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Characterization Production Systems and Productivity Indices of Local Pigs of East Timor

Graciano Soares Gomes and Carlito de Araújo Mali Code

Department of Animal Science, Faculty of Agriculture, National University Timor Lorosa'e, P.O. Box 10000, Dili, East Timor

Abstract: The objective of this study was to evaluate the production system and productivity indices of local swine raised in subsistence production system in East Timor. About 1,096 respondents were interviewed in fitting villages in eight municipalities. In each village, 10% of breeders were interviewed as respondents, using simple random method and the interviews based on established questionnaires. It was observed that about 80%-90% of total respondents still used subsistence production system. The result of descriptive statistical analysis showed that the average of piglets per litter was 4-6 and weight of piglets at birth was 0.97 ± 0.22 kg. The age of weaning of piglets and the weaning weight was 3.94 ± 0.72 months and 5.56 ± 0.88 kg, respectively. The age of the first breeding gilts was 8-10 months; calving interval was 6-12 months. Productive period of females was 3-12 years, and the number of mortality rate of piglets was 0.17% to 1% per production period. Thus it was concluded that the subsistence production system could affect the productivity level of local pigs.

Key words: Production, subsistence systems, productivity indices, local pigs.

1. Introduction

For decades, pig's production system has been regarded as a marginal or subsistence activity in Timor-Leste and is normally low-productivity and carried out by small farms in rural areas across the territory. In addition, it is an excellent instrument for internalizing development, making small property viable and securing labor in the field. The most used pig breeding system is subsistence breeding, it is a form of extractive culture, with no concern for animal productivity and there is no technical control in its breeding activity [1]. The animals of different stages of production remain together and dispute among themselves the same food offered by the producers. The system characterizes primitive creations, without the use of appropriate technologies and, therefore, presents low levels of productivity. This system is used by farmers in rural areas who have never received any technical guidance on animal husbandry and only as an activity of secondary family importance or hobby. In this way, the breeding is intended for the supply of meat and fat for subsistence and the surplus is traded regionally, that is, the animals are only raised to meet the basic needs of the family to fulfill social obligations, to be sold in case of need to supply the family economy, and to be consumed on special occasions [2].

Based on the result of the National Statistical Census (NSC) in 2010, the country has a herd of 330,435 pigs distributed in 13 municipalities with an average density of 2-4 pigs per breeding establishment. However, the result of the NSC in 2015 [3] showed that pig production increased by about 26.85%, that is, with a total herd of 419,169 animals over a period of five years, with the national average density 2-6 animals per establishment. On the other hand, the breeders in the eight municipalities still live with a traditional swine culture consisting of local breeds with low performance production.

On the one hand, traditional production systems make it possible to respond adequately to production needs in order to take advantage of local resources and

Corresponding author: Graciano Soares Gomes, Ph.D., professor, research fields: swine production systems, monogastric nutrition and environmental impact.

native breeds. For this activity to be viable and profitable for producers, it is necessary to introduce modern or advanced production systems in order to improve animal production [1]. The use of technologies may be the best strategy to make and keep producers competitive, thus preventing them from abandoning the activity and subsequently ownership. However, the technology has to be transmitted in a rational, organized way to the producers, preserving the native breeds, identifying the causes of the animals' low performance and increasing their productivity [4]. Therefore, the existence of productivity targets for the herd is an essential element for monitoring the performance of the system and for diagnosing the problem of animal production. This work aimed to evaluate the productivity indexes and characterization of local pig production systems in the research area.

2. Materials and Methods

The study was carried out in eight municipalities in East Timor. Two municipalities located in southern part of the country. Three municipalities located in the southwest and three municipalities located in west of the country. Each municipality chose 10% of the total registered producers according to NSC in 2015, using the simple random sampling method to select the respondents. Thus, about 1,096 producers as respondents have been interviewed in this study.

The variables observed and interviewed in this study were the type of production systems, pig's productivity indices such as number of piglets (litter size), number of piglets weaned by farrowing, mortality rate of piglets, weight of piglets at birth (g), weight of piglets at weaning (kg), age of piglets at weaning (month), productivity period of sows (year), number of piglets weaned per sow per birth, calving interval (month), and the age of first production of sows (month/year).

Data were collected from May to November 2018. During the visits, a semi-structured questionnaire was applied to obtain the data. Observations and interventions were carried out by the same group with the same system to avoid misinterpretations. The data obtained or collected were subjected to statistical analysis (quantitative) according to Sampurna and Nindhia [5].

3. Results and Discussion

The statistical data analysis referring to the characterization of production systems and animal productivity indices was shown in Tables 1 and 2. It was found that 93.57% of the interviewees had practiced systems of extensive livelihood with some assistance. The animals are rearing free in the common areas and fed twice a day without worrying about the quantity and quality of food provided. In this breeding system, all animals from different stages of production competed together for the same food provided according to their agility and strength. On the other hand, the result of statistical analysis revealed that the local pigs bred in extensive production system without concern for productivity and technical control have low levels of productivity (Tables 1 and 2). In addition, breeders despite their breeding and socioeconomic importance, little is known about the characterization of production systems with applied technologies to improve animal productivity.

The data presented in Table 1 showed that the average of piglets per sow is 5.76 ± 1.61. The average weight at birth is 0.97 ± 0.22 kg. According to Filha *et al.* [2], the weight of local piglets varies from 0.70 kg to 1.30 kg or more, according to their breed. It is also possible to achieve five to six piglets per sow. In addition, it was observed that the weaning age of the piglets varied between two months and six months, with weaning weight from 3 kg to 15 kg. The results obtained in this study were considered as ideal according to Gomes *et al.* [6] that the productivity of the extensive subsistence system presents a number of piglets per sow per year from

Table 1 Local pigs productivity indices.

Indices	Unity	Average	Minimum	Maximum	Mode
Number of piglets/sows/birth	piglets	5.76 ± 1.61	1	10	5
Birth weight of piglets	kg	0.97 ± 0.22	0.60	1.20	1
Weight weaning of piglets	kg	5.56 ± 0.88	4	10	6
Number of piglets/sows	piglets	5.84 ± 3.31	2	10	5
Interval calving	month	6.50 ± 0.70	6	12	8
Number of piglets weaning/year	piglets	6.85 ± 3.31	2	20	5
Weaning age of piglets	month	3.94 ± 0.72	3	6	4
Age of the first delivery	month	11.99 ± 1.66	8	24	12
Productive period of sows	year	6.95 ± 1.71	3	13	8
Piglets mortality rate	piglets	1.33 ± 1.17	0	5	1

Table 2 Pig breeding system.

Systems	Total respondent	Percentage (%)
(1) Extensive without assistance	-	-
(2) Extensive with assistance	385	93.75
(3) Semi-intensive	-	-
(4) Conventional intensive	5	2.84
(5) Tie by rope	28	1.14
(6) Put in traditional corral	4	2.27
(7) Outdoor production systems	-	-
(8) Alternative feeding production	-	-

five to six piglets and the number of piglets weaned from three to five and the frequencies of births per sow per year less than one. The litter size at weaning is influenced by the number of piglets born alive, the age of them at birth and/or calving order and the time of birth [7].

For the age of the first sows rearing, it was found that in systems of extensive livelihood production, the animals entered into the production period with an average age of 11.99 ± 1.66 months. According to Sobestiansky *et al.* [8], the sow must start breeding when it reaches 10-12 months of age and is developing well. The sexual maturity of gilts occurs between 5.5 months and 6.5 months of age, with some variations depending on genetics, nutrition, management and the environment where they are housed [9]. To increase the productive indexes of breeding, it is necessary to use males and females of high genetic value in the breeding stock [1].

The average birth interval obtained in this study was sooner than six months and later than 12 months. This average is considered ideal by the literature that pigs raised in subsistence systems have the number of calves per year less than one [6].

4. Conclusions

The production system used in all villages was the extensive subsistence system with food management twice a day without considering the quantity and quality of the food provided. The values of the productivity indices of the animals obtained in this study are still considered low and late for the age of the gilts entering into production period. The result of observations showed that the producers, despite considering the importance of production and some parts of socioeconomic, however, there is still very little that they knowing about the characterization of production systems with applied technologies to improve the productivity of animals, especially

management of production, reproduction, animal health and animal welfare.

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