Prosiding

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RUMINANSIA 2010

erkembangan Ternak Ruminansia dan Kontribusinya dalam Program Swasembada Daging 2014"

Semarang, 6 Oktober 2010

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al of the Indonesian Tropical Animal Agriculture (JITAA)
s. Peternakan Universitas Diponegoro, Kampus
dang-Semarang 50275
ax. 024 7474750
te www.fp.undip.ac.id/jppt
jppt.fpundip@gmail.com

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Jalan Drh. Soejono Koesoemowardojo, Kampus Tembalang,
Semarang 50275
Tel./Fax: 024-7474750
E-mail: jppt.fpundip@gmail.com
Web site: www.fp.undip.ac.id/jppt

Editors: Agung Purnomoadi, Aries R Setyawan, Edy Kurnianto, Edy Rianto, Retno Adiwinarti, Siwi Gayatri.

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KATA PENGANTAR

Assalamualaikum wa Rohmatullohi wa Barokatuh

Seminar Nasional Ruminansia kali ini diselenggarakan untuk yang ketiga kalinya, setelah yang pertama tahun 2001, dan yang ke-dua tahun 2004. Seminar ketiga yang seharusnya dilaksanakan tahun 2007 tidak dapat terlaksana hingga tertunda pada tahun ini. Alhamdulillah, pada tahun 2010 ini, seminar nasional Ruminansia dapat terselenggara di tengah permintaan makalah dan tawaran seminar nasional dan internasional bidang peternakan yang terjadwal luar biasa padat. Pada penyelenggaraan kali ini, kami mencoba untuk membantu program swasembada daging 2014 dari sisi kelengkapan ilmu dan kajian teknologi terapan hingga tinjauan soseknya yang dirangkum dalam thema *"Perkembangan Penelitian Ternak Ruminansia dan Kontribusinya dalam Program Swasembada Daging 2014"*.

Pada seminar kali ini kami sengaja tidak mengundang pembicara dari pengambil kebijakan (atau pemerintah), karena rasanya sudah tuntas dibicarakan di hampir setiap seminar nasional. Kami memutuskan mengundang dua pembicara utama yang bersedia berbagi wawasan dan pengalaman keilmuannya yaitu Prof. Dr. Sumadi dari UGM dan Prof. Dr. Toto Toharmat dari IPB. Beliau berdua kami mohon untuk merangkum perjalanan ilmu dan teknologi di bidang pemuliaan dan pakan di Indonesia.

Kami mengucapkan terima kasih atas partisipasi peserta yang datang dari berbagai wilayah di Indonesia. Total makalah sebanyak 41, namun yang dipresentasikan sebanyak 38 makalah. Jumlah peserta sebanyak 120 orang.

Ucapan terima kasih kami sampaikan kepada Dikti yang membantu pendanaan penyelenggaraan terkait dengan hibah penginternasionalan jurnal kami yaitu *Jurnal Pengembangan Peternakan Tropis (JPPT)*. Berkaitan dengan itu pula, pada seminar kali dilakukan *"Launching"* organisasi profesi Masyarakat Peternakan Indonesia atau *Indonesian Society of Animal Agriculture (ISAA)* yang telah diinisiasi pada tanggal 3 Desember 2009.

Prosiding ini berisi tentang makalah-makalah yang telah dipresentasikan, ditambahkan hasil diskusi selama pelaksanaan seminar. Upaya memasukkan hasil diskusi bertujuan menambah kualitas atau bobot prosiding.

Akhir kata, kami berharap semoga prosiding ini bermanfaat bagi yang memerlukannya.

Wassalamualaikum wa Rohmatullohi wa Barokatuh

Semarang, 3 Desember 2010

Ketua Panitia,

Prof. Dr. Ir. Agung Purnomoadi, MSc.

CONTENTS

REDUCING MEAT CHOLESTEROL CONTENT OF LAMB THROUGH THE USE OF FERMENTED PINEAPPLE PEELS

W. Suryapratama, D. Santosa, and F.M. Suhartati
Faculty of Animal Science, Jenderal Soedirman University
Jalan dr. Suparno 12 Karangwangkal Purwokerto 53122
Corresponding E-mail: mas_eo@yahoo.com

ABSTRACT

A research was conducted to evaluate the effects of level fermented pineapple peels in diets on meat cholesterol and lipid of lamb. The pineapple peels was fermented with 3% *Saccharomyces cerevisiae* and 0.5% urea (DM basis). Twenty individually housed thin tail lambs (average 18.93±3.62 kg of body weight) were used in this study. The treatments consisted of level fermented pineapple peels in diets of 0, 10, 20, and 30 % from total concentrate. The diets used consisted of fermented rice straw-concentrate with ratio 30:70. The concentrate contained rice bran, tapioca by-product, pollard, coconut meal, mineral, and salt. After feeding for 60 d in individually crates, lambs were slaughtered 15 h after feeding, and samples of meat from longissimus muscle (LM) were collected. Lipid, CLA (conjugated linoleic acid) and cholesterol concentration were determined for LM. Increasing level of fermented pineapple peels in diets decreased linearly ($P<0.01$) the cholesterol in LM from 143.75 to 57.67 mg/g. There were no different effect of treatment ($P>0.05$) on feed intake, lipid, CLA in LM, and average daily gain (ADG). The use of lamb diets with fermented pineapple peels, up to 30% of the diets, resulted in decreasing level of cholesterol in the LM tissue, without adversely affecting ADG, DM intake, CLA, or lipid LM of lamb. .

Key words: Cholesterol, longissimus, lipid, meat, lamb

INTRODUCTION

Nutritional strategies to lower cholesterol levels of meat can be supplied through long chain poly-unsaturated fatty acid such as linoleic acid (C18: 2) in reticulo-rumen. Fatty acids can be obtained from bioactive fungi. The results of Suhartati *et al.* (2005) study show that the fermentation which uses *Saccharomyces cerevisiae* pollards is able to increase linoleic acid, but the increment is insignificant. Pollard is an energy source that can be replaced by other feedstuffs, which has potential but has not been used optimally. Pineapple peels is one among several agricultural wastes that can be utilized as an energy source, either for livestock or as a substrate for the proliferation of *Saccharomyces cerevisiae*. However, to obtain linoleic acid in sufficient quantity, it still needs to be added a compound capable of supplying a source of linoleic, namely vegetable oil (Flowers *et al.*, 2007) or seed oil (Pavan dan Duckett, 2007). Soybean oil as seed oil, is a good source of unsaturated fatty acids (Kahrizi *et al.*, 2007), able to increase the content of linoleic in the substrate, which will be hydrogenated by rumen bacteria and will produce intermediate compounds, namely conjugated linoleic fatty acids (Scollan *et al.*, 2006), which are very useful for decreasing the content of meat cholesterol. Therefore, the available information about the cholesterol in sheep meat are still very limited, hence the need for a more thorough study, primarily on the use of fermented pineapple peels and soybean oil to produce lamb meat low in cholesterol.

The purpose of this study is to assess the use of pineapple peels fermentation in the diets to body weight gain, total fat content, and cholesterol of lamb meat.

MATERIALS AND METHODS

The study was conducted with experimental methods *in vivo*, using the so-called Randomized Complete Block Design, for which as a group is the initial body weight of lamb. The material used is 20 male lamb aged about 80-10 months, with the initial average

Table 1. Composition of Concentrates and Nutrient Content

Feed Ingredients	Treatments			
	Diet 1	Diet 2	Diet 3	Diet 4
Corn, %	20	20	20	10
Rice bran, %	20	10	4	0
Tapioca by-product, %	14	15	14	14
Pollard, %	25	22	20	25
Coconut meal, %	19	21	20	19
Fermented pineapple peel, %	0	10	20	30
Mineral, %	1	1	1	1
Salt, %	1	1	1	1
Total	100	100	100	100
Sulfur, % concentrate	0.8	0.8	0.8	0.8
Soybean oil, % concentrate	6	6	6	6
Nutrient of diets :				
Dry matter, %	85.98	82.96	79.92	76.92
Crude Protein, % DM	12.21	12.18	12.04	12.09
Crude Fiber % DM	16.9	14.63	12.52	11.61
Ether Extract, % DM	6.65	7.07	7.36	7.65
NFE, % DM	53.16	56.14	59.15	59.8

Table 2. The Average Variables Observed

Variables	Treatments			
	Diet 1	Diet 2	Diet 3	Diet 4
Intake DM, g/d	852,86	749,36	737,40	720,78
Daily gain, g/d	143,81	165,00	163,67	144,29
Fat of meat, %	11,52	18,53	14,88	10,13
Cholesterol of meat, mg/g	143,75[a]	126,06[b]	64,17[c]	57,67[d]

[a,b,c,d] Different superscripts in the same row indicate differences at P <0.01

body weight of 18.93 ± 3.62 kg. As treatment is fermented pineapple peels using 3% of *Saccharomyces cerevisiae* + 0.5% urea, as a mixture of concentrate with a level of 0, 10, 20 and 30% of the total concentrate. The composition of the concentrate and nutrient content of diet are listed in Table 1. Lambs were fed with rice straw ammoniation and concentrates with a ratio of 30:70. Each treatment was repeated five times (five groups of lamb body weight at the beginning of the study).

Measured Variables and Data Analysis

The parameters measured include (1) growth of lamb, obtained by subtracting the final weight with initial weights of the study (in kilograms), (2) total fat content of meat, and (3) cholesterol of lamb meat. Fat is extracted from the Longissimus dorsi muscle section, below the vertebrae 7-8 (Choi *et al.*, 2006). Meat cholesterol levels were analyzed using the method of Plummer (1971) cited Astuti (1997). The data obtained were analyzed using analysis of variance and followed by a polynomial orthogonal test.

Experiment Procedure

The lambs received treatment feed for 60 consecutive days (two months), and they were weighed every week to see its growth, using Nagata digital scales, with a capacity of 150 kg and with a sensitivity of 0.05 kg. Every morning at 6:00 the food and drinking water were cleaned, and food remains were

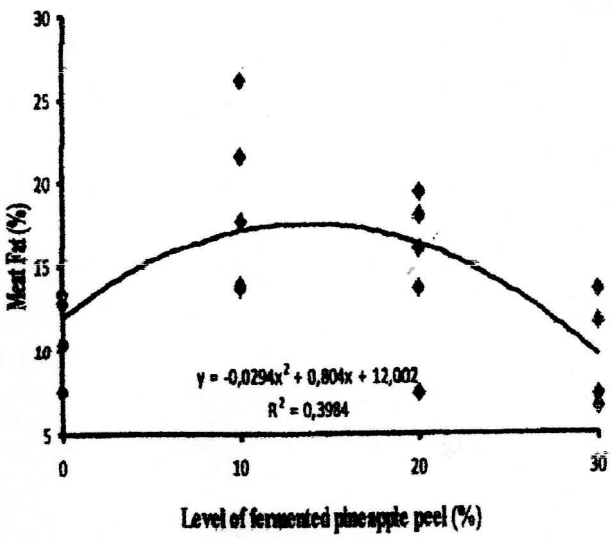

Figure 1. Fat meat response to the level of fermented pineapple peels

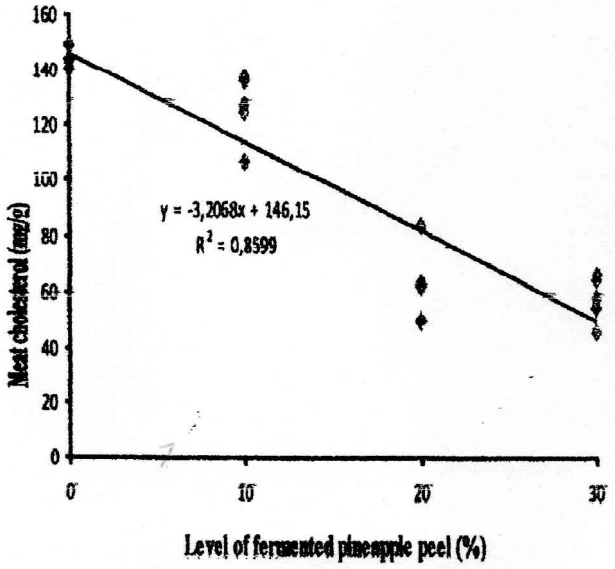

Figure 2. Cholesterol meat response to the level of fermented pineapple peel

weighed. Feed was given three times per day, i.e. morning at 6 a.m., 12 a.m. in the afternoon and evening at 5 p.m. Amount of feed given and the rest of the feed is recorded every day. Drinking Water was given *ad libitum*. Every time treatment feed were mixed, enough samples were taken for proximate analysis. After being maintained for as long as 60 days, the lambs were slaughtered, then meat samples were taken from the Longissimus dorsi part.

RESULTS AND DISCUSSION

Results of the research shows that the average consumption of dry matter on a lamb that received Diet 1 (without additional fermented pineapple peel) 852.86 g/head/day, Diet 2 (plus 10% of pineapple peel) 749.36 g/head/day, Diet 3 (plus 20% of pineapple peel) 737.40 g/head/day and Diet 4 (plus 30% of pineapple peel) 720.78 g/head/ day. Consumption of dry matter per kilogram of body weight of 3.53% for sheep that are not given a fermented pineapple peel, 2.84% for sheep fed with 10% fermented pineapple peel, 2.79% for sheep fed with 20% fermented pineapple peel, and 2.90% for sheep fed with 30% fermented pineapple peels. Daily body weight gain (ADG) of sheep that are not given a fermented pineapple peel (Diet 1) was 143.81 g/head/day, which was given 10% of fermented pineapple peel (Diet 2) 165.00 g/head/day, which was given 20% of fermented pineapple peel (Diet 3) 163.67 g/head/day, and which were given 30% of fermented pineapple peel (Diet 4) 144.29 g/head/day (Table 2).

Results of analysis of variance show that the use of fermented pineapple peels did not have a significant impact ($P>0.05$) on feed consumption, daily body weight gain, but lowered levels of fat and cholesterol of meat significantly ($P<0.01$). Test results of orthogonal polynomials show that the administering of pineapple peels provided quadratic responses to the fat content of meat with the equation of $Y = 12 + 0.804\ X - 0.029\ X^2$, coefficient of determination is 0.398 and peak point (13.86%; 17.57%) (Figure 1), and meat cholesterol with the linear equation of $Y = 146.1-3.206\ X$, coefficient of determination of 0.859 (Figure 2).

This means that with increasing levels of fermented pineapple peel, an increase in the supply of linoleic acid, which will experience bio-hydrogenation in the rumen. During the process of linoleic acid to stearic bio-hydrogenation by *Butirivibrio fibrisolvens* there were intermediate compounds such as conjugated linoleic fatty acid (CLA) (Kritchevsky, 2000). CLA is useful to control body fat and body weight gain (Pariza, 2002), cholesterol-depressing and to lower fat

adipose (Gillis *et al.*, 2004).

CONCLUSION

The use of fermented pineapple peels up to level 30% in lamb diet can reduce fat and cholesterol content of meat.

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Question:

1. Do you measure meat quality in your experiment?
2. Do you analyze CLA in the rumen?

Answers:

1. Yes, We slaughtered the animal and measure for the juiceness. The result showed that Juiceness was decrease due to decreasing cholesterol.
2. No, We did'nd measure the CLA