Original Research Article

Correlation between Sheep Body Condition Score ~~(BCS)~~ and Lambing Interval in Langkat District of Indonesia

ABSTRACT

Aims: To find out the relationship between Body Condition Score and the reproductive performance of sheep in Langkat Regency, namely Service Per Conception and Lambing Interval
Study design: Deskriptif analysis
Place and Duration of Study: Langkat Regency, Indonesia, between November 2022 and January 2023.
Methodology: The method used in this research is a case study, namely by collecting primary and secondary data. The observed variables are Body Condition Score (BCS) and Lambing Interval
Results: The value of the Body Condition Score with Lambing Interval regression equation Y = 15.677-0.818X. (R2) 12.8%. (r) of 0.358. The relationship between Body Condition Score and Calving Interval is positive, with an R2 value of 12.8%.
Conclusion: The relationship between the lambs' Body Condition Score (BCS) and the Lambing Interval had a good correlation with an average Calving Interval ranging from ≤8 to 9 months.

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Keywords: Body Condition Score, Lambing Interval, Sheep.

1. INTRODUCTION

Sheep is one of the good livestock commodities that can be beneficial to meet food needs, especially animal protein [1]. The reason for increasing the role of sheep ~~livestock~~ farming is to support efforts to increase food security both as a provider of food and nutrition and as a source of income, both of which increase food availability and accessibility [2]. To achieve this program needed to increase the production and productivity of sheep,. ~~g~~Good livestock production will also follow reproductive processes that generally run [3]. The higher the reproductive increase, the higher the productivity of the livestock [4].

Reproductive technology increases national meat production [5]. Artificial Insemination is one way to improve genetic quality because this method effectively increases the quality and quantity of sheep [6] production. To increase the sheep population, Artificial Insemination must accelerate the improvement of sheep's genetic quality and increase lamb birth [7].

The success of Artificial Insemination in sheep is an essential factor in efforts to increase the sheep population in Indonesia. Most sheep breeders by smallholder breeders

with little capital, low technological adaptation, and shared knowledge of sheep farming coupled with traditional maintenance patterns [8]. It causes efforts to increase the population to be constrained, and the genetic quality of existing sheep could be better, resulting in a low ~~BCS (B~~body c~~C~~ondition score(BCS) [9]. The ~~Body Condition Score (~~BCS~~)~~ of lambs when giving birth is highly correlated with subsequent reproduction [10].

Langkat Regency is where many people farming~~do~~ sheep ~~farming~~ to increase their income. Breeders only consider the livestock business a sideline, and the labor comes from family members [11]. To support the implementation of animal husbandry development, primarily sheep, to maximize the productivity of sheep livestock. Objective data and information are needed, actual, and meet information standards [12]. To find out the reproductive potential of sheep in Langkat Regency necessary to evaluate the reproductive properties of sheep. This observation is necessary to obtain data on the level of reproducibility and reproductive efficiency of sheep in terms of the body condition of the mother sheep.

The Body Condition Score ~~(BCS)~~ is related to livestock reproduction, such as estrus, pregnancy, the birth process, and the condition of lambs [13]. Parent body shape and size, age, parity, and heredity also strongly influence the reproductive system [14]. Ideally, the sheep should have a ~~Body Condition Score (~~BCS~~)~~ of 3 (moderate) on a scale of 1-5. If the sheep has a bodyweight exceeding the ideal body weight, the livestock will experience reproductive disorders and potentially be affected by metabolic diseases. However, if the lamb has a body weight that is less than ideal, it can disrupt the reproductive system [15].

Sheep Body Condition Score ~~(BCS)~~ is a level of body fatness that can describe live weight combined with body size. The BCS value is the result of assessing the condition of muscle and fat in the loin. It is helpful as an indicator to evaluate changes in the nutritional status of brood stock from time to time [16]. The BCS value of each sheep varies significantly due to various factors, including age, sex, and management of livestock rearing.

This research is essential to maintain the sustainability of the sheep farming business in Langkat Regency. Efforts to maintain an ideal body condition according to physiological status can use the BCS ~~(Body Condition Score)~~, which is a method to score the body condition of cattle both visually and by touch [17]. BCS determination in lambs has several advantages: easy to learn, not requiring special equipment, and is entirely accurate, cheap, and straightforward. BCS is necessary to apply to maintenance management on sheep farms in Langkat Regency because it is effective and efficient, especially in livestock breeding programs.

2. MATERIAL AND METHODS

Research Approach

This research approach is descriptive quantitative research that describes the condition of the variables obtained by the sheep farming business actors. The scope of this research is in Langkat Regency, North Sumatra Province what scope ???. The method used in this study was direct interviews with farmers using a questionnaire. The research location was purposively (intentionally) considering that it is one of the areas with great potential in efforts to develop a sheep farming business.

The material in this research is sheep farmers related to all the data and field studies obtained, namely the Body Condition Score and the interval symbol of sheep. Research design by making observations ~~(observations)~~ to study the difficulties that arise. The results of observations made scenarios that support and create a flow of problems. The second stage is the data analysis stage. The third stage is data interpretation by interpreting the results of the predicted values of each variable and comparing them with the theory and results of previous studies. Interpretation can prove the theory, challenge the theory, and develop a new theory as a reference for research results. ~~The next stage is drawing~~

~~conclusions, where this stage concludes the results achieved and recommends them to related parties.~~

Location and Time of Research

This research ~~will be~~was carried out from November 2022 to January 2023 in Langkat Regency because this area has excellent potential to develop a sheep farming business. Respondent requirements are sheep breeders in the study area. The research method used was~~is~~ a survey method with a unit of analysis of breeders who raise sheep.

Variable Operational Parameters

The research parameters observed were: Body ~~Conditon~~Condition Score, service per conception, and the relationship between Body ~~Conditon~~Condition Score and service per conception.

Body Condition Score (BCS)

The BCS assessment is by observing and feeling the fat deposits on the body parts of the animal, namely on the back and quarter of the back, such as on the spinous process, spinous process to transverse process, transverse process, look hungry, tuber coxae (hooks), between the tuber coxae and tuber is chiatic (pins), between the tuber coxae right and left, and the base of the tail to the tuber is chiatic. Sheep have a score of 1 fragile, score two thin, score three moderate, score four fat, and five very fat.

Lambing Interval

Lambing interval is the distance or interval of time to give birth from the first birth to the second birth. The shorter the lambing interval, the more reproductive efficiency in livestock will increase.

Population and Sample

The population in this study were all sheep farmers in Langkat Regency. In this study, sampling by the census. The census method is also known as the complete enumeration method, in which all individuals in the population are investigated or interviewed as respondents [18].

3. RESULTS AND DISCUSSION

Body Condition Score (BCS)

The body's energy reserves can be known using a visual assessment method such as the Body Condition Score ~~(BCS)~~. The relative score obtained from the BCS assessment helps farmers obtain an overview of the level of muscle reserves and body fat of each sheep, which can see in Table 1.

Table 1. Research data based on the total Body Condition Score (BCS) of sheep in Langkat Regency.

BCS	Total	Percentage (%)
1	6	7,59
2	41	51,90
3	32	40,51

source : data processed (2023)

Based on t~~T~~able 1 above, the results of the research data for the Body Condition Score ~~(BCS)~~ of sheep in Langkat Regency with the first highest score in Body

Condition Score (BCS) 2 with a percentage of 51.90%, second in Body Condition Score (BCS) 3 with a percentage of 40 .51%. In comparison, the lowest score in the Body Condition Score (BCS) 1 with a percentage of 7.59%. Body condition scores that are too low (<2.00) tend to cause conditions that cause ovarian hypofunction, where the ovaries will shrink, the surface is smooth (without follicles/corpus luteum), and the uterus is not talus with a soft consistency [10]. Livestock with skinny bodies have less fat reserves, resulting in low reproductive rates. Fat is an energy reserve stored in the animal's body that comes from nutrients in the feed. Lack of energy consumption in young sheep will cause delayed growth and reproduction [19].

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Lambing Interval (LI)

Lambing Interval is the period from the date of lambing until lambing again or the distance between lambing from one lamb to the next~~. Can be seen in (~~Table 2).

Table 2. The results of the research on the number of sheep lambing intervals in Langkat Regency.

LI	Total	Percentage (%)
≤8 s/d 9 month	36	45,57
9 s/d 10 month	32	40,51
11≥ month	11	13,92

source : data processed (2023)

Based on Table 2, ~~t~~The results of the Lambing Interval study of sheep in Langkat Regency with the first highest percentage value of Lambing Interval of 45.57% at a distance of ≤8 to 9 months, the second with a Lambing Interval percentage value of 40.51% at a distance of 9 to 10 months and the lowest is found in the Lambing Interval with a percentage value of 13.92% at a distance of 11≥ months. The ideal spacing of kid~~children~~ is eight months. Factors affecting reproductive efficiency are the length of the Lambing Interval, including Service Per Conception (S/C), the accuracy of mating, and whether there is a pregnancy [20].

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Relationship between Body Condition Score and Lambing Interval

The lambing interval is between birth and the next or previous birth. In this study, the lambing distance between one sheep and another had variations in each Body Condition Score (BCS) group~~, as seen in(~~ Table 3).

Table 3. *Lambing Interval in various groups of Body Condition Score (BCS).*

	BCS		
	1 (n = 6)	2 (n = 41)	3 (n = 32)
CI	14,17±1,94	14,24±1,34	13,09±1,12

source : data processed (2023)

The results showed that the Body Condition Score (~~BCS)~~ 1, 2, and 3 showed a difference of one and two months. It means it is still in average condition. The ideal birth spacing is eight months [8]. The relationship between Body Condition Score (BCS) (X) and Lambing Interval (Y) has a regression equation Y = 15.677-0.818X, which means that for every addition of Body Condition Score (BCS) 1 point, the Lambing Interval will decrease by 0.818%, with a

coefficient of determination (R2) 12.8% means that the Body Condition Score (BCS) contributes 12.8% to the Lambing Interval. In contrast, the remaining 78% comes from other factors. Value (r) correlation coefficient of 0.358. Other factors that affect the value of the Lambing Interval are if there is a long calving interval primarily due to long DO (Days Open). It is due to

1. the child is not weaning, so the appearance of the first post-partum heat takes a long time,
2. breeders marry their mothers after giving birth for an extended period so that their vacancy becomes long,
3. high failure of artificial insemination resulting in high Service Per Conception (S/C),
4. the age at first mating is slow.

Several factors strongly influence the occurrence of pregnancy in sheep, including environmental conditions, especially nutrition before and after lambing [21].
Balanced nutritional needs are essential for the continuity of sheep reproduction [22]. Suppose nutritional deficiencies in protein, energy, minerals, and vitamins will cause late estrus, silent heat to anestrus [23]. Lack of protein causes weak estrus, estrus, anestrus, repeated breeding, early embryonic death, absorption of dead embryos by the uterine wall, weak childbirth, or premature birth [7]. In addition to nutritional influences, mineral deficiencies, and imbalances also affect repeated mating, ovarian activity, and low reproductive efficiency [20].

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4. CONCLUSION

The relationship between the lambs' Body Condition Score (BCS) and the Lambing Interval had a good correlation with an average Calving Interval ranging from ≤8 to 9 months.

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