AJARCDE
ASIAN JOURNAL OF APPLIED RESEARCH FOR COMMUNITY DEVELOPMENT AND EMPOWERMENT

Journal home page: http://ajarcde-safe-network.org ISSN 2581-0405

Application of Fermented Feed Technology and Semi-Intensive Pig Farming System in the Women's Farmer Group "Suka Nadi" Pejarakan Village, Gerokgak District, Buleleng Regency

Yan Tonga[1], I Gede Sutapa[1], I Ketut Agung Sudewa[2]

[1]*Animal Husbandry Study Program, Faculty of Agriculture, Warmadewa University. Indonesia*
[2] *Agrotechnology Study Program, Faculty of Agriculture, Warmadewa University.* Indonesia

ARTICLE INFO

Article History:
Received: 29 July 2022
Final Revision: 02 January 2023
Accepted: 03 January 2023
Online Publication: 04 January 2023

KEYWORDS

balinese pig, fermentation, cage system, productivity, community service

CORRESPONDING AUTHOR

*E-mail: *tongayan64@gmail.com*

A B S T R A C T

The Balinese pig is an important livestock commodity for meat production, possessing considerable potential for development owing to its advantageous characteristics and adaptability. Nonetheless, its number on the island of Bali has been diminishing, presently predominantly located in restricted regions such as Buleleng, Karangasem, and Klungkung Regencies. From 2017 to 2019, the Balinese pig population in Bali Province dropped by 27.51%, with a comparable reduction of 26.09% in Buleleng Regency and nearly 50% in Pejarakan Village, Gerokgak District, Buleleng Regency. The principal reasons leading to this reduction encompass insufficient feed management and conventional, vast housing arrangements. Notwithstanding these obstacles, the Suka Nadi Women Farmers Group (KWT) in Pejarakan Village—145 km from the province capital and including 28 members—perseveres in small-scale, household-based Balinese pig farming. Nonetheless, the method encounters a significant death rate of 25%, chiefly because to suboptimal nutrition and insufficient feeding systems, resulting in piglets being trampled by their mothers and afflicted by malnutrition-related ailments. The farmers possess inadequate knowledge about techniques to enhance Balinese pig productivity, especially regarding feed supplies and management. Furthermore, their comprehension of optimal food crops like corn, bananas, and peanuts as sustainable resources for animal feed is constrained. This program seeks to augment farmers' expertise and competencies in enhancing Balinese pig productivity via improved feed management and the implementation of fermented feed technology. Furthermore, it aims to enhance the yield of food crops for animal feed applications. The implementation methods comprise surveys, interviews, discussions, theoretical and practical training, along with ongoing monitoring and assessment. Consequently, farmers attain a comprehensive understanding of efficient pig farming methodologies, especially in feed management, and develop the expertise to manufacture high-quality, economical fermented feed. Additionally, they establish small-scale facilities for the manufacturing of fermented feed at the home level, promoting more efficient and sustainable livestock management.

1. INTRODUCTION

1.1. Research Background

Balinese pig is one of the meat-producing livestock commodities that has great potential to be developed because it has beneficial properties and capabilities. However, its existence on the island of Bali has begun to decline and is only found in certain areas such as in Buleleng, Karangasem, and Klungkung Regencies. The Balinese pig population in Bali Province during the 3 years from 2017-2019 decreased by 27.51%, where in 2017 there were 215,000 heads, in 2018 there were 207,000 heads, and in 2019 there were 155,856 heads [1]. The same is

true in Buleleng Regency, which has the largest population of Balinese pigs, amounting to 86,519 heads (55.51%) of the total Balinese pig population [1]. This population has decreased by 26.09% compared to the population in 2017 (117,058 heads), while in 2018 it was recorded at 112,957 heads [2]. The decline in the Balinese pig population also occurred in one of the villages in Buleleng Regency, namely in Pejarakan Village, by approximately 50%, where in 2017 there were 5,506 heads, while in 2019 it decreased to 2,808 heads [3].

Pejarakan Village, Gerokgak District, Buleleng Regency, is one of the villages that serve as a center for Balinese pig farming. The orbital distance to the provincial capital is 145 km, to the district capital is 63 km, and to the sub-district capital is 26 km. The main potentials developed as a support for family income by the people of Pejarakan Village are in the livestock sector (Balinese pigs and Balinese cattle) and the agricultural sector (food crops such as corn, peanuts, and bananas) [3].

Currently, the Suka Nadi Women Farmers Group (KWT) has 28 members, all of whom rely on farming and livestock for their livelihood. However, the productivity of corn and peanuts is still not optimal, only reaching 5.5 tons/ha and 2.4 tons/ha, respectively. This is due to a conventional cultivation system where the soil is not cultivated, seeds are planted directly, and fertilization is carried out only once with doses that do not meet the standards of nutrient needs for these plants. On the livestock side, Balinese pig farming is carried out on a small/household scale. Each member owns 2-10 pigs, and the group perceives pig farming as a crucial part of their household income. However, the mortality rate of Balinese piglets before weaning is above 25%, categorized as very high, primarily due to poor feeding practices and inadequate housing systems.

The cage system implemented by partner members is extensive, meaning that the mother/male pig is tied at the base of a tree trunk without a roof, and newborn piglets are left to roam freely until weaning. Consequently, piglets are often crushed by their mothers, leading to a high mortality rate. This finding is supported by Tonga et al. [4], who reported a piglet mortality rate of 32.22% due to extensive housing systems in Gerokgak District. Other studies also reported high mortality rates: Kaka et al. [5] recorded a rate of 17.03%, while I et al. [6] recorded 19.69%, and Usman et al. [7] reported rates reaching 40-60% due to traditional housing systems and inadequate feeding.

Based on these conditions, a community partnership program (PKM) was designed to increase the productivity of food crops as animal feed to support livestock businesses. This involves transitioning to semi-intensive housing systems and improving animal feed quality through fermentation technology, thereby reducing labor and costs while improving feed efficiency.

1.2. Research Objective

The objective of this study is to enhance the sustainability and productivity of Balinese pig farming by improving feed efficiency and adopting semi-intensive housing systems. Specifically, the study aims to:

1. Reduce piglet mortality rates by implementing better housing systems.
2. Improve the nutritional quality of pig feed through fermentation technology.
3. Increase the productivity of corn as a sustainable feed source.
4. Strengthen the economic resilience of smallholder farmers in Pejarakan Village through integrated livestock and agricultural practices.

2. MATERIALS AND METHODS

The Community Service (PKM) activities were implemented through surveys, interviews, discussions, counseling, training, practical demonstrations, and the establishment of pilot projects. The following steps were carried out:

1. Field surveys were executed to identify the optimal partner locations for the implementation of the PKM program. The surveys evaluated current livestock and agricultural conditions, infrastructure, and farmer preparedness.
2. Interviews and discussions were conducted with farmers and local stakeholders to identify specific issues, evaluate their needs, and cooperatively devise solutions for enhancing pig farming and crop development.
3. Counseling sessions were conducted to equip farmers with ideas for enhancing Balinese pig yield. The sessions addressed optimal practices in animal husbandry, encompassing nutrition, disease prevention, and housing management.
4. Training on the implementation of fermented feed technology was done with Bioster technology [8]. This method enables feed fermentation within 3-5 days, maintaining usability for up to 6 months, thereby offering a cost-effective and sustainable alternative for feeding Balinese pigs.
5. Training to enhance maize output was conducted via Soil Loose Fitness Technology [9]. This technique improves soil aeration and nutrient uptake, consequently augmenting crop productivity and guaranteeing a consistent supply of feed for pigs.

Fig. 1. Feed Manufacturing Materials and Processes in Partner Groups

6. Tools and equipment were provided to facilitate feed fermentation and semi-intensive pig housing. These encompassed fermentation tanks, feed processing apparatus, and supplies for the construction of enhanced pig enclosures.
7. The building of a Fermented Feed Processing Site and semi-intensive pig housing was executed to serve as a prototype for local farmers. This facility facilitated practical instruction and demonstration of enhanced pig husbandry methodologies.

Monitoring, evaluation, periodic support, and reporting were conducted to evaluate the effects of the interventions. Consistent inspections and evaluations facilitated the successful adoption of

https://doi.org/ 10.29165/ajarcde.v7i1.216

new approaches by farmers, with requisite modifications implemented based on real-time observations and comments.

Fig. 2. Extensive Housing System in Partner Groups

3. RESULTS AND DISCUSSION

This PKM activity began with socialization of PKM activities, counseling on "Local Balinese Livestock Cultivation", "Fermented Feed for Local Pigs", and "Increasing Corn Production as a Staple Food Ingredient for Livestock" as well as Training on Making Fermented Feed for Local Pigs with Booster Technology and Corn Cultivation with Loose Soil Fit Technology (BGT).

3.1. Socialization Activities

Socialization about the activities of the Community Partnership Program (PKM) and counseling on "Local Pig Farming, "Fermented Feed for Local Pigs", and "Increasing Corn Production as a Staple Animal Feed" went following the plan and all the partner members were present and very enthusiastic about participating in the activity. This activity was also attended by the Village Head and Chairman of the Pejarakan Village Gapoktan, Gerokgak District, Buleleng Regency as seen in Figure 3.

Fig. 3. Socialization and Counseling Activities and Participants

3.2. Training on Fermented Feed Making with Booster Technology

The training in the form of the practice of making fermented feed with Booster technology uses 60% banana stem material, forage in the form of 30% moringa leaves/cassava/lamtoro, rice bran and 10% corn bran with the addition of Booster + Molasses + Trypi + Premit 1%. The feed ingredients are processed and then mixed with rice bran and corn and additional supplements. Next, it is placed in a container and fermented for 3-5 days and can last up to 6 months. Training activities can be seen in Figure 4

Fig. 4. Delivery of Tools and Materials as well as Training in Making Fermented Feed

3.3. Training on Corn Cultivation as Animal Feed with BGT Technology

This training is in the form of corn planting practices using superior seeds so that production is high and applying environmentally friendly Soil Fertilizer (BGT) technology using Agrodyke organic fertilizer, BioMi liquid organic fertilizer and Vegetable Pesticides and reducing the use of chemical fertilizers by 50-70%. Training activities as seen in Figure 5.

Fig. 5. Training on Superior Corn Cultivation, Growth and Harvest

3.4. Output of PKM Activities

1. Partners understand how to cultivate local pigs that are good and profitable and will apply it.
2. Partners understand and are able to make fermented feed with the results as seen in Figure 6 and are gluttonous eaten by local pigs.

Fig. 6. Fermentation Results for 5 Days and Application to Livestock

3. Partners understand and are able to apply superior corn cultivation by applying BGT technology and producing corn with a cob of 17.4 tons/ha with a corn yield of 81.8% or equivalent to 14.4 tons/ha. Previously, the corn yield was only 5-7 tons/ha. The results of the activity as seen in Figure 5.

Fig. 7. Corn Production

4. This activity has been published in online media: Media Indonesia, RedaksiBali.com, Suara Dewata.com, Berita Bali.com, Update Bali.com, Kabari Bali and will be published in the Community Service Journal of Warmadewa University and registered with the Ministry of Law and Human Rights of the Republic of Indonesia.

4 CONCLUSION AND SUGGESTION

4.1. Conclusion

PKM activities run according to the agreed stages and are very well received by partners. Partners understand and are able to apply fermented feed technology which is felt to be very effective and efficient (feed does not need to be cooked) and partners understand and are able to implement superior corn cultivation that is environmentally friendly with a yield of 17.4 tons/ha of corn with cobs (previously only 5-7 tons/ha) and a corn yield of 81.8% (14.4 tons/ha).

4.2. Suggestion

This PKM activity is expected to be sustainable, so periodic assistance is needed and the PKM Team suggested that this activity can be continued through the Food Security program of Pejarakan Village, Gerokgak Buleleng District.

REFERENCE

[1] Bali Provincial Agriculture Office, "Bali Livestock Data," 2019.

[2] Buleleng Regency Agriculture and Livestock Office, "Buleleng Livestock Data," 2019.

[3] Pejarakan Village, "Profile of Pejarakan Village, Gerokgak District, Buleleng," 2019.

[4] Y. Tonga, I.G.D. Sutapa, and N.M. Yudiastari, "Identification of Qualitative and Quantitative Traits of Balinese Pigs in Gerokgak District, Buleleng Regency," Research Report, Warmadewa University, 2021.

[5] A. Kaka, R.R. Dapawole, and A.U.H. Pari, "Population Structure and Reproductive Performance of Pigs in East Sumba Regency," J. Indones. Anim. Husb. Sci., vol. 15, no. 2, 2020.

[6] A.S. I, T. Saili, and Amirudin, "Distribution, Population Structure, and Reproductive Performance of Local Pigs in Tinanggea District, South Konawi Regency," Agriplus, vol. 23, no. 3, pp. 118-192, 2013.

[7] B.M.W. Usman, S.Tirajoh, and Bustami, "Group Profile and Reproductive Performance of Local Pigs in Doligame Farmer Group, Tiom District, Papua," BPTP Papua, 2015.

[8] I.G.D. Sutapa et al., "PKM in Livestock Group in Jembrana Regency," 2017.

[9] I.G.D. Sutapa, "Efficiency of Urea Fertilizer with Organic Fertilizers on Corn Yield," J. Wise Environ., vol. 24, no. 2, pp. 37-53, 2015.

https://doi.org/ 10.29165/ajarcde.v7i1.216