

Body Condition Score, lactation length, dry period on milk production of dairy cow at PT. Ultra Peternakan Bandung Selatan

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Abstract. This study aims to determine the effect of body condition score (BCS), lactation length, and dry period on milk production of dairy cows at PT. Ultra Peternakan Bandung Selatan (UPBS). The research was conducted at PT. UPBS, Pengalengan, West Java, the following method used is survey method, where the data of primary and secondary data using 130 lactating dairy cows. Complete milk production records as variable y and BCS, lactation length, and dry period as variable x. The effect of BCS, duration of lactation, and dry period were analyzed using multiple linear regression analysis. The results of this study discovered that each factor of BCS, lactation length and dry period duration a very significant effect ($P < 0,01$) with a coefficient of determination (R^2) of 76.2%, average milk production $7835 \pm 631,33$ kg, BCS score $3,25 \pm 0,26$; lactation length is $346 \pm 65,26$ days, and dry period (R^2) is $77 \pm 33,18$ days. The conclusions of this study; to optimize milk production, the implementation of dairy cows maintenance needed on BCS, lactation length, and optimal dry period according to the recommendations.

1. Introduction

Milk demand in Indonesia continues to increase from year to year along with the increase in the population of Indonesia, while milk production has decreased every year. Based on data from the BPS (Central Statistics Agency) 2021, it is recorded that the demand for milk in 2020 is 4.385,73 thousand tons, while domestic milk production is 997,35 thousand tons per year or only meets 22% demand, meaning that Indonesia facing milk production deficit so that imports are needed. % [1]. To increase milk production in a dairy farming business that provides a good level of production efficiency, the dairy cows that are kept must be able to convert feed into milk production efficiently [2]. Production efficiency is also determined by the amount of milk produced during a productive phase. Although genetic factors greatly affect milk production, a number of non-genetic factors are known to be dominant factors in influencing production efficiency during the productive phase of dairy cows [3].

The increase of milk production during the productive phase, it is necessary to optimize the following factors affecting the milk production of dairy cows, for example, the body condition score (BCS) is one of the factors that play an important role in milk production. BCS can be used for estimating the status of nutrition and knowing the production status of cows. BCS has been used as a practical and important tool in assessing the body condition of livestock because BCS is a simple

indicator that is best to indicate available body fat location and can be used to assess livestock in any period.

The length of lactation links with milk production during its productive phase and in this case, it is also related to the reproductive performance of dairy cows such as significant time without being milked can cause the length of the lactation period is expected to last 305 days (8 months) will be decreasing gradually [4]. Another factor that has an important role with ability to increase milk production is to observe the length of the dry period, starting from the time the cow is stopped from milking until the cow shows calving again to improve udder tissue, prepare for birth and optimize milk production for the next lactation. The normal dry period in dairy cows is around 60-70 days before the partus [5]. Good dry management needs to be carried out so that the milk produced is optimal to provide maximum profit for the farm.

PT. Ultra Peternakan Bandung Selatan (UPBS) Pangalengan is one of the dairy farm in major milk producing located in Bandung Regency, West Java. While the raising the dairy cows refers to modern management and standards, the problem that concerns is a solution to increase milk production in Indonesia by paying attention to the factors that affect milk production while genetic factors are also being considered as a reference among smallholder farmers in Indonesia. Based on this case, it is necessary to conduct research on the effect of body condition score, lactation period, and dry period length on dairy cow milk production at PT. Ultra Peternakan Bandung Selatan.

2. Materials and methods

2.1. Sample preparation

The direct survey was conducted in November-December 2020 at PT. UPBS. The sample used was 130 of third-lactation FH. Two types of data, primary data collected by interview and direct observation and secondary data was taken from Management Information System (MIS) office including milk production data (kg) as the dependent variable (Y), body condition score (BCS), lactation length, and dry period as independent variables (X). BCS was examined by the experts and milk production data is equivalent to 305 days.

2.2. Data analysis

In this study, the researcher analyzed the data obtained using multiple linear regression according to [6] with IBM SPSS Statistics version 25 for windows.

3. Results and discussion

Table 1. presents the effect of BCS, lactation length, and dry period on milk production of dairy cows at PT. UPBS and Table 2. indicate the average results of these parameters.

Table 1. Multiple Linear Regression Results

Parameter	Linear Regression	Signification
Constanta	11141,305	0,00 ^{*)}
Body Condition Score (score)	-545,469	0,00 ^{*)}
Lactation length (day)	-1,873	0,00 ^{*)}
Dry period (day)	-11,534	0,00 ^{*)}
Coefficient of Determination (R ²)	0,762	

Notes: ^{*)} has a significant level of 1%.

Table 2. Average milk production, BCS, duration of lactation, days dry on PT.UPBS

Parameter	Total	Mean±SD
Milk production (kg)	130	7835 ± 631,33
Body Condition Score (skor)	130	3,25 ± 0,26
Lactation length (day)	130	346 ± 65,26
Dry period (day)	130	77 ± 33,18

Source: Processed Secondary Data, 2021

PT. UPBS's average milk production of lactating dairy cows is 7835 ± 631.33 kg, and classified as a high milk production category. The BCS factor, lactation length, and dry period have a significant effect ($P < 0.01$) on the milk production of dairy cows at PT. UPBS and its effect are equal to 76.2%, shown in Table 1. The results of the coefficient of determination (R^2) show that the BSC factor, lactation days, and dry period are tightly connected with milk production.

The BCS factor affects milk production with the relationship between the two variables because when the cow is lactating, it needs sufficient nutrients and energy for the daily needs to support milk production, especially in the early lactation period (first trimester). Dairy cows generally face insufficient nutritional requirements during this period due to poor feed intake that cannot support the energy required for milk production. This condition is known as negative energy balance [2;7]. A negative energy balance can reduce milk production and fertility in dairy cows [2;8].

The duration factor of the lactation in Table 1 affected milk production. In general, a productive dairy cows lactation period is about 305 days (10 months) with milk production increasing after the cows give birth. The duration of lactation should not be left too long, this is because once it reaches its peak, the ability to produce milk will automatically decrease [3]. The results of the average length of lactation at PT. UPBS is 346 ± 65.26 days with several factors that can affect the length of lactation could be the efficiency of livestock reproduction followed by environmental conditions. Delay in the process of pregnancy in dairy cows can affect the calving interval and lactation period. The calving interval process, lactation period, and pregnancy are inseparable phases with domino effect if one of the phases either delay or accelerate [9].

The dry period factor of the cow can be seen in table 1 and table 2 with significant effect on milk production. The regression results show that the increasing dry mass will not increase milk production. A longer dry period does not cause an increase in milk production [10]. The dry period requires dairy cows to rest the udder glands and increase body deposits resulting in next milk production being improved, while the alveolar glands in the mammary glands are recovering to be ready to produce milk on the next lactation [11]. Alveolus is a place to synthesize milk elements, so the new cells and maintained cells will affect the increase or decrease the synthesized milk elements [12].

4. Conclusion

Body condition score (BCS), lactation length, and dry period length have a major effect of 76.2% on the production of dairy cow's milk at PT. Ultra Peternakan Bandung Selatan. Full attention on BCS, lactation length, optimal dry period in dairy cow rearing are needed to optimize the milk production, according to the recommendations.

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