

Increasing Farmer Income By Improved Pig Management Systems

(*PENINGKATAN PENDAPATAN PETERNAK
MELALUI PERBAIKAN MANAJEMEN PETERNAKAN BABI*)

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ABSTRACT

This research aims were to increase house hold income of pig farmer by reconstructing of the pig management systems. The methods used in this study were the application of the problem solving techniques through *IPTEKDALIPI* programs. The captured data were all expenses incurred and income received in one pig production period before and after intervention. The results showed that there was a significant increase in the income of the farmer from 31.4% to 38.77%. It could be concluded that the pig farmer's income can be increased through improved management of pig farming systems.

Keywords: pig, income, management.

ABSTRAK

Penelitian ini bertujuan untuk meningkatkan pendapatan keluarga peternak babi dengan melakukan rekonstruksi dan perbaikan pada sistem peternakan babi yang diterapkan. Metode yang diterapkan pada penelitian ini adalah aplikasi dari teknik pemecahan masalah melalui kegiatan *IPTEKDALIPI*. Data yang dikumpulkan adalah total biaya produksi yang dihabiskan selama satu kali periode produksi yaitu sebelum dan sesudah dilakukan intervensi. Hasil menunjukkan bahwa terjadi peningkatan yang signifikan pada penghasilan peternak babi dari 31,4% menjadi 38,77%. Sehingga dapat disimpulkan bahwa penghasilan peternak babi dapat ditingkatkan melalui perbaikan sistem manajemen peternakan babi.

Kata kunci: babi, pendapatan, manajemen

INTRODUCTION

Pig production is an important part in supporting the economy of many countries. The pig population continues to increase from year to year related to the enhancement of private consumption of pork (Mohamadi and Petri, 2006). Pig has an important role for the community as a source of protein, income, employment, savings and fertilizer (Putra *et al.*, 2007). Pig has many advantages over other livestock that the growth rate is fast, easy to breed, easy to find the source of feed and carcass value is high

enough as a provider of animal protein for humans (Nugroho and Whendrato, 1990). Particularly in Bali, pigs are the leading commodity in the community. Most of the people in Bali raising pigs as the main business or sideline in the family. Bali Provincial Animal Husbandry reported the results of a census of pig population in 2011 reached 924 297 pigs (Sumantra, 2011).

The increasing population of pigs in Bali due to the increasing demand for pork and traditional Hindu purposes. Nearly 85% of Balinese are Hinduism where they have a tradition in religious

ceremonies that always require a pig in a relatively large amount. Balinese Hindu community relies heavily on pigs, from birth until the closing of age always needs pigs as a means of their religious, so that the potential of the pig farm in Bali is very good (Wirata, 2014). Based on the potential of pig, the Balinese community assesses that a pig farm is a good business opportunity for them. Almost every family in Bali has pigs, especially those living in rural areas. A side from being a commodity business, for the general population of pigs is also used as livestock that can use waste as a raw material feed kitchen. Which was originally discarded kitchen waste can be used as animal feed pigs which will be sold as extra income communities (Budaarsa, 2014).

In contrast to the potential of pigs in Bali, is still found the problems and constraints faced by pig farmers. Pig farmers in Bali generally apply the conventional scavenging systems, they know how to raise pigs autodidact and a legacy of his ancestors for generations. Very rare farmers who apply the technology in running the farm pigs. They do not understand the importance of the application of technology in terms of breed selection, feed management, maintenance of animal health, equipment and piggery systems, waste management and the marketing of their products (Agustina, 2013). Enhancement of the pig's population was recorded only in terms of an increase in the number of pigs but not followed with improved farm system and the quality of pig and pork produced. Thus applied systems did not provide the maximum benefit for the farmers.

RESEARCH METHODS

This implementation study conducted in pig breeding farm in Abang Village, Karangasem-Bali. Problems of

the farmer were collected by interview and field observed using a set of questionnaires. Four major problems identified: farmer kept local cross breed pigs with small body, slow growth and low feed conversion rate; farmer did not know how to formulate the ration of feed according to the needs of the pig and less attention to the health status. Intervention and accompaniment carried out following methods of *IPTEKDA LIPI* program (science and technology for society program). Production process started from selection of breed of sow candidates such as ten each of Landrace, Duroc and Large White and two boars such as one each of Duroc and Large White; Feed source selection and formulating the ration of feed according to the needs of the pig, rations during pregnancy, lactation, starter, grower and finisher; Guiding the preparation of the animal health program in collaboration with local animal health officers (Agustina *et al.*, 2014).

The captured data were all expenses incurred and income received in one pig production period before and after intervention. Production costs (total expenses) data collected were: feed and additional feed, water, medicine, vaccine, wage, land lease, supporting equipments and electricity. The data of total income collected were: the number of production, the sale of piglets and pigs. All the data analyzed descriptively by statistical program, comparison study before and after intervention analyzed by T test.

RESULT AND DISCUSSION

Detailed research results are presented in Table 1. Breed of pigs were originally local and some local bali crossbreeds replaced by a superior breed that were Landrace, Duroc and Large White. In one production period before intervention, from 25 bali local crossbreed sows in pig breeding farm,

produced 202 piglets, but after introduced by 30 of superior breed of sows, farmer produced 312 piglets.

After replaced by superior breed litter size in the breeding farm significantly increased from 8.8 to 10.9 piglets ($P < 0.01$), while the weaned piglets also rise slightly from 8.08 to 10.4 piglets per sows ($P < 0.01$). The gross benefit earned by the farmer raise sharply from 31.4% to 38.77% ($P < 0.01$).

Increasing in income earned from the prices of piglets, bali local crossbred piglets only sold in average of IDR. 475.000 of each piglet, whereas superior breed piglets were sold in average of IDR 675.000 each. Litter size and the ability of the parenting of sows are the factors that are not inseparable in generating a number of piglets alive at weaning role in the progress of the pig farm (Gobai *et al.*, 2013).

Table 1. Business development on pig farmers in one production process

Farmer	Parameters	Before intervention	After intervention	P value
Breeding farm	Breed of sow	Local and local bali crossbreed	Landrace, Duroc and Large White	
	Number of sow	25	30	0.132 ^{ns}
	Number of piglets (litter size per sow)	222 (8.88)	327 (10.9)	0.000*
	Piglets production (weaning rate per sow)	202 (8.08)	312 (10.4)	0.000*
	Total expenses	IDR. 73.200.000	IDR. 151.760.000	
	Total income	IDR. 96.187.500	IDR. 210.600.000	0.000*
	Gross benefit	IDR. 22.987.500	IDR. 58.840.000	

^{ns}: No significant

*: Significant

Productivity of pigs such as the liter size, born weight, vitality from birth to weaning and weight at birth until weaning can be enhanced by manipulation of feeding and management system, but the changes are temporary and easily restored. Therefore, the productivity improvement through breeding programs needed to be directed in accordance with the objective of improving the advantages that are more permanent (Milligan *et al.*, 2002). This results support previous research that litter size affected the body weight in crossbreed local pigs (Akdag *et al.*, 2009; Wahyuningsih *et al.*, 2012). But the superior breed of pigs had higher number of litter size than local bali crossbreed, larger body size of superior breed of pigs allows more number of fetus without

having to lower birth weight. Many factors influence litter size, these include genetics, gilt management, lactation length, parity distribution, disease, stress and boar fertility (Lawlor and Lynch, 2007; Vidovic *et al.*, 2015).

Feed is the most important costs in pig production (Peng *et al.*, 2007). Shriver *et al.*, (2003); Len *et al.*, (2008) stated that the use of inexpensive feed materials at the proper level will provide economic benefits. At this intervention, farmer guided to find local feed sources which have a good nutritional value for pigs such as soybean hulls, coconut hulls, rice hulls and corn dust. The cost of production has increased significantly, namely 107%. This increase occurred as a result of the improved quality of the feed and the amount of the sows

population and piglets were produced, it also came from health management systems were provided. This study was consistent with previous studies that utilize rice husks at the level of 10% in the diet containing 50% of hotel waste was able to increase total revenues, while the use of rice husk at the level of 30% was able to reduce the cost of pig feed intake (Ariana *et al.*, 2014), the addition of soybean meal in pig feed ration is very important as a source of phosphorus, protein and vitamins E which are needed in the reproductive mechanism (Almeida and Stein, 2010; Gu *et al.*, 2010). With the use of some of these food sources, production costs increased slightly but provide supplemental nutrition, so that the sows are able to reproduce optimally.

Pig is an animal that is susceptible to illnesses caused by bacteria, viruses or parasites. Disease will result in a significant loss on the economics of pig farms (Collins, 2002). Diseases in pigs not only cause harm to farmers but also can threaten human health because of some diseases are zoonoses (Setiawan, 2009; Arizono *et al.*, 2010; Huong *et al.*, 2014). In this research, optimal disease prevention programs have done, vaccinate against *Hog cholera*, *Septicemia Epizootica*, worm medication on a regular basis, the provision of first aid animal health, improve drainage and do improve environmental sanitation. Prevention of diseases and health management systems that would increase the number of pigs weaned (Shankar *et al.*, 2009).

CONCLUSION

Conclusion

It can be concluded that the replacement of sows with superior breed types can improve liter size and weaned piglets. Increased in production costs due to improved feed quality and improved health management will be followed by

improved quality and prices of piglets produced. So in the end the total income of farmers are increased.

Suggestions

The program needs to be continued and spread to change and improve the management systems of pig farms in all around Bali.

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REFERENCES

- Agustina KK. 2013. Identification and prevalence Strongyle type worms in pigs in Bali. *Buletin Vet Udayana*. 5(2): 131-138.
- Agustina KK, AAGO Dharmayudha, IW Wirata, NS Dharmawan. 2014. penerapan sistem peternakan yang efektif dan efisien dengan pendekatan teknologi tepat guna pada peternakan babi di Bali. Laporan Kegiatan IPTEKDA LIPI 2014. Fakultas Kedokteran Hewan Universitas Udayana.
- Akdag F, Arslan S, Demir H. 2009. The Effect of Parity and Litter Size on Birth Weight and the Effect of Birth Weight Variations on Weaning Weight and Pre- Weaning Survival in Piglet. *J Anim Vet Adv*. 8(11): 2133-2138.
- Almeida FN, Stein HH. 2010. Performance and phosphorus balance of pigs fed diets formulated on the basis of values for standardized total tract digestibility of phosphorus. *J Anim Sci*. 88: 2968-2977.

- Ariana INT, Puger AW, Oka AA, Sriyani NLP. 2014. An economic analysis of pigs fed rice hulls in the diet with containing hotel food waste. *Majalah Ilmiah Pet.* 17(2): 71-74.
- Arizono N, Yoshimura Y, Tohzaka N, Yamada M, Tegoshi T, Onishi K, Uchikawa R. 2010. Ascariasis in Japan: Is pig-derived *Ascaris* infecting humans? *Japan J Infect Dis.* 63: 447-448.
- Budaarsa K. 2014. Potensi ternak babi dalam menyumbangkan daging di Bali. Seminar Nasional Ternak Babi. 2014: 1-18.
- Collins F. 2002. Preventive paracitices in swine: parasite treatment. Veterinary Service, Department of Agriculture, USA.
- Gobai F, Hartoko, Rachmawati. 2013. The correlation among lambing period, litter size and piglet birth weight and at pig farming company, Kedungbenda, Kemangkon, Purbalingga. *J Ilmiah Peternakan.* 1(3): 1114-1119.
- Gu C, Pan H, Sun Z, Qin G. 2010. Effect of soybean variety on antinutritional factors content, and growth performance and nutrients metabolism in rat. *Int J Mol Sci.* 11: 1048-1056.
- Huong VTL, Ha N, Huy NT, Horby P, Nghia HDT, Thiem VD, Zhu X, Hoa NT, Hien TT, Zamora J, Schultsz C, Wertheim HFL, Hirayama K. 2014. Epidemiology, clinical manifestations, and outcomes of *Streptococcus suis* infection in humans. *Emerg Infect Dis.* 20(7): 1105-1114.
- Lawlor PG, Lynch PB. 2007. A review of factors influencing litter size in Irish sows. *Ir Vet J.* 60(6): 359-366.
- Len NT, Lindberg JE, Ogle B. 2008. Effect of dietary fiber level on the performance and carcass traits of mong cai, F1 crossbred (Mong cai × Yorkshire and Landrace × Yorkshire) pigs. *Asian-Aust J Anim Sci.* 21: 245-251.
- Milligan BN, Fraser D, Kramer DL. 2002. Within-litter birth weight variation in the domestic pig and its relation to pre-weaning survival, weight gain, and variation in weaning weights. *Livestock Produ Sci.* 76: 181-191.
- Mohamadi SS, Petri WA. 2006. Zoonotic implications of the swine-transmitted protozoal infections. *Vet Parasitol.* 140:189-203
- Nugroho E, Whendrato I. 1990. Raising pigs. Eka Offset: Semarang. p. 51-55.
- Peng JJ, Somes SS, Rozeboom DW. 2007. Effect of system of feeding and watering on performance of lactating sows. *J Anim Sci.* 85(3): 853-860.
- Putra I M, Mahalaya S, Kossay L, Ketaren P, Soplanit A, Syaputra AT, Cargill C. 2007. Confining pigs to improve productivity and health. National Seminar BPTP. Papua.
- Setiawan IM. 2009. The infection of triple-reassortant (RH1N1) pig influenza H1N1 virus in human. *Maj Kedokt Indo.* 59(11): 526-536.
- Shankar BP, Madhusudhan HS, Harish DB. 2009. Pre-weaning mortality in pig-causes and management. *Vet World.* 2(6): 236-239.
- Shriver JA, Carter SD, Sutton AL, Richert BT, Senne BW, Petty LA. 2003. Effects of adding fiber sources to reduced-crude protein, amino acid-supplemented diets on nitrogen excretion, growth performance, and

- carcass traits of finishing pigs. *J Anim Sci.* 81: 492-502.
- Sumantra IP. 2011. Bali will not import pigs. *Antara News* 26 Januari 2012 07:44.
- Vidovic V, Lukac D, Visnjic V, Stoisavljevic A, Stupar M. 2015. Effect of different selection criteria for litter size, growth performance and carcass traits improvement of the pigs in Serbia. *Bulgarian J Agric Sci.* 21(3): 687-692
- Wahyuningsih N, Subagyo YBP, Sunarto, Prastowo S, Widias N. 2012. Performance of hybrid piglets based on sow parity. *J Sains Pet.* 10(2): 56-63.
- Wirata IW. 2014. Comparison of *Toxoplasma gondii* cysts predilection in the heart and diaphragm of pig in Bali. *J Sain Vet.* 32(2): 185-190.