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IDENTIFICATION OF LOCAL FEED POTENTIAL IN BALI CATTLE BREEDING AREA IN KONAWE SELATAN REGENCY

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ABSTRACT

This study was aimed to identify and inventory the availability potentiation of local feed in the South Konawe Bali Cattle Development Area. The material and methods in this study were types of Forage and agricultural waste that potential as animal feed sources. This research was conducted in 2018 in Tinanggea, Palangga, Buke, and Baito Districts, South Konawe Region. Local Forage was feed material that used for the development of cattle in the South Konawe District. The forage potential was calculated based on the feed production of ingredients according to the harvested area and expressed in dry matter (BK). The Forage and agricultural waste types in Konawe Selatan Regency were a) Forage feed, among others; Pennisetum purpureum (Elephant Grass), Apluda mutica (Field grass), Acconopus compresses (pait grass), Cenchrus salaries (foxtail grass), Chrisopogon articulates (Needlegrass); b) Agricultural crop agricultural waste, among others; Rice Straw, Corn straw, Cassava leaves, Sweet potato leaves, Peanut straw, and Soybean straw. The results showed that the production of Forage in South Konawe Bali Cattle Development Area was dominated by field grass (Apluda mutica), namely (a) Tinanggea Subdistrict as much as 23,706.67 tons/year (b) Palangga District as much as 4,128.72 tons/year; (c) Baito Subdistrict as much as 8,077.26 tons/year, and (d) Buke Sub-District as much as 10,712.95 tons/year. Whereas food crop agricultural waste was rice straw feed namely (1) Tinanggea Subdistrict as much as 3,272,780 BK/kg/year; (2) Palangga District as much as 2,982,875 BK/kg/year; (3) Baito Subdistrict as much as 2,756,250 BK/kg/year and (4) Buke Subdistrict with 945,000 BK/kg/year, while corn straw, peanut straw, and cassava leaves cannot be determined.

Keyword: Forage, Food crop agricultural waste, Bali cattle development area

INTRODUCTION

Konawe Selatan Regency is the largest cattle production district in the southeastern province of Sulawesi. Based on data from the Central Statistics Agency (BPS) in 2016, the total population of cattle in the Konawe Selatan Regency is 65,434 cows (BPS, Konawe Selatan District in Figures, 2017). Based on this description, it can be assumed that the reign of South Konawe is a very potential area and, as a development area for the development of Bali cattle seeds, offers the possibility to support the growth of the population of Bali cattle in the region.

The development of animal husbandry in the development zone for cattle seedlings in Bali must be supported by the availability of feed and feed ingredients that come from adequate agricultural byproducts both qualitatively and quantitatively throughout the year, so that the source of feed and agricultural byproducts for them Potential needs to be known, along with the continual increase in the demand for animal feed in the future with the reduced availability of land that can be planted with feed forage due to the shift in the function of open areas such as housing and industry. The ability and availability of feed are one of the most important pillars to increase the production and productivity of female cattle as breeding animals and to produce good cattle germs. The operation or breeding business of cow calves can only continue to grow if feed costs are kept as low as possible, or the use of local resources is optimized and external inputs can be minimized (Diwyanto and Atien, 2008).

Forage materials can be grass that is commonly grown, such as elephant grass, Bengal grass, cypress grass, brachiaria grass, Mexico grass, and various types of weeds. Forage derived from food crops such as multiple types of leaves and stems of rice, corn, and beans can be used as animal feed (Purbajanti, 2013 in Sunarto, K., 2013). Besides, Abadi et al. (2018) state that the low availability of feed in an area triggers that the productivity and animal population in a city cannot be developed. This is due to the low carrying capacity of the feed following the available livestock population, as feed is the most substantial contribution to the livestock. One of the necessary feeds and significant advantages for the life and survival of the animal population is feed (HPT), which is usually administered to cattle with grass and legumes (legumes).

With this potential, the availability of Bali cattle feed should no longer be an obstacle in the field of Bali cattle breeding in the South Konawe district. Based on the description, a study of the potential of the development of Bali cattle breeding and the availability of local feed resources is required in the area of the Bali Cow Cattle Development Center in the Konawe Selatan regency.

MATERIALS AND METHODS

The material in this study is the types of feed and potential byproducts from agriculture as a source of animal feed. This research was conducted in 2018 in the districts of Tinanggea, Palangga, Buke, and Baito, Konawe Selatan District. Animal feed is a local feed ingredient used for the development of Bali cattle in the South Konawe Regency. The potential feed for feed ingredients is calculated based on the production of feed ingredients multiplied by the harvested area and expressed in dry matter (BC). The output of feed samples takes place from the sampling of feed/feed feed. Forage as research material is a group of grasses and legumes (legumes).

The data analysis was carried out descriptively (Mulyadi, 2011), including the identification and evaluation of the availability of local feed ingredients and the study of the sustainability of agricultural byproducts. Assumptions are used to calculate the average forage production, namely: (a) The harvested area of natural grass from rice fields is calculated on the assumption that the grass production from rice fields is up to 30% of the pasture area. b) The harvested area of natural grass from the forest is calculated on the assumption that up to 10% of the grassland grass is produced from the wood. c) The harvested area for a natural lawn, which is obtained through intermediate crops, is 20% of the pasture area. (d) Natural grass consists of different species, namely Apluda mutica (field grass), Acconopus compresses (pait grass), Cenchrus salaries (foxtail grass), Chrisopogon articulates (conifer grass); (e) Meadows (based on observations) consist of 40% Apluda mutica (field grass), 5% Acconopus compresses (pait grass), 30% Cenchrus salaries (foxtail grass) and 25% Chrisopogon articulates (conifer grass).

The availability of feed from agricultural foods is calculated according to the Muller formula (1974), namely (a) rice straw = (2.5 x harvested area x 0.70) tonnes of BK / year; (b) maize straw = (6.0 x harvest area x 0.70) tons of BK / year; (c) soybean straw = (2.5x harvest area x 0.60) BK BK / year; (d) peanut straw = (2.5 x harvest area x 0.60) tons of BK / year; (e) sweet potato leaves = (1.5x harvest area x 0.80) BK BK / year; and (f) cassava leaves = (1.0 x harvest area x 0.30) BK tons / year.

RESULTS AND DISCUSSION

Land Use Evaluation Results

Land use in the Bali Cattle Seedling Development Area of South Konawe Regency is divided into ten types, namely forests, secondary forests, mixed gardens, grasslands, settlements, mangroves, rice fields, shrubs, ponds, and fields. Types of land use can be used as a parameter to calculate forage sources of animal feed, through a reasonably straightforward calculation model using approaches and assumptions, so that forage production is obtained. The data is

processed and calculated based on forage sources (natural grasslands, rice fields, forests, and dry fields/mixed gardens/shrubs/intercrops). For more details can be seen in Table 1.

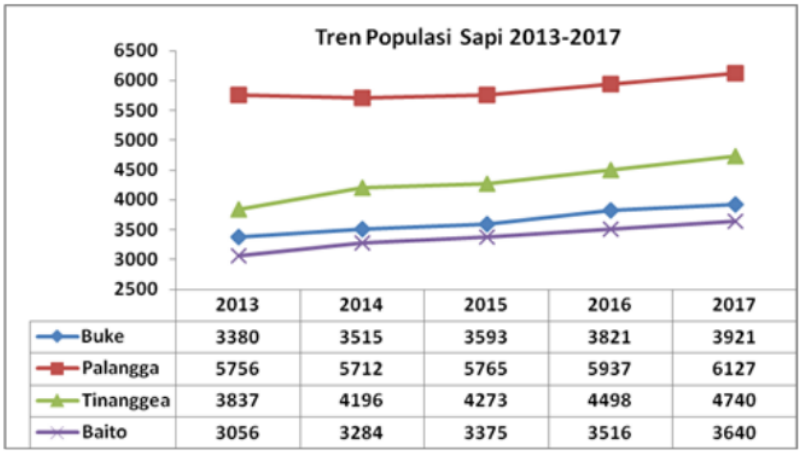
Table 1. Evaluation Results of Land Use in the Bali Cattle Seedling Development Area Konawe Selatan District

No	Land Use	Tinanggea (Ha)	Palangga (Ha)	Buke (Ha)	Baito (Ha)
1	Forest	2998,68	669,97	4191,38	6644,06
2	Secondary Forest	1071,47	7678,8	0	321,12
3	Mixed Gardens	4433,32	498,43	1823,37	557,55
4	Meadow	10945,47	3436,31	4545,54	3053,53
5	Settlement	312,59	338,74	512,84	256,82
6	Mangrove	6942,01	710,56	0	0
7	Rice fields	1777,62	3563,39	339,14	780,94
8	Shrubs	915,57	644,85	347,4	
9	Pond	71,04	241,94	0	0
10	Moor	6006,21	17783.00	6801,33	3656,97
	Total	35473,98	17782,99	18561	15270,99

Source: Primary Data Analysis, 2018.

Bali Cow Cattle Population

South Konawe Regency is one of the leading regions in the development of Bali cattle in Southeast Sulawesi Province. The total population of Bali cattle in the Bali cattle breeding area in the Konawe Selatan District has increased throughout the year in the period between 2013-2017. Increasing cattle population in South Konawe District shows excellent performance, as one indicator of the performance of the livestock sector. The distribution of cattle population in the Konawe Selatan Regency can be seen in Figure 1



Source: Konawe Selatan District PKH Service, 2018.

Fig 1. Bali cattle population in development areas for Bali cattle seedlings in Konawe Selatan Regency in 2013-2017

The cattle population in Figure 1 above shows a positive upward trend. The highest rate of population increase during the 2013-2017 period was found in Tinanggea District, which

reached 23.5%, following Baito 19.1%, Buke 16.0%, and the lowest in Palangga District which was 6.4% for four years. The data confirm that the determination of Tinanggae, Palangga, Baito, and Baito Districts as areas for development of Bali cattle breeding in Konawe Selatan District is appropriate because, in addition to having a high cattle population, all four sub-district areas are generally breeders developing Bali cattle.

Green food is sourced from grass

Forage needs will increasingly be following the increasing number of cattle population owned. The problem of feed in this region is the availability of highly fluctuating feed ingredients and the quality of feed that does not yet meet the needs of cattle. During the rainy season, forage production will be abundant, whereas, in the dry season, the production level will be low, or even not produce at all. Limitations of conventional feed sources can be overcome by using feeds based on crop byproducts and the agricultural industry derived from rice, palm oil, and sugar cane (Ilham, 2015).

Sustainability of forage supply is highly dependent on various factors, such as seasons, agroecosystems, ruminant livestock populations, and their management (Prawiradiputra, 2010). Factors that must be considered to get high quality and high productivity forage include site selection, area mapping, land management, seed selection, planting, fertilizing, maintaining, harvesting, and efforts to maintain and improve postharvest quality until the Forage is consumed by livestock. Thus, for farmers who want to have a stock of feed near their livestock pens throughout the year, the factors mentioned above should be a concern.

The availability of fodder forages and crop byproducts of food crops as a source of feed in the Bali cattle breeding area of South Konawe District is sufficiently available. However, it still needs to be analyzed to find out the amount of Forage available and the ability to meet the needs of feed for livestock populations in the development area Bali cattle breeding Konawe Selatan Regency.

Types and Forage Production of Animal Feed

The feed is a significant component in beef cattle business because feed is an absolute necessity for cattle to live, grow, and develop. The availability of feed both in quantity and quality is the dominant factor affecting Bali cattle productivity. The limited availability of Forage is the leading cause of the difficulty in developing business scale and the ownership of cattle. It is a barrier to the development of Bali cattle breeding. Providing quality feed is also increasingly difficult for farmers to do because the price of reinforcing feed, especially konpengantant, is getting more expensive and difficult to obtain.

Furthermore, Adrial and B. Haryanto (2016) stated that there are several types of potential feed ingredients that are available and have been used to feed cattle in the form of grasses, leaves, and agricultural products. This feed potential has not been optimally utilized for the development of beef cattle. The problem of feed is the availability of highly fluctuating feed ingredients and feed quality that does not yet meet the needs of animals. Feed management applied by breeders has not been able to optimize the utilization of the potential of existing local feed. It has not been able to meet the life needs of cattle for optimal production.

According to Feriani et al., (2014) that livestock production will largely depend on the carrying capacity of feed, which is reflected in the area of Forage and the remnants of agricultural products. The utilization of farming byproducts as ruminant animal feed ingredients is an alternative to meet the nutritional needs of livestock. Sources of feed ingredients derived from cultivated plants are decreasing, so that feed derived from the agricultural, fishery, and plantation byproducts and the industry has the potential to be used as feed. The feed ingredients can be either processed or unprocessed/raw materials whose availability is sustainable /continuous (MI, 2017).

The forage source in the Bali Cattle Seedling Development Area of South Konawe Regency is an illustration of the region's ability to provide feed for the existing Bali cattle. For more details can be seen in Table 2.

Table 2. Forage Sources Based on Land Use in the Bali Cattle Seedling Development Area Konawe Selatan District

Forage Resources	Tinanggea (Ha, Kg)		Palangga (Ha. Kg)		Baito (Ha, Kg)		Buke (Ha, Kg)	
	Area	Production	Area	Production	Area	Production	Area	Production
Natural grass	7661,83	6178,00	524,00	6178,00	2137,47	6178,00	3181,88	6178,00
Alang alang	3283,64	6336,00	4630,00	6336,00	916,06	6336,00	1363,66	6336,00
Rice fields	1777,62	1853,40	1561,00	1853,40	780,94	1853,40	339,14	1853,40
Forest	2998,68	617,80	4110,34	617,80	6644,06	617,80	4191,00	617,80
Intercropped plant	5491,00	1235,60	1337,00	1235,60	1162,00	1235,60	3162,00	1235,60

Source: Primary Data Analysis, 2018.

Table 2 states that forage production takes place based on land use in the correct feed sources, in the natural grass, in reeds, in the rice fields, in the forests, and the intermediate crops. Based on the calculation of these forage sources, the types and forage production of animal feed in the Bali cattle breeding area in the South Konawe District are presented in Table 3

Table 3. Types and Production of HPT Feed in the Bali Cattle Seedling Development Area Konawe Selatan District.

Forage Grass Type	Tinanggea (Ha, Ton)		Palangga (Ha, Ton)		Baito (Ha, Ton)		Buke (Ha, Ton)	
	Area	Production	Area	Production	Area	Production	Area	Production
Pennisetum purpureum (Rumput Gajah)	6	240	25	1,000	9	360	28	1,120
Apluda mutica (Rumput lapang)	3837	23707	668	4,129	1307	8077	1734	10713
Acconopus compressus (Rumput pait)	480	2963	84	516	163	1010	217	1339
Cencrus siliaris (Rumput ekor rubah)	2878	17780	501	3,097	981	6058	1301	8035
Chrisopogon ariculatus (Rumput jarum)	2398	14817	418	2,580	817	5048	1084	6696

Source: Primary Data Analysis, 2018.

Based on Table 3 shows that forage production in the Bali Cattle Seedling Development Area South Konawe Regency namely (a) Tinanggea District is dominated by field grass (Apluda mutica) as much as 23,706.67 tons/year and the lowest is elephant grass as much as 240 tons/yr; (b) Palangga subdistrict is dominated by field grass (Apluda mutica) as much as 4,128.72 tons/year and the lowest is pait grass (Acconopus compressus) as much as 516.09 tons/yr; (c) Baito District is dominated by field grass (Apluda mutica) as much as 8,077.26 tons/year, and the lowest is elephant grass as much as 360.00 tons/yr, and (d) Buke District is dominated by field grass (Apluda mutica) of 10,712.95 tons/year and the lowest is 1,120 tons/year of elephant grass.

Forage feeds come from agricultural products

Agricultural byproducts are part of crops on the ground or shoots, stems left after harvesting, or the main results are taken, classifying agricultural byproducts into pre-harvest, harvest, and postharvest waste. Postharvest waste is divided into two, namely, residue before processing and after processing waste or often known as agricultural, industrial waste.

The availability of feed sources must also take into account their quality to support livestock production. To develop livestock

populations, the adequacy of both quantity and quality of feed must be guaranteed. Still, in reality, the provision of reasonable feed-in amount and quality has become increasingly tricky (Sitindoan, 2013), because most of the land designated as a source of Forage has changed functions accompanied by increasingly intensive processing of paddy fields due to the availability of irrigation facilities so that the impact is increasingly limited areas for grazing and also farmers are frequently challenging to get Forage. To overcome the problem of food availability, one of them is the utilization of agricultural byproducts as feed (Kasryno and Syafa'at, 2000) through an integrated farming system (integrated farming system) in the farming sector, such as between the food crops and livestock subsectors (Syamsu et al ., 2010). In this connection, the Crop-Livestock System (Crop Livestock) approach is very relevant to be applied (Soeharsono, 2008). The types and production of feed originating from agricultural products in the Bali cattle breeding area in the South Konawe Regency can be seen in Table 4.

Table 4. Types and Feed Production of Agricultural Crops Produced in the Bali Cow Cattle Breeding Area in South Konawe Regency

Types of Food Plants	Tinanggea (Ha, Ton)		Palangga (Ha, Ton)		Baito (Ha, Ton)		Buke (Ha, Ton)	
	Area	Production	Area	Production	Area	Production	Area	Production
Rice Straw	1,870	3,272,780	1,704.50	2,982,875	1,575	2,756,250	540	945,000
Corn Straw	61	274,500	290	1,305,000	-	-	44	198,000
Cassava leaves	104	31,200	10	3,000	-	-	52	15,600
Sweet potato leaves	14	16,800	10	12,000	14	16,800	40	48,000
Peanut straw	14	21,000	15	22,500	-	-	46	69,000
Soybean peanut straw	125	187,500	65	97,500	21	31,500	21	31,500

Source: Primary Data Analysis, 2018.

Based on Table 4, it shows that the feed produced by crops in the Bali Cattle Seedling Development Area in South Konawe Regency, namely (1) The highest sub-district is feed originating from rice straw as much as 3,272,780 BK/kg/year and the lowest is sweet leaf potato as much as 16,800 BK / Kg/year; (2) Palangga sub-district the highest food is feed sourced from rice straw as much as 2,982,875 BK/kg/year and the lowest is cassava leaves as much as 3,000 BK / Kg/year; (3) Baito District that the highest food crop byproduct is food which is sourced from rice straw as much as 2,756,250 BK/kg/year and the lowest is sweet potato leaves as much as 16,800 BK / Kg/year. Whereas corn straw, peanut straw, and cassava leaves cannot be calculated; and (4) Buke Subdistrict that the highest agricultural food crop byproducts are 945,000 BK/kg/year of rice straw and the lowest is 15,600 BK / Kg/year of cassava leaves.

CONCLUSION

Based on the results of this study, the conclusions that can be drawn are the types and sources of animal feed in the form of HPT and the results of the follow-up of agricultural food crops in general in the South Konawe District, namely a) Animal feed, among others; Pennisetum purpureum (Elephant Grass), Apluda mutica (field grass), Acconopus compresses (pait grass), Cenchrus salaries (foxtail grass), Chrisopogon articulates (needle grass); b) The follow-up of crops, among others; Rice straw Corn straw, cassava leaves, sweet potato leaves, peanut straw, and soybean straw. While HPT production in the Bali Cattle Seedling Development Area of South Konawe Regency, namely (a) Tinanggea District is dominated by field grass (Apluda mutica) as much as 23,706.67 tons/year (b) Palangga District is governed by field grass (Apluda mutica) as much as 4,128.72 tons/year; (c) Baito District is governed by field grass (Apluda mutica) as much as 8,077.26 tons/year, and (d)

Buke District is governed by field grass (Apluda mutica) of 10,712.95 tons/year. At the same time, the feed from crops is rice straw, namely (1) Tinanggea District as much as 3,272,780 BK/kg/year; (2) Palangga District as much as 2,982,875 BK/kg/year; (3) Baito District 2,756,250 BK/kg/year and (4) Buke District 945,000 BK/kg/year, while corn straw, peanut straw, and cassava leaves cannot be calculated.

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