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Training on the Application of Silage Technology for Vegetable Waste as Feed for Ducks in Kayu Manis Village

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Abstract

Purpose: This study addresses the challenge of low community knowledge in Kayu Manis village, aiming to boost interest and skills in duck farming. The primary objective is to elevate community understanding by applying silage technology to convert vegetable waste into duck feed.

Method: Through training sessions involving socialization, practical demonstrations, and hands-on practice, participants learn to create vegetable waste silage as duck feed. Pre- and post-test evaluation reveals significant sequential improvements of 88.15%, 7.69%, and 89.23% in knowledge, interest, and skills.

Practical Applications: The outcomes offer practical benefits for the community and potential scalability for similar agricultural sectors. Silage technology proves valuable in enhancing sustainable farming practices.

Conclusion: In conclusion, the community-based intervention focusing on making vegetable waste silage effectively achieves its goals of enhancing participants' knowledge, interest, and skills in duck farming. The sequential increases of 88.15%, 7.69%, and 89.23% underscore the training program's success. The practical applications extend beyond Kayu Manis village, demonstrating the broader relevance and impact of implementing silage technology in agricultural practices. This research contributes significantly to addressing the initial problem outlined in the introduction, emphasizing the importance of sustainable and innovative approaches in community-based agrarian interventions.

Introduction

The Selupu Rejang Subdistrict is an area where the majority of the population works as horticultural farmers (83.33%), with a total vegetable production in the subdistrict of 367,915 quintals (Badan Pusat Statistik, 2018). On average, horticultural plants generate waste amounting to 36.04% (Suningsih et al., 2022).

One of the villages in the Selupu Rejang Subdistrict is Kayu Manis village. Currently, duck farming by members of the agricultural group in Kayu Manis village is not yielding optimal results in terms of both egg and meat production. Observations indicate several factors influencing duck production, including duck farming being a side job for farmers, lack of intensive care for ducks, obtaining ducklings without a selection process, and providing feed that does not meet duck nutrition standards (only rice bran is given). Additionally, the duck population in the farming group tends to decrease due to difficulties in providing feed. According to (Badan Pusat Statistik, 2020), the duck population in the Rejang Lebong Regency was 24 thousand in 2019, while in the Kayu Manis village farming group, the duck population is only around 15-20 ducks. (Subagja et al., 2017) state that factors affecting semi-intensive laying duck production include energy and protein needs, the experience, and skills of the workforce in duck farming, and duck pen density.

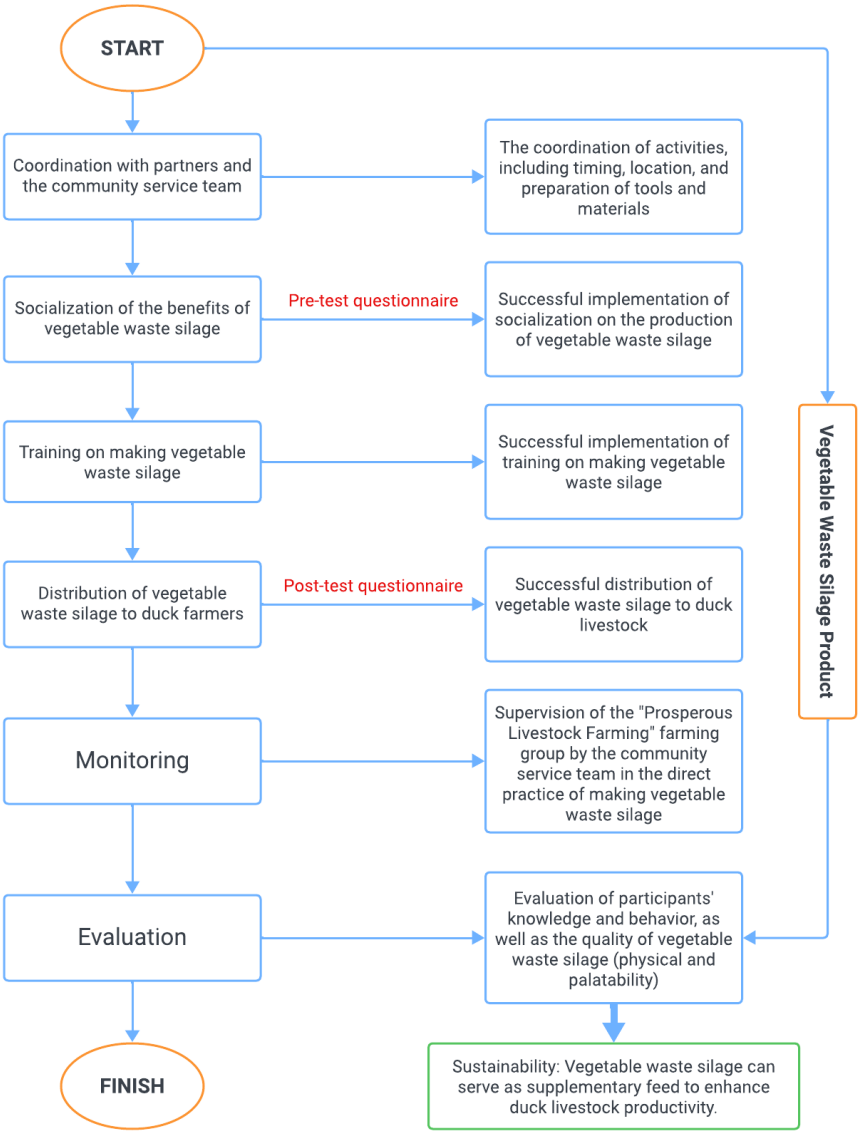
Utilizing vegetable waste is an effort that can be made to meet duck nutritional needs (Utami & Saelan, 2021). Additionally, vegetable waste is always available, making it suitable as livestock feed material. However, untreated vegetable waste may provide poor nutritional quality, requiring efforts to enrich the nutritional value of the waste (Azizi, 2019). Through vegetable waste silage technology, the nutritional quality can be improved, and when consumed by ducks, it can positively impact their growth and productivity. According to (Saelan & Nurdin, 2018), using vegetable waste in laying duck rations up to 15% can increase egg production, and feed consumption and conversion are more effective and efficient. (Herijanto et al., 2017) Feeding ducks with vegetable waste silage containing Lactobacillus casei up to 20% resulted in the best body weight for male ducks. (Setiyawan & Fitasari, 2018) Traditional market vegetable waste contains crude protein (CP) ranging from 12.64% to 23.50%, and crude fibre (CF) ranging from 20.76% to 29.18%. (Superianto et al., 2018) Reported that silaged cabbage waste with rice bran supplementation and fermentation for 7 days had dry matter (DM) at 82.76%, crude protein (CP) at 10.67%, crude fibre (CF) at 26.82%, and crude fat at 3.29%.

Based on the above description, the main factor and priority issue in the Kayu Manis village farming group is the lack of knowledge about processing vegetable waste into duck feed, leading to a decreased interest in duck farming among the community. Therefore, our community service team from the Rejang Lebong State Community Academy (AKREL) conducted a community service project titled "Training on the Making of Vegetable Waste Silage as Duck Feed in Kayu Manis Village, Selupu Rejang Subdistrict."

Method

The training activity for making vegetable waste silage was conducted on July 20, 2022, in Kayu Manis village, Selupu Rejang Subdistrict, Rejang Lebong Regency, Bengkulu. The target of this activity was the farming group in Kayu Manis village, consisting of approximately 15 people. The tools used included a scale, tarpaulin, PE plastic, covered buckets, machetes, basins, and plastic bags. The materials used included EM4 (Effective Microorganisms), rice bran, sugar, water, and vegetable waste.

Figure 1. Stages of community service activities.



Based on Figure 1, the stages of training for making vegetable waste silage consist of coordination, socialization, demonstration or practice, monitoring, and evaluation. Pre-tests and post-tests were conducted before and after the training to measure the improvement in participants' knowledge, interest, and skills related to vegetable waste silage. The data obtained were tabulated and then converted into percentages, projected as bar graphs.

Coordination was carried out with the head of the farming group to determine the time and place of implementation. Once the time and place were decided, the community service team prepared the tools and materials. On the day of the community service, socialization related to vegetable waste silage technology, the benefits of vegetable waste silage, the advantages of vegetable waste, and the method of making vegetable waste silage were conducted. After the socialization event, practical training on making vegetable waste silage followed. Silage is a product of fermentation technology; in this case, the fermentation process of vegetable waste takes place over 7 days. After 7 days, the vegetable waste silage is harvested and aired to reduce the ammonia gas produced during fermentation before being given to duck livestock.

The formula for making vegetable waste silage is EM4 0.16%, Water 15.81%, Sugar 0.24%, Rice Bran 4.74%, and Vegetable Waste 79.05%. The procedure for making vegetable

waste silage involves preparing the tools and materials, dissolving EM4, sugar, and water according to the specified measurements, chopping vegetable waste evenly to a size of 3-5 cm, then airing or draining until the moisture content of the vegetable waste is 60%. Mix the chopped vegetable waste evenly and spread it on a flat surface with a base. Slowly and homogeneously pour the EM4 solution over the spread vegetable waste. Remix the vegetable waste until the EM4 solution and vegetable waste are evenly blended. Place the vegetable waste in a plastic bag the size of a fermentation bucket and compact it to eliminate gaps and air pockets (be careful not to tear the plastic). Tie the end with wire or rope, and place it in a covered bucket, ensuring it is tightly closed and prevents air from entering. Put it in a shaded place and ferment for 7 days. After 7 days, the vegetable waste fermentation is opened, and organoleptic tests are observed and performed. Spread and air the vegetable waste fermentation for about 30 minutes. The vegetable waste fermentation can then be given to duck livestock.

Result

The results of community service activities can be observed through the initial targets and achievements after the activities are carried out, as shown in Table 1 below. The first activity involves the transfer of knowledge and technology. The knowledge transferred relates to information about vegetable waste silage. The fermentation technology of vegetable waste is transferred to participants, and the resulting product is referred to as silage. A speaker delivers the transfer of knowledge and technology regarding vegetable waste silage.

The second activity involves the practical aspect of making silage, guided by a technician. Participants follow the technician's instructions regarding the stages of making vegetable waste silage until completion.

Table 1. Achievement Targets of Community Service Activities

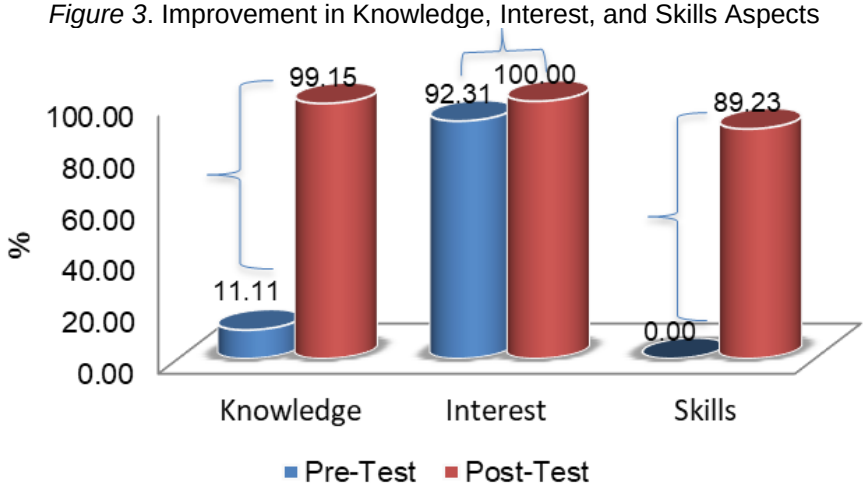
No	Type of Achievement	Initial Target	Achievement
1	Transfer of knowledge and technology on vegetable waste silage-making methods	Attained	Attained
2	Implementation of vegetable waste silage-making training	Attained	Attained
3	Increased knowledge, interest, and skills of participants in making silage	Attained	Attained
4	Production of vegetable waste silage products	Attained	Attained
5	Print Media "Curup Ekspress"	Attained	Attained
6	Submission to the National Journal of Community Service	Attained	Attained

Figure 2. Community service activities published in Curup Ekspress

The results of pre-tests and post-tests of the training on vegetable waste silage-making

for the farming group in Kayu Manis village, regarding knowledge, interest, and skills aspects, can be seen in Figure 3.

Figure 3. Improvement in Knowledge, Interest, and Skills Aspects



Discussion

The community service activity began with an opening session, followed by the main events, socialization and training on making vegetable waste silage. Approximately 15 participants attended the event. The participants enthusiastically engaged in socialization and hands-on training for making vegetable waste silage.

The improvement in knowledge, interest, and skills in making vegetable waste silage can be observed from the results of pre-tests and post-tests of the participants. The participants' interest increased from the beginning to the end of the training, with a percentage ranging from 92.31% to 100%. This exciting aspect includes curiosity about various types of vegetable waste, vegetable waste silage, vegetable waste processing technology, how to make vegetable waste silage, the time required, and curiosity about the benefits of vegetable waste silage. Furthermore, the knowledge aspect of the participants also increased from 11.11% to 95.15%. The skill aspect also showed a significant increase, with participants progressing from having no skill in making vegetable waste silage (0%) to having the skill or ability to make vegetable waste silage (89.23%).

The silage product was observed organoleptically after fermenting the vegetable waste for 7 days. The observation showed that the vegetable waste silage produced had a brown colour, a characteristic silage aroma, acidic pH, and a soft texture. Additionally, no mould or foreign objects were found.

(Adriyanto et al., 2019) Stated that vegetables and fruits can easily undergo browning if they are peeled or cut. Browning is forming yellow pigments that will soon turn dark brown (Funan et al., 2022). According to (Ardigurnita et al., 2022), a good silage aroma is slightly acidic and free from sweet, ammonia, and H2S odours. A pH of 4.3-4.5 for silage is quite good, and a pH of 3.8-4.2 is ideal.

Figure 4. Vegetable Waste Silage

Conclusion

In conclusion, the community service project undertaken by the Rejang Lebong State Community Academy (AKREL) in Kayu Manis village, Selupu Rejang Subdistrict, addressed a critical issue in the farming group related to the lack of knowledge about utilizing vegetable waste for duck feed. The subdistrict, primarily engaged in horticulture, generates a significant amount of waste, providing an opportunity to enhance duck farming practices by converting this waste into nutritious silage. The training program successfully increased participants' knowledge, interest, and skills in making vegetable waste silage, as evidenced by pre-test and post-test results, where interest levels reached a remarkable 92.31% to 100%, and knowledge and skills exhibited substantial improvements.

The application of vegetable waste silage technology demonstrated positive outcomes, producing silage with desirable characteristics such as colour, aroma, pH level, and texture. This approach addresses the environmental concern of waste management and offers a sustainable solution for enhancing duck nutrition. The success of this community service initiative signifies the potential for broader adoption of vegetable waste utilization in livestock feed practices, promoting sustainable agriculture and benefiting local communities.

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Reference

Adriyanto, A., Budiman, B., & Amalinda, F. (2019). *Uji Perbandingan Kemasan Berpori Dan Tidak Berpori Pada Bahan Pangan Buah Dan Sayur*. https://www.semanticscholar.org/paper/Uji-Perbandingan-Kemasan-Berpori-Dan-Tidak-Berpori-Adriyanto-Budiman/e8d9b3e78f2c5017b3f7b08c89294e9fdbb5368d

Ardigurnita, F., Frasiska, N., & Rahayu, N. (2022). Efek Lama Proses Amofer terhadap Protein Kasar dan Lignin Kulit Buah Kakao. *Bulletin of Applied Animal Research*, *4*(1), 29–34. https://doi.org/10.36423/baar.v4i1.939

Azizi, M. R. (2019, March 19). *Evaluasi Kualitas Nutrisi Silase Batang Pisang (Musa Paradisiaca) Dengan Berbagai Akselerator Yang Diberi Inokulan Em4 Sebagai Pakan Ternak Ruminansia*. https://www.semanticscholar.org/paper/Evaluasi-Kualitas-Nutrisi-Silase-Batang-Pisang-Yang-Azizi/19b31ed11bb61c8e0d56cccba6ae56aa9c684258

Badan Pusat Statistik. (2018). *Badan Pusat Statistik Kabupaten Rejang Lebong*. https://rejanglebongkab.bps.go.id/indicator/55/74/1/produksi-sayuran.html

Badan Pusat Statistik. (2020). *Badan Pusat Statistik Provinsi Bengkulu*.

https://bengkulu.bps.go.id/statictable/2021/07/07/652/populasi-unggas-menurut-kabupaten-kota-dan-jenis-unggas-di-provinsi-bengkulu-ribu-ekor-2019-dan-2020.html

Funan, M. A., Panca Nastiti, H., & Tany Temu, S. (2022). Protein Kasar, Serat Kasar dan Kalsium (Ca) Hijauan Padang Penggembalaan Alam di Desa Praipaha Kecamatan Ngaha Ori Angu Kabupaten Sumba Timur: The Content of Crude Protein,Crude Fiber and Calcium (Ca) Forage Native Grassland In Praipaha Village Ngaha Ori Angu District East Sumba Regency. *Jurnal Peternakan Lahan Kering*, *4*(2). https://doi.org/10.57089/jplk.v4i2.1089

Herijanto, S., Supranoto, & Tugiyanti, E. (2017). Performa Itik yang diberI Pakan Silase lImbah Sayuran Pasar (The Ducks Performance fed by Silage Vegetable Waste). *Jurnal Ilmu Dan Teknologi Peternakan*, *5*(2), Article 2. https://doi.org/10.20956/jitp.v5i2.3070

Saelan, E., & Nurdin, A. S. (2018). Pengaruh Penggunaan Limbah Sayuran dalam Ransum Terhadap Performa Produksi Itik Petelur. *Jurnal Ilmu Ternak Universitas Padjadjaran*, *18*(2), Article 2. https://doi.org/10.24198/jit.v18i2.19501

Setiyawan, A. I., & Fitasari, E. (2018). Pengaruh Perbedaan Tiga Jenis Daun Ketela Pohon Terhadap Konsumsi dan Konversi Pakan Ulat Sutera Samia Cynthia. *TERNAK TROPIKA Journal of Tropical Animal Production*, *19*(1), 32–37. https://doi.org/10.21776/ub.jtapro.2018.019.01.5

Subagja, H., Prasetyo, B., & Nurjanah, H. (2017). Faktor Produksi Usaha Ternak Itik Petelur Semi Intensif Di Kabupaten Jember. *Jurnal Ilmiah Inovasi*, *17*(2), Article 2. https://doi.org/10.25047/jii.v17i2.545

Suningsih, N., Nur'aini, N., Hakim, M., Ibrahim, U., Azis, A. R., & Sudarmanto, S. (2022). Potensi Limbah Pertanian Dan Agroindustri Sebagai Pakan Ternak Di Kecamatan Selupu Rejang Kabupaten Rejang Lebong. *Jurnal Peternakan (Jurnal of Animal Science)*, *6*(1), Article 1. https://doi.org/10.31604/jac.v6i1.6420

Superianto, S., Harahap, A. E., & Ali, A. (2018). Nilai Nutrisi Silase Limbah Sayur Kol dengan Penambahan Dedak Padi dan Lama Fermentasi yang Berbeda. *Jurnal Sain Peternakan Indonesia*, *13*(2), Article 2. https://doi.org/10.31186/jspi.id.13.2.172-181

Utami, O. S., & Saelan, E. (2021). *Abstract: The Mandiri Community Partnership Program (PKM) "Training on Vegetable Waste Treatment as Duck Feed in South Ternate District" will be conducted with the partner farmer groups of Buku*. https://www.semanticscholar.org/paper/Abstract%3A-The-Mandiri-Community-Partnership-Program-Utami-Saelan/9a563a3d44e232f7f3863064a2659541d63addff