Effect of Steaming Up on Old Pregnant Parent Weights, Calf Birth Weight and Colostrum Production in PFH Cattle in Sumber Rejeki Group, Princi, Dau, Malang District

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Abstract

The study purpose to determine the relationship between steaming up on body weight of pregnant cow, birth weight of calf and colostrum production. The research was conducted in Sumber Rejeki Group at Princi, Dau, Malang District, East Java. The material used in this research was 30 cows. The research method used in this research was case study. The results showed that steaming up treatment did not give significant effects on body weight of pregnant cow and calf birth but it did give significant effects on colostrum production. The average weight of pregnant cow that treated with steaming up was 483.03±28.43 kg and the average weight that not treated with steaming up was 471.81±29.90 kg. The average calf birth weight that its mother treated with steaming up was 32.25±6.52 kg and the average calf birth weight that its mother not treated with steaming up was 31.70±4.96 kg. The average of colostrum production from cow that treated with steaming up was 10.91±3.38 liter/cow/day and the average of colostrum production from cow that not treated with steaming up was 7.94±1.79 liter/cow/day. It was concluded that steaming up treatment effects on body weight of pregnant cow and calf birth weight did not differ significantly (p-value>0.05) but it had significant effects on colostrum production (p-value<0.05). It was suggested to have steaming up treatment on pregnant cow 2 until 3 weeks or 15 days before partus in order to achieve optimum production and maximum profit.

Keywords : Body weight of pregnant cow, calf birth weight, colostrum production. steaming up

Introduction

Dairy cows are cows that are bred for milk because of their ability to produce large amounts of milk. The resulting milk production can supply most of the milk needs for people in the world compared to other dairy-producing livestock such as buffalo, sheep, goats, and camels (Surjowardojo et al., 2019). There are 2 dairy cattle breeds that are commonly bred in Indonesia, namely FH cattle and jersey cattle (Anonymous, 2019). Friesian Holstein (FH) dairy cattle are cattle breeds with the largest number of production compared to other cattle breeds (Christi and Tanuwiria, 2019). FH cattle were crossed with local cattle (Javanese or Madura cattle) named PFH cattle which inherited the trait of high body weight and were easy to adapt to tropical environments with relatively high milk production (Zainudin et al., 2014). Ako (2015) stated that the milk production of PFH cows reaches 4500-5000 liters per one lactation period (305 days).

Dairy cow's milk production during lactation is influenced by genetic, environmental and interaction factors. 70% milk production is influenced by environmental factors which are divided into 2, namely external and internal, such as feeding, climate and maintenance management are factors that affect the external environment while the internal environment includes biological aspects of lactating cows such as lactation period, lactation duration, dry period and empty period (Mahmud, et al., 2020). Milk production can be maintained from the beginning to the end of lactation. In one gestation period cows need time to rest which is called the dry period.

The dry period is a management carried out by farmers on lactating mother cows when the milk production produced by the mother cow has decreased or when the mother cow is pregnant at the age of 7 months. The length of the dry period affects milk production in dairy cows, ideally for 60-70 days before parturition (Harjanti et al., 2021). The dry period is a period to prepare for birth and recovery, the cow's body will become more ready and store nutrient reserves in the body for further milk production and to maintain the fetus in the womb (Tribudi et al., 2020). Dried dairy cows require good management and nutrition. Dairy cows that have entered a dry period should also not be milked to maintain their body condition.

Steaming up is an increase in feeding both qualitatively and quantitatively that is excessive in pregnant dairy cows in the dry period about 2 to 3 weeks before calving (Arfuso et al., 2017). The purpose of steaming up is to increase the production of dairy cows for the next lactation period. Steaming up allows the udder secretory cells to develop maximally during the final preparation before the start of the lactation period. Steaming up can control the nutrients consumed by livestock by increasing their levels such as feeding with high levels of CP and TDN. Steaming up can increase the live weight of pregnant dairy cows (Roche, 2016), and can have a positive effect on calf birth weight (Das et al., 2007) and can increase colostrum production in dairy cows (Kant and Yadav, 2016).

Sumber Rejeki Group Dairy Cattle is a dairy cattle group located in Princi, Dau, Malang District which is currently led by Mr. Puji Utomo. According to Mr. Puji Utomo, Sumber Rejeki Group was founded in 1987. Initially this group was a member of the Dau Village Unit Cooperative, after Village Unit Cooperative Dau closed the Sumber Rejeki Group turned into one of the business partners of PT. Nestle Indonesia in 2016. This group has become a business entity in the form of a CV (Commanditaire Vennootschap) in 2020. The population of dairy cattle in the Sumber Rejeki group is currently around 600 cows with a group consisting of 82 people. The daily milk production of the Sumber Rejeki group averages 2500 to 2600 liters per day which will then be sent to the PT. Nestle Indonesia in Kejayan District, Pasuruan Regency.

There have not been many studies examining the effect of steaming up treatment on the weight of older pregnant mothers, calf birth weight and colostrum production in PFH cows. So, based on the above study, a study was conducted to determine the effect of steaming up treatment on the weight of the pregnant parent, calf birth weight and colostrum production on PFH cows in the Sumber Rejeki Group.

Materials and Methods

Research Location and Time

The research was carried out in Malang Regency, precisely in the Sumber Rejeki Dairy Cattle Group, Princi Hamlet, RT 21 RW 03, Gadingkulon Village, Dau District, Malang Regency, East Java. The location was chosen because the Sumber Rejeki Dairy Cattle Group is one of the livestock groups with a fairly large population in Dau District, the total population of dairy cattle is around 600 heads. The time of the research was from March 1, 2022 to June 30, 2022.

Research Material

The material used in the Sumber Rejeki Livestock Group, Princi, Dau, collected data on 30 old pregnant PFH dairy cows that had entered the second and third lactation periods, newborn calves and colostrum produced by new mothers. According to Alwi (2012), a sample of 30 respondents is needed for correlation research. Discussing the problem of sample size, it can be put forward a theorem regarding a single or univariate variable, namely the Central Limit Theorem, the Central Limit Theorem is a statement where a sample distribution of the Mean value will form a Normal Distribution if the sample size is larger, but in practice the Limit Theorem Central has been applicable for a sample size of at least 30.

Research methods

The method used in this research is a case study. The dairy cow samples observed in this study were measured for chest circumference, then the results of the chest circumference measurement were calculated using the Schoorl formula to estimate the body weight of the old pregnant mother who was about to give birth, the birth weight of the calf and the production of colostrum. Data obtained from direct observation and interviews with farmers.

Research variable

The variables observed in this study were:

1. Old Parent Body Weight
   Measurement of body weight of pregnant parents was carried out using the Schoorl formula, namely measuring chest circumference with a measuring tape (Sudono, et al., 2004). Measurements were made at the age of pregnancy entering the age of 9 months.
2. Calf Birth Weight
   Weighing the calf's birth weight by placing the sack right under the calf's body which has been given a rope to attach to a hanging scale and then lifting it with a supporting iron rod.
3. Colostrum Production
   Measurement of colostrum milk was measured using a measuring container every morning and evening from the first cow calving until 5 days after.

Results and Discussion

Overview of Research Sites

The research area is located in Princi, Dau, Malang District. At the beginning of the study, the Sumber Fortune Group had a population of 500 dairy cows, which over time the dairy cattle population in the Sumber Fortune Group increased to 600 at the end of the study. Geographically, Princi which is located in Gadingkulon Village is located on the highest plateau than other hamlets, namely Kranjan Hamlet and Sempu . Princi is located on the slopes of the foot of Mount Kawi in the north and the slopes of Mount Panderman in the south, which has a topography of plains and mostly hills with an altitude of ± 670 meters above sea level and has an average temperature ranging from 20-27℃ with rainfall The average rainfall reaches 2400 mm/year. The distance from Princi to the capital of Dau is ± 5.5 km which can be reached in about 20 minutes.

The dairy cattle breeds owned by the breeders in the Sumber Rejeki Group Princi are PFH and FH cattle breeds which have a characteristic black coat color with white stripes with the lower part of the chest, lower abdomen and legs being white and having small and short horns that point towards the bottom. front (Surjowardojo et al., 2019). Milk production in the Sumber Rejeki Group normally ranges from an average of 2500-2600 liters/day, depending on the number of cows entering the lactation period. When many dairy cows enter the dry period, the daily milk production of Sumber Rejeki Princi group decreases to 2300-2400 liters/day.

Feeding Management

The management of feeding carried out by farmers in the Sumber Rejeki group is that dairy cows are fed 2 times in the morning and in the afternoon every day. The forage provided by breeders is odot grass (*Pennicetum purpureum cv. Mott*). The nutritional content of odot grass is DM 16.59%, OM 82.81%, CP 12.72%, CF 32.35% and CFt 2.28% (Wati et al., 2018). According to Rahayu et al. (2021) odot grass is one of the superior grasses because it has high production potential with high digestibility and is easy to cultivate. During the corn harvest in Princi, the farmers will combine the forage provided with corn stalks, this is done by the farmers as an effort to use all available resources efficiently. Forage given to livestock reaches 14 kg to 15 kg per meal per day. Breeders do not measure exactly forage feeding. Some breeders in the Sumber Rejeki Group also chop grass using a chopper before giving it to livestock with the aim of getting smaller pieces of grass so that it is easier for livestock to digest.

Farmers in this group also add concentrate feed to dairy cattle with the aim of increasing milk production. Concentrated feed given to livestock is Mix Feed brand BAR-A18 or Mix Feed BAR-A20 purchased from PT. Nestle Indonesia. Concentrated feed for livestock reaches 2 kg to 3 kg once a day. Farmers in the Sumber Rejeki Group also did not measure the feed concentrate with certainty. Concentrated feed is given using a plate or dipper as a measuring tool, where each plate is equal to 0.5 kg and each dipper is equal to 1.5 kg.

Dry Period

The dry period is carried out by farmers in the Sumber Rejeki Group when they are 7 months pregnant with the aim of preparing the dairy cow to have a strong and healthy

body at the time of calving. This is in accordance with Harjanti et al. (2021) which states that the dry period is the length of time for cows to stop milking until the cows will show calving again. The dry period in dairy cows is carried out at 60-70 days before parturition or around 7 months of gestation. The dry period aims to rest the udder for the mother who will give birth again so that the body condition is stronger and healthier and restores the weight of the mother lost during the lactation period.

Breeders in the Sumber Rejeki Group dry their dairy cows using physiological and mechanical methods. The physiological method used is the regulation of feeding with the sudden cessation of concentrate administration and the mechanical method used by farmers in this group is intermittent milking. Intermittent milking is done on the first day in the morning, then the next day in the afternoon as well as on the following days. During intermittent milking, the concentrate is also stopped. This is in accordance with the statement of Sudono et al. (2004) that the arrangement of the dry cage system can be done in 2 ways, namely physiologically and mechanically. Physiologically it is done by regulating feeding while mechanically it consists of intermittent milking, incomplete milking and sudden cessation of milking. The drying stage of dairy cows can be done in several ways, including intermittent milking, incomplete milking, stopping concentrate administration suddenly arrive and milking intermittently simultaneously.

Steaming Up

Farmers in the Sumber Rejeki Group who gave steaming up treatment to older pregnant cows on average carried out this treatment when they had entered 20 days before parturition, but some farmers did steaming up treatment 1 week before parturition, according to Arfuso et al. (2017) steaming up is a treatment for excessive feeding both in quantity and quality of the feed 2 – 3 weeks or 15 days before parturition. There are not many breeders in the Sumber Rejeki group who carry out steaming up treatment because farmers assess that if they do steaming, the calves that are born will have a larger body so they are afraid that during parturition they will experience birth disorders (dystocia). According to Kant and Yadav (2016) there are many different views in the available literature with the aim of ensuring the optimal level of steaming up that can provide the desired cow body condition before calving. Evaluation of the steaming up treatment needs to be carried out on colostrum production, milk production and post-calving production performance such as calf birth weight, birth disorders and days open or the time gap between females after giving birth to becoming pregnant again. In addition, economic factors are also one of the reasons why farmers do not steam up.

Farmers who do not carry out steaming up only give concentrate feed as much as 4-5 plates or 1.5 jars which is equivalent to 2 kg of concentrate feed at a time or 4 kg/day and only enough forage is given to adjust the daily needs of livestock as much as 30 kg/day. day. Breeders in the Sumber Rejeki Group who carry out steaming treatment expect an increase in milk production. The steaming up treatment carried out by farmers in this group is to provide 8 kg/day or 4 kg of concentrate feed at each meal. Kant and Yadav (2016) stated that cows were given steaming treatment by giving 4 kg of concentrate feed and 5 kg of wheat straw for each meal. Feeding forage to cows treated with steaming up an average of 35 kg/day.

Effect of Steaming Up on Body Weight of Old Pregnant Parent, Calf Birth Weight and Colostrum Production

The results of the unpaired t-test analysis on the weight of the old pregnant mother, the birth weight of the calves and the production of colostrum are shown in Table 1.

Table 1. Unpaired t-test results on Parental Weight of Old Pregnant Parent, Calf Birth Weight and Colostrum Production.

Variable	t Count	df	t Table	*p value*
Weight of Old Pregnant Parent	1.04	28	2.05	0.31
Calf Birth Weight	0.26	28	2.05	0.80
Colostrum Production	2.88	17	2.11	0.01

Note: df = degree of freedom

The Effect of Steaming Up on the Weight of Old Pregnant Parent

Based on the results of the unpaired t test analysis, it can be concluded that there is no significant difference between the cows treated with steaming up and the cows without steaming treatment carried out by the Sumber Rejeki group on the weight of pregnant cows (t count < t table). Parent body weight is influenced by many factors such as genetics, nutritional content of the feed provided and management (Nurfitriani et al., 2021). Roche (2016) stated that the steaming treatment can increase the live weight of pregnant cows up to 0.7 kg and can increase milk production by 10-15% during the first 8 weeks of lactation. Mäntysaari and Mäntysaari (2015) state that body weight lost at the beginning of lactation will return at the end of lactation accompanied by an increase in feed intake given during the dry period.

Effect of Steaming Up on Calf Birth Weight

Based on the results of this t-test analysis, it can be concluded that there is no significant difference in the birth weight of calves in which the cows were treated with steaming up and the cows without steaming were carried out by the Sumber Rejeki Dusun Princi group. The same thing was also stated in Kurniawan (2008) study. Statistical analysis of calf birth weight in broodstock treated with steaming up with a PK level of 16% and a PK level of 14% did not show any difference. The low and high birth weight of the calf is influenced by 2 factors, namely genetic factors and non-genetic factors. The genetic factor means that it has a close relationship with the parent's genetics, the better the genetic condition of the parent, the better the condition of the calf later and vice versa if the parent has a bad genetic condition, it will give a bad genetic condition to the calf. Non-genetic factors including age, feed provided and good management will also give a good calf birth weight (Muslim et al., 2013 and Amam and Harsita, 2019).

Effect of Steaming Up on Colostrum Production

Based on the results of this t-test analysis, it can be concluded that there is a significant difference in colostrum production from cows treated with steaming up with cows without steaming treatment carried out by the Sumber Rejeki Dusun Princi group. This is in accordance with Kant and Yadav (2016) which stated that cows that were treated with steaming up by giving 4 kg of concentrate feed at each meal had a better effect on colostrum production and milk production compared to cows that were not treated with steaming up. Factors that affect colostrum production vary widely, including the length of the dry period, the sex of the calf, the duration of previous lactation and milk production during the previous lactation period. The high production of colostrum allows for a good reserve of nutrients in the body in dairy cows. The increasing age of dairy cows that have passed the age of peak production, there will be a decrease in the number of secretory cells along with ductus and lumen tissue so that it can affect the production of colostrum produced (Surjowardojo et al., 2021).

Conclusion

The results of this study can be concluded that the steaming up treatment carried out by farmers in the Sumber Rejeki group gave a significant positive effect on colostrum production, but did not have a significant effect on the weight of the old pregnant mother and the birth weight of the calf.

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