

Application of the Herbal Mineral Block to Support Goat Farming Business Productivity in Salit Village, Karo Regency

Peni Patriani^{*1}, Hasnudi¹, Uswatun Hasanah¹, Kennie Cendekia Desnamrina¹

¹Animal Husbandry Study Program, Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia.

*Corresponding Author: penipatriani@usu.ac.id

ARTICLE INFO

Article history:

Received 22nd December 2022

Revised 15th May 2023

Accepted 30th May 2023

Available online

<https://talenta.usu.ac.id/jst/index>

E-ISSN: 2621-4830

P-ISSN: 2621-2560

How to cite:

P. Patriani, Hasnudi, U. Hasanah, K.C. Desnamrina "Application of the Herbal Mineral Block to Support Goat Farming Business Productivity in Salit Village, Karo Regency," Journal Saintech Transfer, vol. V6, no. 1. pp. 33-40 2023.

ABSTRACT

Harapan Maju is a farmer group in the goat farming business in Salit Village, Karo Regency, North Sumatra Province. The livestock business is carried out semi-intensively by utilizing agricultural waste as feed. The problems faced by the Harapan Maju Farmer Group are a decrease in goat productivity, low body weight, less optimal management of livestock feed, and environmental pollution conditions due to agricultural waste. The solution to the problem is to apply nutritional supplement technology (Herbal Mineral Block) to livestock and feed preparation from agricultural waste. The methods used in community service are extension, training and practice, and mentoring. The results of community service activities are 1) improved science and technology skills in increasing goat productivity through feed preparation; 2) improved skills of farmers in making nutritional supplements (Herbal Mineral Block); 3) reduced pollution from agricultural waste; 4) increased goat productivity through feed using agricultural waste; 5) increased income through the improvement of goat farming business management

Keyword: Herbs, Supplements, Productivity, Farmers, Feed

ABSTRAK

Kelompok Tani "Harapan Maju" merupakan gabungan kelompok tani dibidang usaha pertanian dan peternakan kambing di Desa Salit, Kabupaten Karo, Provinsi Sumatera Utara. Usaha peternakan dilaksanakan secara semi intensif dengan memanfaatkan limbah pertanian sebagai pakan. Permasalahan yang dihadapi oleh Kelompok Tani Harapan Maju diantaranya penurunan produktivitas, rendahnya bobot badan ternak, manajemen pakan kurang maksimal dan adanya kondisi pencemaran lingkungan karena limbah pertanian. Solusi permasalahan adalah dengan mengaplikasikan teknologi nutritional supplement (Herbal Mineral Block) pada ternak dan penyusunan pakan dari limbah pertanian. Metode yang digunakan dalam pengabdian kepada masyarakat adalah penyuluhan, praktik pelatihan, dan pendampingan. Hasil yang diperoleh dalam kegiatan pengabdian masyarakat ini adalah 1) Peningkatan ilmu pengetahuan dan teknologi dalam meningkatkan produktivitas ternak melalui penyusunan pakan; 2) Peningkatan keterampilan peternak dalam membuat suplemen nutrisi (Herbal Mineral Block); 3) Berkurangnya pencemaran dari pembakaran limbah pertanian; 4) Peningkatan produktivitas kambing melalui perbaikan pakan menggunakan limbah pertanian; 5) Peningkatan pendapatan melalui perbaikan manajemen usaha beternak goat.

Keyword: Herbal, Suplemen, Produktivitas, Peternak, Pakan



This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International.

<http://doi.org/10.32734/jst.v6i1.10518>

1. Introduction

Harapan Maju is a farmer group in the goat farming business in Salit Village, Karo Regency, North Sumatra. In 2020, Lalit Village yielded 142.37 tonnes of upland rice, 47.10 tonnes of maize, various vegetables and secondary crops, 187 goats, 105 pigs, and 1,177 poultry [1]. High yield of crops produces agricultural waste in the form of rice and corn straw. Agricultural waste is usually used as feed for goats and sheep with added grass. Abundant agricultural waste is usually burned by farmers, resulting in air pollution. Agricultural waste can be used for livestock feed. Utilization of agricultural waste as livestock feed is a good step in reducing the cost for a ratio reaching 50%-80% of the total production cost. However, the use of livestock feed related to agricultural waste needs attention, especially in terms of fibre digestibility and nutrients needed by goats. In addition to availability, factors that must be considered in livestock feed are nutritional content as limiting

factors such as low protein content, high crude fibre, and low digestibility. Therefore, a method is needed to improve quality in addition to adding nutritional supplements.

Harapan Maju Farmer Group is a farmer group in the goat farming business in Salit Village with Saul Sitepu as chairman. Based on early-stage interviews, there are several problems such as low livestock productivity, low nutrition and livestock feed, carcass weight does not meet consumer demand, and agricultural waste pollution in the form of straw which is often burned and unused. In addition, "Harapan Maju" also does not have reliable human resources so knowledge transfer is needed to overcome these problems. One solution to the problem is the application of nutritional supplements (Herbal Mineral Block) to increase goat productivity. According to [2] mineral block is a feed supplement containing vitamins and minerals to increase goat reproduction. According to [3] urea molasses, a multi-nutrient block is an easy and inexpensive way to fulfil goat nutrition because it can increase the digestibility of low-quality feeds thereby increasing livestock productivity, especially carcass weight, body condition score and reproduction. Urea molasses multi-nutrient block can be added with herbs such as temulawak to increase livestock appetite (Herbal Mineral Block). Temulawak (*Curcuma zanthorrhiza*) is a spice containing anti-inflammatory, antihepatotoxic, antibacterial and antifungal compounds [4]

Various agricultural wastes used in the "Harapan Maju" farmer group have not been chopped and withered, causing livestock not to absorb nutrients optimally in the feed. The feed in the form of concentrate and grass is manipulated in the rumen with nutritional supplements or Herbal Mineral Blocks [5]. The combination of protein sources can efficiently support the growth and development of microbes in the rumen. Commercial mineral block nutritional supplements can indeed be obtained at livestock production facility stores. However, it would be better if farmers knew and learned to make mineral blocks to reduce costs [4]. The addition of herbal ingredients can be performed in the manufacture of nutritional supplements known as Herbal Mineral Blocks. According to [6] apart from local feeds, the utilization of Herbal Mineral Blocks will be much cheaper than buying finished products. The goals of community service is: 1) to improve science and technology skills in increasing goat productivity through feed preparation; 2) to improve skills of farmers in making nutritional supplements (Herbal Mineral Block); 3) to reduce pollution from agricultural waste; 4) to increase goat productivity through feed using agricultural waste; 5) to increase income through the improvement of goat farming business management.

2. Methods

To achieve the goal, several concrete steps should be conducted with various problems. Before implementing community service activities, initial surveys and information from partners were carried out with in-depth interviews with the chairman and members of the "Harapan Maju" farmer group in Salit Village Karo Regency. The methods are as follows:

2.1. Survey

The initial survey was conducted on the "Harapan Maju" farmer group regarding problems to find potential resources as support for community service activities.

2.2. Problem identification

Problem identification in the "Harapan Maju" farmer group Salit Village was carried out by deliberation on the right solution. The application of technology is a solution so that farmers are free from backwardness and can use science and technology for mutual benefit appropriately.

2.3. Training and practice

Participatory practice and training were carried out by the "Harapan Maju" farmer group using groups as learning media while mentoring using adult learning methods.

2.4. Extension and education

Extension and education aim to improve skills and adoption of science and technology. Comprehensive community service activities related to human resources, raw materials, processes, and feed preparation were carried out through extension and training [7].

2.5. Manufacturing herbal mineral block

Ingredients of Mineral Block Herbal are: 1) Urea, ruminant livestock such as goats can utilize different protein sources from poultry or monogastric livestock. Non-protein nitrogen (NPN) such as urea is quite cheap as a source of N and protein. 2) Molasse has benefits if the basal feed material has not been able to meet the living needs of livestock. 3) Mineral sources such as bone meal, shellfish flour, dolomite, lime, and table salt. Premix minerals need to be added to the urea molasses block if the basal feed given is of very low quality. The use of table salt can also increase the palatability of goats. 4) Hardener materials such as cement or lime can be used as a binder and a source of calcium/Ca [8]. Cement or lime up to 15% can make urea molasses block hard and not harm livestock. 5) Fillers are used as a source of energy and protein. Fillers are added to increase the nutritional content of the Herbal Block Minerals while making the solids faster and more compact. According to [9] the filler often used for urea molasses block is rice bran. 6) Herbal ingredients are added such as temulawak to increase livestock appetite, prevent intestinal worms, anti-inflammatory, anti-fungal, and can maintain livestock health.

Herbal Mineral Block can be made by dissolving molasses with water using a 1:1 ratio and then heating to boiling. After boiling, add urea and salt until dissolved, then add filler to the dough. The dough is put into the mould and dried. Herbal Mineral Block should be hung so that the goat can lick, it is expected that the goat can consume 120 grams/day. Livestock supplements such as mineral blocks can be made in solid, compact, and hard forms but are soluble in water making it easier for livestock to lick them [10-11]. The use of Mineral Molasses Block as a feed supplement with sufficient protein, energy, and mineral content can be used for livestock. Urea molasses block for goats is useful to avoid vitamin and mineral deficiency as well as malnutrition due to the low nutritional value of feed and to increase livestock production.

3. Results and Discussion

At the initial stage, the community service team prepared samples of herbal mineral blocks and leaflets of goat feed preparation to be presented during training.



Figure 1. Herbal mineral block for goats.

Herbal Mineral Block can be made by dissolving molasses with water using a 1:1 ratio and then heating to boiling. After boiling, add urea and salt until dissolved, then add filler to the dough. The dough is put into the mould and dried. Herbal Mineral Block should be hung so that the goat can lick, it is expected that the goat can consume 120 grams/day. Livestock supplements such as mineral blocks can be made in solid, compact, and hard forms but are soluble in water making it easier for livestock to lick them [10-11]. The use of Mineral Molasses Block as a feed supplement with sufficient protein, energy, and mineral content can be used for livestock. Urea molasses block for goats is useful to avoid vitamin and mineral deficiency as well as malnutrition due to the low nutritional value of feed and to increase livestock production.

3.1. Improved skills in preparing goat feed

Livestock management in the "Harapan Maju" farmer group in Salit Village, especially feed preparation, needs improvement. Feeding of male and female goats must be adjusted according to age and phase because different nutrient intakes are needed. The feed preparation training was carried out with 15 participants from goat farmers. The goat feed preparation material was delivered by the community service team regarding the types and formulas of goat feed. Livestock feed management material showed that goat feed could be 70% forage and 30% concentrate.

Goats can be given forage 2-3 times a day in the form of grass, legumes, and leaves and 0.5 kg concentrate per day. According to [12] quality feed can support goat performance so that livestock productivity is more optimal. Goat and sheep feed in the form of forage consists of grass and legumes while additional feed is in the form of concentrate. The concentrate usually consists of 20% milled corn, 20% bran, 25% pollard, 19% coconut cake, 14% cassava, 1% salt, and 1% minerals mixed evenly [13]. The concentration needed by goats per day is about 3% of their body weight. For example, a goat with a body weight of 20 kg requires 600 grams of feed per day. If the ratio of forage and concentrate is 70:30, then concentrate is 180-200 grams while forage is 420-470 grams. Forage should be chopped 5 cm long using a chopper machine to improve digestibility. The community service team also provides equipment in the form of a chopper machine to make it easier for farmers to prepare the feed.



Figure 2. Feed preparation using chopped forage.

Based on the questionnaire given to farmers, 15 farmers stated that training can provide insight and improve skills in feed preparation. Data on the improvement of farmers' skills was assessed from the ability of farmers and the skills applied during community service activities. Data is taken based on questionnaires about the preparation of animal feed. Data on the improvement of farmers' skills in preparing feed is presented in Figure 1 below.

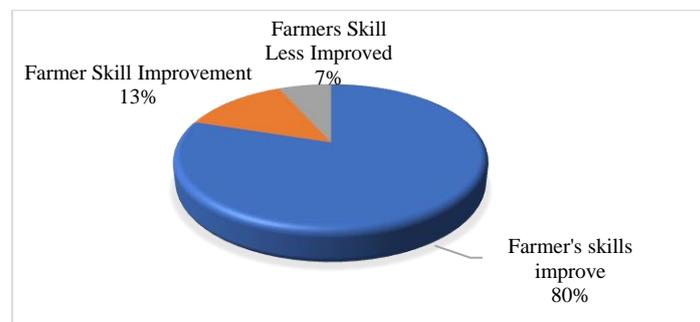


Figure 3. Diagram of Percentage of Skill Improvement in Preparing Goat Feed.

Based on the diagram, it is presented that out of 15 farmers, there was an increase in skills in the preparation of feed by 80 %, 13% of the skills were sufficiently improved and farmers who could not customize 7%.

The indicator of achievement is the ability of farmers to prepare livestock rations according to the guidelines in the training. This means that 93% of this service is successful in achieving the target while 7% of farmers have not been able to improve their skills due to age factors that are too old. The training went quite smoothly and farmers were actively involved in feed preparation training. The discussion session was related to the use of chopper machines and the correct timing of feeding. In the next stage, mentoring will be carried out to ensure that the training materials are applied to the goats.

3.2. Improved skills to formulate and make herbal mineral blocks

Training in the preparation of herbal mineral blocks can improve the knowledge of farmers. Based on the

questionnaire, manufacturing herbal mineral blocks is easy to learn and practice. Practice and theory were first guided by the community service team, then farmers followed all the herbal mineral block manufacturing processes. A total of 15 participants stated that this activity could improve their knowledge of livestock supplementation. The application of herbal mineral block to goats has been carried out and has produced positive responses for several months. The results of the questionnaire distributed to farmers showed that after being given a herbal mineral block, goats had an increased appetite, increased body weight, high disease resistance, and were more agile.



Figure 4. Practice making herbal mineral blocks for goat.

Data from the results of community service found that out of 15 farmers, 87% of farmers can formulate and make herbal urea molasses blocks. Farmers who are quite capable of formulating and making herbal urea molasses blocks are 6%. Farmers who have not been able to formulate and make herbal urea molasses blocks are 7%.

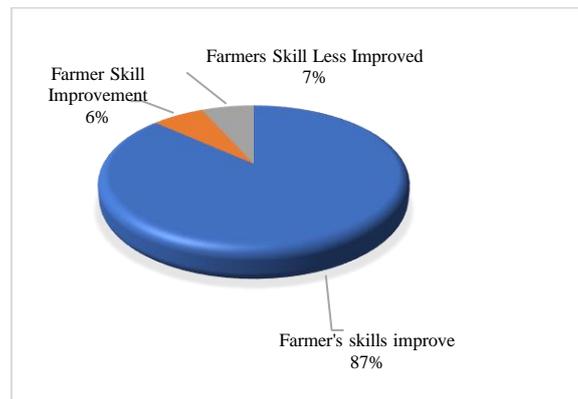


Figure 5. Diagram of improved skills to formulate and make herbal mineral blocks.

Based on the data above, the achievement of community service is 93%. The achievement of community service is very good because, from the results of observations during monitoring and evaluation, farmers can formulate raw materials and make herbal urea molasses blocks. Farmers who have not been able to formulate and make herbal mineral blocks due to age factors make it difficult to adopt knowledge and accept innovations. Technology and innovation applied to farmers can increase knowledge, ultimately leading to increased welfare in the future. Farmers in Salit Village feel the benefits of the herbal mineral block application. This is due to the diffusion of innovation during the mentoring process and training practices are relevant to the needs of the community. According to [14] the novelty aspect of a technology or innovation will be seen when it can provide new knowledge so that there is a belief that the technology needs to be adopted or applied. In the community service carried out, the process of adopting appropriate technology has been going well.

3.3. Reduced pollution from burning agricultural waste

Agricultural waste pollution can occur when burned in the fields. This can be a cause of air pollution during the harvest season because more agricultural waste is burned. The utilization of waste as livestock feed needs to be applied by making the right formulation. The remaining yield in the form of bean leaves, potato plants,

bean plants, corn, and others can be further processed into forage or preserved feed. Fresh forage feed can be chopped beforehand to increase digestibility, while preserved feed can be processed by fermentation. According to [15] stated that rice straw has great potential as a ruminant feed rich in fibre. Straw can replace fresh grass and can be used as livestock feed for as much as 10% but if used together with concentrate, straw can replace grass for up to 30% for goats and sheep. The nut straw withered first and then chopped. Farmers in Salit Village have implemented the use of straw during mentoring. Agricultural waste does not cause pollution anymore because there is no more burning after harvest. This shows that the adoption process has been going well. Pollution Data from Agricultural Waste Burning is presented in Figure 6.

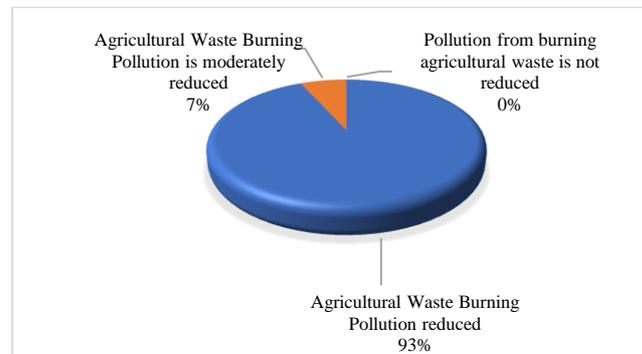


Figure 6. Pollution of agricultural waste burning.

Based on the results of questionnaires filled out by 15 farmers, 93% of the farmers stated that the utilization of agricultural waste is used for the preparation of animal feed can reduce air pollution.

3.4. Increased goat productivity

Knowledge transfer through training on feed preparation and urea manufacture of the herbal mineral block has been carried out. 15 farmers at Salik Village Karo Regency participated in extension and training activities. 95% of participants understood and could re-explain the feed preparation. Goat productivity increases after feeding with the right formulation and herbal supplements. According to [16] the goat farming business is in demand because it is easy to operate with 6-7 months of maintenance to produce lamb and can be fattened in just 3-4 months. Fattening can be carried out by giving the right feed, namely, forage, concentrate, and herbal block. Previously, the maintenance system was still traditional around cages with low nutritious forage. Feed preparation training is very useful for improving the skills of farmers, especially adaptation in terms of using technology. Brochures are used to make it easier for farmers to understand the management of feed preparation and manufacture of herbal mineral blocks. Feed and herbal mineral blocks have been tested on goats showing weight gain of up to 1.85 kg with a daily weight gain of about 70 g/day. Farming from semi-intensive to intensive is an advancement to increase productivity faster. Data on livestock productivity improvement is presented in Figure 7.

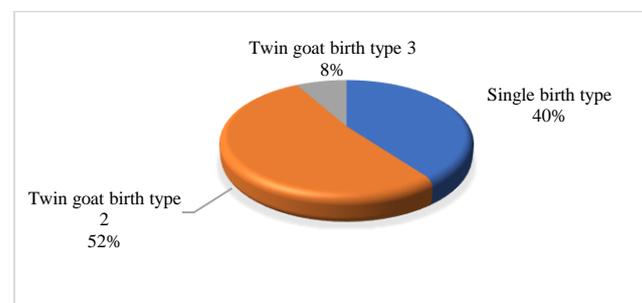


Figure 7. Goat productivity improvement diagram.

Based on the farmer's data goat productivity increased, namely in 10 goats or 40% experienced single type births, as many as 13 goats or 52% experienced multiple type 2 births and as many as 3 goats or 8% experienced multiple kind 3 births. Data on goat births totalled 25 heads compared to the initial data on the number of births per period of 15 charges from 25 females. The appearance of goat productivity results from the interaction

between genetic factors and the environment [17]. Other factors that affect productivity are feed and management [18]. This means that the feed provided has improved quality to increase productivity. The increase in goat productivity in this service is good so the target of community service has been achieved.

3.5. Sustainable farming business

Management of goat farming should pay attention to quality and feed. The quality of the feed will determine the weight and health of the livestock. Feed preparation must pay attention to the quality and nutritional supplements. Science and technology are needed on traditional livestock to increase productivity to increase income. Support from academics is needed so that farmers do not hesitate to develop goat farming businesses.

The community service team plays an active role in mentoring, providing input through appropriate technology and assistance with chopper machines to accelerate livestock feed processing to support the farming business. Sustainable agricultural enterprises are presented in Figure 8.

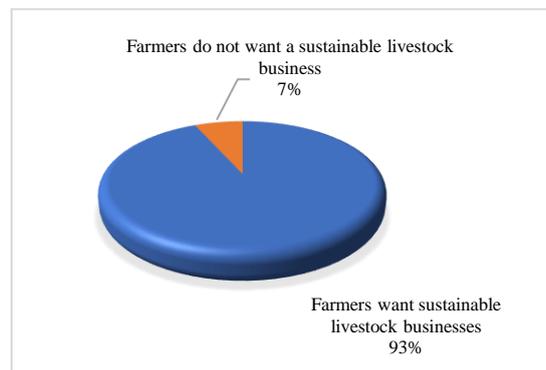


Figure 8. Sustainable agriculture business diagram.

Based on questionnaire data, 14 farmers or 93% want to continue their business in the field of animal husbandry in a sustainable manner, while the remaining 1 farmer or 7% chose to continue but considered the situation and conditions of the age factor. Based on these results, it means that the community service target has been achieved.

4. Conclusions

Community service activities that have been carried out can increase knowledge on goat productivity through feed preparation, increase skills of farmers in manufacturing nutritional supplements (Herbal Mineral Block), reduce agricultural waste pollution, increase goat productivity and increase income through improved management of goat farming. Farmers can apply feed preparation using agricultural waste and combine it with the provision of urea molasses sustainably block herbs to increase the profitability of livestock businesses.

5. Acknowledgements

The authors have expressed gratitude to the Community Service Institute Universitas Sumatera Utara that has funded using NON-PNBP Universitas Sumatera Utara Following the Assignment Letter for the Implementation of Community Service Mono Program, Regular Year 2022: 319/UN5.2.4.1/PPM/2022, 25th May 2022.

References

- [1] Central Bureau of Statistics, District Tiga Panah in Numbers, Karo District Indonesia, 2021
- [2] I. G. M. A. Sucipta, N.W. Siti, I. B. G Partama, I. G. L.O.i Cakra and I.M Mudita, "Supplementation of Urea Molasses Block to Improve the Performance of Peranakan Etawah Goats Fed with Gamal Forage". *J Agripet*. 12(2):49. 2016. (in English)
- [3] Yanuartono, S. Indarjulianto, A. Nururrozi, H. Purnamaningsih, S.Raharjo, "Urea Molasses Block As A Feed Supplement to Cattle" *Jurnal Veteriner*. Vol. 20 No. 3 : 445-451. 2019.

- [4] N.M. Salleh, S. Ismail, and M.R. Ab Halim, “Effects of Curcuma xanthorrhiza extracts and their constituents on phase ii drug-metabolizing enzymes activity” *Pharmacognosy Research*, 8(4), 309–315.
- [5] P. A. Windsor, S. Nampanya, L. Olmo, S. Khounsy B, P. Phengsavanh C and R. D. Bush A, “Provision of urea–molasses blocks to improve smallholder cattle weight gain during the late dry season in tropical developing countries: studies from Lao PDR.” *Animal Production Science*, Vol. 61(5) Pp.503-513. 2020.
- [6] M.R. Garg, P.L. Sherasia, “Successes and failures with animal nutrition practices and technologies in developing countries” *Proceedings of the FAO Electronic Conference*, 1- 30 September 2010, Rome, Italy. Edited by Makkar HPS. FAO Animal Production and Health Proceedings. No. 11. 2011.
- [7] P. Patriani, H. Hafid dan I. Sembiring, “Application of feed supplement urea molasses multi-nutrient block for ruminants in Hamparan Perak District, Deli Serdang Regency North Sumatra Province” *Jurnal Abdimas Talenta*, 5(2) Pp 160–166. 2020.
- [8] C. Antwi, “Small Ruminants Feed Improvement Handbook” Anwomaso. Prisebs Publishers. Hal. 2-21. 2014.
- [9] I. U. Gadzama, I. D. Mohammed, P.P. Barje, S. M. Yashim, S.B. Abdu, S.O. Ereke, “Quality Assessment Of Dusa-Rice Bran MultiNutrient Block (DRMB) In A Semi-Arid Environment Of North East Nigeria” *J Anim Prod Res* 28(1) Pp: 33-48. 2016.
- [10] Focus, “International Focus Information Centre For Small Scale Farmers in Asia: Philippines Council for Agriculture Forestry and Natural Resources and Development (PCARRD) Los Banos” Laguna, 4030 The Philippines. 2005.
- [11] P. Patriani, E. Mirwandhono, U. Hasanah, N. Ginting, “Coffee Seed Waste silage technology as goat feed in Tigapanah Sub-district, Karo regency” *Journal of Saintech Transfer*, Vol. 3, No. 2, Pp 77-85.2020.
- [12] H. Hafid and P. Patriani, “Utilization of fermented rice straw biomass and soybean oil supplementation on digestibility, efficiency, and the bodyweight of local sheep” *ICBB. IOP Conf. Series: Earth and Environmental Science*. 460. 012002. doi:10.1088/1755-1315/460/1/012002. 2020.
- [13] Hasnudi, P Patriani, N Ginting, G A W Siregar, “Management of Goats and Sheep” Edisi Ke 2. Anugerah Pangeran Jaya Press. Medan.2020. (in English)
- [14] R.A. Adawiyah, S. Rusdiana, “Crop and Livestock Farming in Economic Analysis at Farmers' Markets” *Jurnal Riset Agribisnis dan Peternakan*, Vol 1. Pp 37-49.2016. (in English)
- [15] M. Martawidjaja, “Utilization of Rice Straw as a Grass Substitute for Small Ruminant Livestock” *Wartazoa*, Vol. 13 No. 3. Pp 119-127.2003. (in English)
- [16] T. Rostini, I. Zakir, dan R.E. Hidayah. “Improving Goat Productivity in the Cempaka District Goat Livestock Group, Banjarbaru City, South Kalimantan” *Jurnal Al-Ikhlas*. Vol. 3 No. 1, Pp. 22-29. 2017. (in English)
- [17] B. Ahmadu and Lovelace C E A, “Production characteristics of local Zambian goats under semi-arid conditions” *Small Rum. Res*. Vol 45 No.2 Pp 179-183.2022.
- [18] A.A Akingbade, Nsahlai, I.V and Morris C.D, “Reproductive performance, colostrum and milk constituents of mimosine-adapted South African Nguni goats on Leucaena leucocephala-grass or natural pastures” *Small Rum. Res*. Vol. 52 No.3, Pp.253-260