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by Widayati Trisiwi W

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Use of agricultural by-product in pig ration to reduce feed costin Manokwari Regency, West Papua Province, Indonesia

Widayati T.W., M.N. Lekitoo, D.J.Rahardjo, S.Y. Randa,S. Lumatauw, S.Hartini& B.Santoso

Department of Animal Science, University of Papua,Manokwari, Indonesia

Abstract

The paradigm of modern animal husbandry is based on zero waste concept. The use of agricultural and food industry by-products into valuable materials is an important issue that needs to be done. Pigs are the favorite animals for the Papuan because they are valuable in social, cultural and economical aspects. However, pig farm in papua is constrained by providing concentrate ration because there is competition between pig ration and human food. The aim of this study was to know the potential of agricultural and food industry by-products as constituents of pig ration; and its possibility to reduce feed cost. This study was conducted at Manokwari regency, West Papua Province, Indonesia.The agricultural and food industry by-products used as pig ration constituents were collected from2 traditional market, 5 restaurant and 15 small-scale food industries. The ingredients of ration comprised fish waste, soybean curd, taro skin, soybean skin, restaurant waste and commercial broiler ration.All materials used as ration were proximate analyzed to determine nutrition content. Feed cost was estimated using local market prices. Tabulation was used to analyse the data. Results of this study showed that crude protein and gross energy contents of agricultural and food industry by-products varied4.26 to 31.21% and3432.94 to 4950.57kcal/kg, respectively. Use of agricultural and food industry by-products in pig ration reduced ration cost for phases of pre-starter, starter, grower, non lactation pig, gestation pigand lactation pig by 36.65, 38.58, 46.92, 55.00, 40.59and 65.52%, respectively. It was concluded that agricultural and food industry by-products could be used as an alternative ration in order to reduce cost of ration in Manokwari Regency, West Papua.

Keywords: agricultural by-product, pig, concentrate ration, ration cost, protein, gross energy

Corresponding author: trieswd4@gmail.com

Introduction

Pigs are the favorite animals for the Papuan because they are valuable in social, cultural and economical aspects of their lives. The market demand of this comodity is quite high and become a primary saving for the households. Selling price of this animal is sufficiently high, weaning period price ranged from IDR 1.000.000 to 1.500.000 and that of at the age of cut (8-12 months) varied from IDR 3.000.000 to 5.000.000. So far, pig in Papua has not been intensively raised. The animal are mostly taken as the home consumption, so that aspects of feeding, reproduction and health are not cared properly (Randa, 1994). In general, farmers fed their animals as single feed such as tubers which is of low quality. The minimum amount of feed with low quality are factors that affect the growth of pig to be slow and easy be infected by diseases(Iyai, 2008). Pig is a monogastrict animal, favors concentrate ration and hence compete with human food. This condition caused a problem in feed availibility during intensive pig raising. In additon, the commercial feed is not always available and its price is expensive. Based on BPS Papua Barat Province (2005) that West Papua has abundant forages and agricultural by-product and

potentially for the development of animal husbandry that is 42.442.750 tons produced from the area of 4.244.274 ha.

A good livestock development is adjusted to the availability of feed, socio-cultural conditions and local climate. In fact, the potency market of pig is high, but on the other hand there is still problems in the continuous feed avalability, quality and economic, thus it is necessary to use ingredients from agriculture and food industry by-products as an alternative of pig ration.Based on above reasons, a study was conducted to evaluate potency of agriculture and food industry by products in Manokwari Regency as nutrient source to pig and its ability to subtitute commercial ration in order to reduce ration cost.

Materials and Methods

This study was conducted at Manokwary regency, West Papua Province, Indonesia.The agricultural and food industry by-products used as pig ration constituents were collectedfrom 2 traditional markets, 5 restaurants and 15 food industries. Ingredients used as pig ration were fish waste, soybean curd, taro skin, soybean skin, vegetables waste, waste of restaurant and broiler commercial ration. All ingredients used as ration were proximate analyzed to determine nutritional content. Ration cost was estimated by local market prices. Tabulation was used to analyze the data.

Results and Discussion

Proximate analysis of agricultural and food industry-by products as pig ration constituent presented in Table 1.

Table 1. The Potency and nutrients content of ingredients in pig ration.

No.	Ingredients	Potency (kg/day)	Nutrients Content			
			DM (%)	CP (%)*	GE (kcal/kg)*	ME (kcal/kg)*
1.	Fish waste	1000.00	29.41	31.21	3432.94	2709
2.	Soybean curd	2400.00	14.31	23.85	4950.57	3906
3.	Soybean skin	55.50	15.96	15.1	4022.23	3174
4.	Taro skin	11.40	26.45	4.26	3648.96	2879
5.	Vegetables waste	546.00	9.84	15.8	3683.99	2907
6.	Waste of restaurant	2056.56	35.84	13.72	4202	3315
7.	Commercial broiler ration (CP 11)		87	19.5	-	3100

*Dry matter basis

Two kind of ingredients such as fish waste and soybean curd used in this study were included as protein sources. Skin taro had the lowest CP content (4.6%), whereas the highest CP content obtained in fish waste (31.21%). The agricultural and food industry by-product are abundantly available in Manokwari Regency, however those by-products have not been used efficiently. Verkan (2011) stated that the lost of economic value of food such as vegetables, fish, legumes which caused by inefficiency in retail and consumer in America as much as US$ 197.68 billion per year. Moreover, Kariasa&Suryana (2012) revealed that food availability could be increased by preventing food wastes.

Table 2 shows that the use of agricultural and food industry by-product as pig ration at different stage of production could meet nutrients requirement of pig and provides economical benefit by reducing the cost of the ration.

Table2. Formulation of pig ration using agriculture and food industry by-products at different stages of production.

No	Items	Stages of Production					
		Prestarter	Starter	Grower	Boar and Non Lactation	Gestation	Lactation
1	CP requirement (%)	23.7	20.9	18	13	12.9	16.3
2	ME requirement (Kcal/kg)	3265	3265	3265	3265	3265	3265
3	Dry matter requirement (kg)	0.5	1	1.86	2	1.96	4.31
4	Ration formulation (kg fresh weight)						
	a Soybean curd	1.07	1.95	2.45	1.43	1.79	0.86
	b Soybean skin			0.64	1.82	2.73	0.29
	c Taro skin		0.13	0.37	1.38	1.64	2.29
	d Fish waste	0.19	0.14	0.28			0.13
	e Vegetables waste		1.22	2.69	2.66	3.35	6.26
	f Restaurant waste		0.18	1.29	1.96	0.93	2.59
	g Broiler ration (CP 551)	0.28	0.42	0.38			0.56
5	Total ration as fed (kg)	1.53	4.03	8.09	9.25	10.45	12.98
6	Cost of commercial ration (IDR)	6000	12000	22260	24000	23520	51720
7	Ration cost using agricultural by-product (IDR)	3801.18	7370.1	11816.49	10798.29	13972.62	17831.94
8	Reduction of ration cost (%)	36.65	38.58	46.92	55.01	40.59	65.52

The lowest economic profit was obtained in the use of agricultural and industry by-product as pig ration at prestarter phase where the ration cost was reduced by 36%. Meanwhile, the highest profit was obtained at lactation phase where ration cost was reduced by 65.52% as compared to the use of commercial ration.

Conclusion

Agricultural and food industry by-products could be used as the alternative feeds which are not only favorable in nutrition quality but also help to reduce feed cost of pig in Manokwari Regency, West Papua.

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