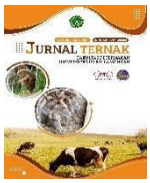
JURNAL TERNAK
Volume 15 (1) 2024 pp. 1-5
ISSN 2684-6799 (Online)
ISSN 2086-5201 (Print)

Available online

S4-Accredited – SK No. 85/M/KPT/2020
Journal Page is available at http://www.jurnalpeternakan.unisla.ac.id/index.php/ternak/index



Potential of UNISKA's Integrated Laboratory Forage Land To Fulfilling Carrying Capacity In Dry Season

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ARTICLE INFO

Article history:
Received 20 April 2024
Revised 3 Mei 2024
Accepted 3 Juni 2024

Keywords: [Keyword heading]
Forage production
Carrying capacity
Dry season

IEEE style in citing this article: [citation Heading]
B. S. Wahyudi, E. S. H. Sosiawati, and B. D. Dianingtyas, "Potential of UNISKA's Integrated Laboratory Forage Land To Fulfilling Carrying Capacity In Dry Season," Jurnal Ternak : Jurnal Ilmiah Fakultas Peternakan Universitas Islam Lamongan, vol. 15, no. 1, pp. 1-5, 2024. [Fill citation heading]

ABSTRACT

The research aims to determine the potential of UNISKA's Integrated Laboratory forage land in fulfilling carrying capacity in dry season. This research was carried out in September - October 2023. This research used case study methods, measurements and direct observations in the field. Carrying capacity is measured using a comparison method between livestock feeding units and livestock units for livestock. The research results showed that UNISKA's Integrated Laboratory forage land has land area of 0,6433 ha. Dry matter of grass production is 1729,403 kg/0,6433ha, while dry matter of legumes is 120,286 kg/0,6433ha. The conclusion is carrying capacity of UNISKA's Integrated Laboratory forage land in dry season is 7,878 AU/ha.

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1. Introduction [Heading of Section]

Forage for livestock is an important thing that can affect livestock productivity, for this reason forage for livestock (feed) must be considered for its availability. In addition, good forage must have a sufficient amount and its availability continuously throughout the year. One way to find out the adequacy of forage production is to calculate the carrying capacity. Carrying capacity is the ability of pasture to produce forage required by a number of livestock grazed in one hectare or the ability of pasture to accommodate livestock per hectare. Carrying capacity can also be interpreted as the ability of the pasture to accommodate livestock or the number of livestock that can be kept per unit area of pasture. The forage production of each grazing land is different. This difference in forage production is influenced by several factors, namely, plant care management, climate, plant species, and

https://doi.org/10.30736/jt.v15i1.233
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ISSN 2684-6799 (Online)
ISSN 2086-5201 (Print)

environmental conditions. Measuring forage production on grazing land is very important in determining opportunities for developing the livestock being cultivated [1]. The main advantage of forage as ruminant feed is that it is a feed that is easy to obtain in various situations, while the disadvantage is that it is not available on an ongoing basis, especially during the dry season [2]. Forage land for livestock at the Integrated Laboratory of the Faculty of Agriculture UNISKA, during the dry season, forage production decreases by around 50%, which can be seen during the dry season, where grass is cut that is not yet harvest time but has already been harvested to meet the livestock's daily needs. This is inversely proportional to the rainy season, where the grass is harvested, which can even exceed the maturity of the harvest and exceed the needs of livestock. Meanwhile, the presence of livestock in the Integrated Laboratory of the Uniska Faculty of Agriculture remains relatively constant and even increases. Based on the description above, researchers want to know carrying capacity values of sheep and cattle during the dry season, so that they can be used for making management decisions.

2. State of the Art

2.1. Forage production

The production of forage for livestock is an animal feed material obtained from grass and legumes that must be available sustainably in both quality and quantity [3]. Forage for livestock is an important thing that can affect livestock productivity, for this reason forage for livestock (feed) must be considered for its availability. In addition, good forage must have a sufficient amount and its availability continuously throughout the year. Forage production can be measured through the identification of the botanical composition of a land.

Botanical composition is a number used to determine the quality assessment of natural pastures or grazing fields that can affect livestock activities [4]. Botanical composition is evaluated by randomly placing quadrants to obtain the type of vegetation, and the distribution of the types of formations in the grassland. Botanical composition can also be used as an indicator of disturbances in vegetation communities by observing the distribution patterns of vegetation in the community[5].

Grazing fields that have good quality plant species will improve the quality of their forage [6]. The botanical composition of grazing fields for grazed cattle and forage components given for cattle in cages, greatly affect livestock production and performance. The botanical composition can be calculated by the "Dry Weight Rank" method [7], with the ideal ratio between the components of grass and feed legumes for ruminant livestock is 60:40%.

2.2. Carrying capacity

Carrying capacity is the ability of a grazing field to produce forage needed by a number of livestock grazed in an area of one hectare or the ability of a grazing field to accommodate livestock per hectare. Carrying capacity is the amount of forage that can be provided for livestock declared animal unit/hectare [8]. The availability of ruminant animal feed, especially forage in dryland agriculture is greatly influenced by the season, the rainy season of abundant forage and in the dry season there is a shortage of forage so that the quantity, quality and continuity of forage feed are not guaranteed throughout the year so that livestock cannot produce optimally [9]. The calculation of the carrying capacity of a land to the number of livestock raised is based on the production of available forage for livestock. This calculation is used by the norm of Animal Units (AU), which is a measure used to relate the body weight of livestock to the amount of livestock feed consumed.

3. Method

The research uses survey methods, measurements and direct observations in the field. The research was carried out at the Integrated Laboratory of the Faculty of Agriculture, Uniska, data analysis was carried

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ISSN 2684-6799 (Online)
ISSN 2086-5201 (Print)

out at the agrotechnology laboratory of the faculty of agriculture, and the Food and Livestock Security Service in Kediri. This research was carried out for 2 months from September 1 2023 to October 31 2023.

The method used in this study is a case study. Methods of taking measurement data and direct observation in the field. Measurement of botanical composition using the "Dry Weight Rank" method [7] using a measuring quadrant of 1m x1m. The data obtained are tabulated and calculated to obtain the total botanical composition and capacity, in addition to that it is done by calculating the adequacy of dry matter for cattle and sheep to support information related to the results of the carrying capacity analysis.

4. Results and Discussion

Forage Production

Forage production is animal feed material obtained from grass and legumes which must be available sustainably in both quality and quantity [3]. The results of research on livestock forage production are presented in table 1 as follows.

Table 1. Average forage production for livestock at the Uniska Faculty of Agriculture Integrated Laboratory during the dry season

Botanical composition	Production of dry matter (kg/0,6433ha)	Production of dry matter (kg/ha)
Grass	1729,403	3119,224
Legumes	120,826	178,208

The grass land at the Integrated Laboratory of the Uniska Faculty of Agriculture during the dry season has dry matter production of 3119,224 kg/ha. Meanwhile, production for dry matter of legume production was 178,208 kg/ha. Botanical composition in UNISKA's Integrated Laboratory forage land have 76,029% of grass, 21,524% of legumes, 2,445% of weeds [10]. This figure is lower than during the rainy season, where during the rainy season you can sell to other breeders, during the dry season it is inversely proportional to the rainy season, where harvesting or cutting is done when the grass has not yet entered cutting time. Forage production in the dry season is 0.5 x rainy season production [7]. The results of observing forage production are factors that influence low or high forage production results are the alternation of the rainy season and the dry season. Forage production in pastures is influenced by the season [11], and is also that the dynamics of growth phenology and dynamics of natural pastures are very dependent on water availability [12]. According to [13] that natural pastures have the highest forage production and quality at the end of the rainy season, and the lowest production and quality at the end of the dry season.

Carrying capacity

Carrying capacity is the ability of the pasture to produce forage required by a number of livestock grazed in one hectare or the ability of the pasture to accommodate livestock per hectare [14]. Capacity is closely related to forage productivity in a livestock grazing area [5]. The results obtained in this research show that the livestock capacity in the forage area for livestock at the Integrated Laboratory of the Faculty of Agriculture, Uniska during the dry season is 7,878 AU/ha. This figure obtained in the research was estimated based on the results of measuring livestock forage production obtained during

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ISSN 2684-6799 (Online)
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data collection which was estimated using the formula voisin (Y-1)s = r where Y = land area requirements per year versus monthly requirements while s = grazing period (30 days) and r = rest period (70 days).

5. Conclusions

The results of the research can be concluded that the production of dry matter forage UNISKA's Integrated Laboratory forage land during the dry season are 1729,403 kg/0,6433ha of grass production, 22,857 kg/0,6433ha of legumes production, with a carrying capacity of 7,878 AU/ha.

6. Acknowledgment

The authors would like to thank "Hibah Internal LPPM UNISKA Kediri" for funding this research.

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