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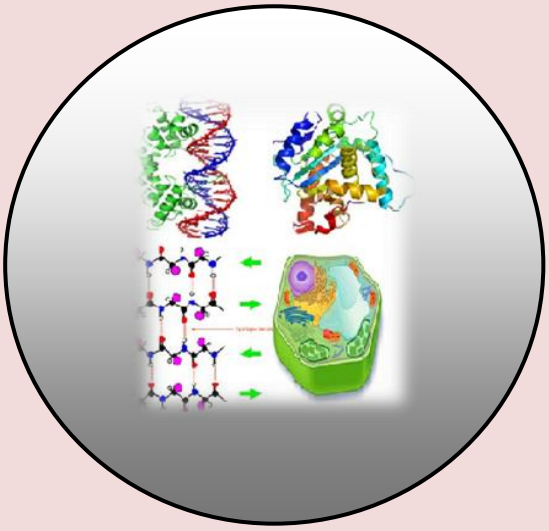

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RESEARCH PAPER

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ABSTRACT

This is a survey research method, which aims to: 1) identify the characteristics of native pig farmers in Nusa Penida Island, and 2) identify the potential of local feeds for native pig farming in Nusa Penida Island. The location of this study was determined by using purposive sampling method, and the farmer respondents were determined by snowball sampling, so there were 90 breeders from 13 villages on Nusa Penida Island. The research data was analyzed by Location quotient (LQ) analysis, analysis of the carrying capacity, and descriptive analysis to describe clearly and in detail about the native pig farming in Nusa Penida Island. The results of this study indicate that the native pig farm are back yard farming handle by housewives, with the main job are coconut oil home industry. Based on LQ analysis, Nusa Penida Sub-district are potential for native pig farming development with LQ 1,299. There are two type of local feed for Bali pig farming in Nusa Penid Sub-district, such as: coconut oil industry's waste and agricultural waste. Local feed availability is sufficient for Bali pig farming development.

Keywords: Bali Pig, Location Quotient, Local Feed and Carrying Capacity.

INTRODUCTION

Population growth and increasing of economic conditions which have an impact on the increasing public demand for food base on animal protein. Economic growth of community in Bali Province at 2015 was recorded at 6.24%, above the average of national economic growth at 5.02%. The average expenditure of the population in Bali Province is Rp. 1,099,561, - / capita / month, increased by 5.21% from the previous year's expenditure. 6.80% of the total population expenditure is used to buy meat (*BPS*, 2017).

Majority of Balinese people religion is Hindu, who is usually use pork for ceremonial and daily consumption. Bali has several of special culinary made from pork, one of them is: suckling pig. Bali pig is one of native pig owned by Bali Province, with a lard type. These types are much recommended to use as a suckling pig. The population of native pig in Bali respectively from 2011-2015 were 272,528, 284,531, 253,841, 244,673, 215,321 and 206.100 heads (BPS, 2017).

Bali pigs are one of livestock commodities that are cultivated in Nusa Penida. In 2016, the population of Bali pig in Nusa Penida was 13,614 (*BPS Kabupaten Klungkung*, 2017). The highly demand of Bali pig as a material for suckling pig is a great opportunity for Balipig farming. But the profiles of Bali pig breeding farm are using a traditional farming system, with a simple management. Farmers doing their business conventionally (Putri, 2018). Animal feed made from: agricultural waste, kitchen waste, and coconut oil processing waste, where the quality and quantity of feed are depending on availability. This condition cause the growth of the Bali pig breeding farm in Nusa Penida are slow, while the demand Bali pigs are increased. To increase the growth of Bali pig breeding farming business, it is necessary to conduct a study of the potential of Nusa Penida Sub-district for development of Bali pig breeding farm. This study result can be used as a guide for farmers and policy holders in Bali pig breeding farming development.

MATERIAL AND METHODS

This research was conducted in Nusa Penida Island, Nusa Penida Sub-district, Klungkung Regency, Bali Province, Indonesia. The location of study was determined using purposive sampling method. Respondent in this study are selected by snowball sampling method. Ninety farmers were selected from thirteen villages in Nusa Penida Island. Primary data were obtained by conducting interviews using questionnaires and in-depth interviews with respondents, and observations in the research area. The secondary data is obtained by searching literatures and related documents.

LQ analysis used to analyze the condition of a region, whether the area is the sector basis or non basis. According to Gibson et al (1991), Hendayana (2003), and Putri (2017) the LQ analysis is formulated as follows:

$$LQ = \frac{vi/vt}{Vi/Vt}$$

Where:

vi = population of Bali pig in Sub-district
vt = population of others pigs in Sub-district
Vi = population of Bali pig in Klungkung Regency
Vt = population of others pigs in Klungkung Regency

Decision criteria:

1. If the LQ value of Sub-district≥ 1, then that Sub-districts the bases area
2. If the LQ value of Sub-district y <1, then that Sub-districts the non basesarea

Characteristics of Bali pig breeding farmers in Nusa Penida Sub-district were analyzed by descriptive analysis. Carrying capacity analysis is carried out by observing the potential of local feed availability to support Bali pig breeding farm development in Nusa Penida Sub-district.

RESULT AND DISCUSSION

Analysis of the Regional Potential for Bali Pig Breeding Farm

Non-ruminant livestock commodities in Nusa Penida Sub-district are dominated by Bali pigs.

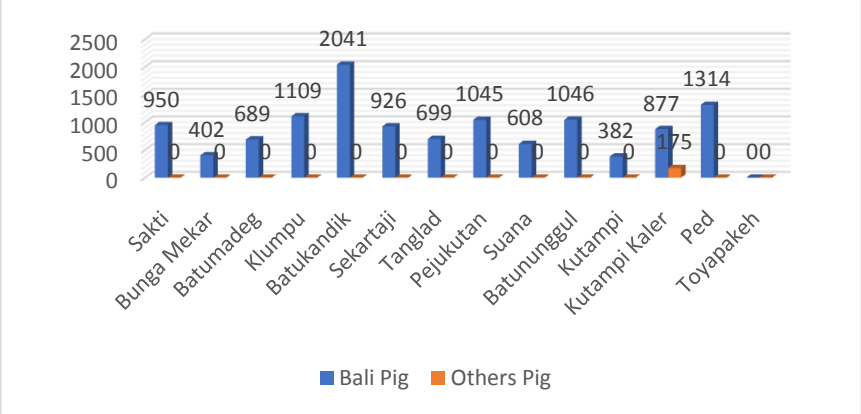

Figure 1. Pig Population in Nusa Penida Sub-district.

In 2016 there were 13,789 pig populations, consisting of 13,614 head Bali pigs, and 175 others (Klungkung Regency BPS, 2017). Local pigs are farmed by communities, almost in all villages in Nusa Penida District, except Ped Village (Figure 1).

Based on LQ analysis, Nusa Penida Sub-district is the base area for bali pig breeding development in Klungkung Regency. Nusa Penida Sub-District has a LQ value 1,299. While the other three sub-districts have LQ values below one. Complete data is presented in Table 1.

Table 1.Pig Population and LQ Value at Klungkung Regency.

Sub-district	Others species of Pig (head)	Bali Pig (head)	Total (head)	LQ Value
Nusa Penida	10.394	13.614	24.008	1.299
Banjarangkan	576	0	576	0
Klungkung	2.414	64	2.478	0,03
Dawan	1.836	2.150	3.986	0,70
Total	15.220	15.828	31.048	

Characteristic of Bali Pig Breeding Farmers

Bali pig breeding are cultivated as a side job by housewives, with the main job are coconut oil processing. Bali pig farms are carried out traditionally, without applying technology and maintenance management. The sows are tied with rope, and piglets are left freely without using a cage (Figure 2).

Figure 2. Bali Pig Breeding System in Nusa Penida Sub-district.

The scales of Bali pig breeding farm in Nusa Penida Sub-district are 2 sows/farmer, with average of 10 piglets. Adult pigs weigh 90 kg were calculated as 0.2 AU (Animal Unit), piglets <15 kg were calculated as 0.02 AU (Ensminger, 1961). Average of pig rising for each farmer is 0.6 AU. Averages of pig birth from each sow are 15 piglets, with average mortality of 10.35%. The frequency of giving birth to a sow is 12 times before being culled, with maternal mortality of 5.12%. Piglets are sold at average age of 2.5 months with average price of Rp. 400,000/head.

Potential of Local Feed for Bali Pig Breeding Development

Based on this study, there are several types of local feed ingredients that are used as bali pig's feed in Nusa Penida, including: coconut oil industrial waste, agricultural waste, and taro tree (tubers, stems, and leaves) as shown in Table 2.

Table 2. Bali Pig's Local Feed in Nusa Penida Sub-district.

Type of feed	Usage (%)
Taro tree	98
Banana waste	85
Cassava waste	70
Coconut oil cake	100
Liquid waste of coconut oil processing	100
Other agricultural waste	75

Feed composition of Bali pig in Nusa Penida Sub-district are: 23.53% coconut oil cake, 29.41% forage (i.e: taro tree, banana waste, cassava waste, and other agricultural waste), 35.29% liquid waste of coconut oil processing, and 11.76% pollard. Complete data is presented in Table 3.

Table 3. Amount of Bali Pig Feeding per-day/AU.

Feed	Amount	Percentage (%)
Coconut oil cake (Kg/day/AU)	4	23,53
Forage (Kg/day/AU)	5	29,41
Liquid waste of coconut oil processing (liter/day/AU)	6	35,29
Pollard (Kg/day/AU)	2	11,76

Pig farmers in Nusa Penida planted taro trees intentionally in the shade of plantation crops (coconut and banana) which are specifically intended as pig feed. Cassava waste which is used as pig feed is the leaves and tubers, while the main product is used as food for community needs in Nusa Penida. Coconut trees are commodities that are often found in Nusa Penida. There are 1,418 ha coconut plantationin 2016 with a total production of 262,960 coconuts. Coconut in Nusa Penida is used as coconut oil, and the waste are used as pig's feed. Data of coconut production, coconut oil production and waste production are presented in Table 4.

Table 4.Coconut, Coconut oil, and Coconut Oil Waste Production at Nusa Penida.

Village	Plantation Area (Ha)	Coconut Production (coconut/year)	Coconut Oil Production (Liter/year)	Coconut Oil Cake Production (Kg/year)	Coconut Oil Cake Needed (Kg/year)
Sakti	150	29.624	5.924,80	39.992,40	20.112
BungaMekar	78	14.024	2.804,80	18.932,40	8.510
Batumadeg	43	7.992	1.598,40	10.789,20	14.586
Klumpu	69	11.976	2.395,20	16.167,60	23.478
Batukandik	68	11.104	2.220,80	14.990,40	43.208
Sekartaji	87	16.744	3.348,80	22.604,40	19.603
Tanglad	87	15.952	3.190,40	21.535,20	14.798
Pejukutan	72	13.104	2.620,80	17.690,40	22.123
Suana	110	21.776	4.355,20	29.397,60	12.871
Batununggul	78	14.448	2.889,60	19.504,80	22.144
Kutampi	82	15.144	3.028,80	20.444,40	8.087
KutampiKaler	163	30.040	6.008,00	40.554,00	18.566
Ped	239	44.048	8.809,60	59.464,80	27.817
Toyapakeh	-	-	-	-	-
Lembongan	26	4.824	964,80	6.512,40	26.886
JungutBatu	66	12.160	2.432,00	16.416,00	5.420
TOTAL	1,418	262.960	52.592,00	354.996,00	288.208,00

The potential of coconut cake waste in Nusa Penida Sub-district are 354,996 kg/year, while coconut oil cake needed in 2017 are 288.208 kg. Based on the results of the research conducted, Nusa Penida Sub-district has an LQ value of 1,299 which indicates that the sub-district is potential for Bali pig breeding farm development. The availability of local feed originating from coconut oil waste and agricultural waste has been able to fulfill Bali pig's feed needs. It is assumed, if all the coconut produced in the Nusa Penida District is processed, the availability of animal feed will exceed the current feed requirements.

CONCLUSIONS

The conclusions of this study are: 1) Nusa Penida Sub-district are potential for Bali pig breeding farm development, with LQ value 1,299; 2) The availability of local feed originating from coconut oil waste and agricultural waste has been able to fulfill Bali pig's feed needs; and 3) Availability of local feed originating from coconut oil processing waste are potential to improved.

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