus is potential to use as animal feed in pig which is has a

monogastric digestion systems but it is limited information how much this product could be utilized in pig rations [6]. The aim of this research is to study the effect substitution of broiler chicken viscera to replaced fish meal in pig rations on blood cholesterol, LDL and HDL content and meat of pig.

Material and Method

Fifteen pigs crossbred of Spotted Poland Chinese and Chaster White at 10-week-old with live weight of between 15 and 23 kg, put in individual cages. The treatments were substitutions of fish meal with chicken viscera meal as follows R0 = fish meal 10% + 0% chicken viscera (control); R1 = 5% fish meal + chicken viscera 5%; and R2 = fish meal 0% + 10% chicken viscera. Treatment was given to 5 groups of pigs with different body weight each B1 = 16.00 kg; B2 = 18, 10 kg; B3 = 20.25 kg; B4 = 22.50 kg and B5 = 24.10 kg. The experimental design used was Randomized Block Design. To avoid the contamination of intestine content on carcass the animals were fasting 10-12 hours prior to slaughter. The variables measured were total cholesterol content, LDL content, HDL content in blood and cholesterol in pig meat.

¹² Results and Discussion

Table below showed that the total cholesterol content was significant (P <0.05) lower in the treatment of R2 compared with the treatment of R0 and R1 which both were not significantly different.

Table: The effects of substitution of broiler viscera to fish meal on pig ration

Variable	Treatments		
	T1	T2	T3
Blood Cholesterol (mg/100 ml)			
• Total cholesterol	134.2a	126.00a	115.50b
• LDL cholesterol	53.44a	44.00b	36.70c
• HDL cholesterol	58.14a	59.06a	62.24b
Meat Cholesterol (mg/100 gram)	167	153b	129c

Different superscript in same rows is significant difference at ($P < 0.05$).

The LDL content was significant ($P < 0.05$) lower at the treatment of R2 compared with R0 and R1 while the latter two were not significantly different. While the HDL content in the treatment of R2 was significant ($P < 0.05$) higher than the treatment of R0 and R1, followed by the decrease of cholesterol content in meat. The difference impact of utilization of chicken broiler viscera probably due to the nature of fish oil characteristics in fish meal is different those in viscera in term of fatty acids [5].

Conclusions

Based on this results it can be concluded that at 10% chicken viscera in pig ration could be improved the quality of meat of pork in terms of cholesterol content to ensure human food safety.

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