

Litter Size Number Effects on Colostrum Quality of Etawa Crossbred Goat

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Abstract— The quality of colostrum of Etawa crossbred goats was studied to establish the transition period and the time when milk can be marketed. Thirty-seven (37) dairy goats were used: 18 single birth and 19 twins births. Samples were collected at 0(zero) hours postpartum. Does were milked immediately after kidding and kids should be given colostrum immediately. The aims of this study to determine the quality of colostrum in terms of fat and lactose content. Data were analyzed using multiple linear regression. Result showed that the highest levels of fat colostrum and lactose colostrum content were found in twins births (fat 5.05 %; lactose 8.34%), and the lowest in single birth (fat 8.89%; lactose 3.82 %). In conclusion that the fat and lactose content of colostrum in twins births were higher than single birth. The regression analysis of fat and lactose of colostrum not significant ($P < 0.05$), but litter size has a positive correlation to the fat and lactose levels of colostrum.

Keywords— Colostrum, Litter size, Etawa Crossbred Goat, Fat, Lactose.

I. INTRODUCTION

Colostrum was the first nutrient for the kid newborn, because it contains the energy, vitamins and antibodies are needed at the beginning of their life. Goats get their energy from fat and lactose. Apart from providing immunity, colostrum was very important to provide energy for neonates for thermoregulation (Yilmaz and Kasikci, 2013). Lactose was one of the energy sources found in colostrum. Colostrum contains a potent mixture of various components, some of which such as fat, protein, lactose and minerals are very important in nutrition (Ontsouka et al. 2003).

The longer the initial time of giving colostrum, the less energy content was absorbed by the goat, while the quality of colostrum will decrease over time. Susilorini Trisunuwati and Zulfa (2017) found that calves given colostrum 15 minutes and 30 minutes after birth gave a better appearance than calves given colostrum 45 minutes after birth. This study aims to determine the quality of Etawa Crossbred colostrum in terms of fat and lactose in various litter sizes.

II. MATERIALS AND METHODS

Data and Management

The data set used in this study consisted of 37 gestation ewes based on litter size that 18 single and 19 ewes' twins, analyzed in this study were collected from UPT PT and HMT Singosari, Malang. Colostrum samples were taken before suckling on 0 hours after partus and 24 hours the next day. Colostrum of the ewes was taken to be analyzed for fat and lactose content and analyzed by using LactoScan.

III. METHOD

The method used was case study and direct observation at UPT PT and HMT Singosari. Data selected based on litter size determined by purposive sampling, namely by taking the main Data analysis uses Multiple Linear Regression with the following formula:

Multiple linear regression analysis with two variables (Steel et al., 1993)

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \epsilon$$

Form of suspicion:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2$$

Information:

Y: dependent variable (litter size)

β_0 : Intercept

β_1, β_2 : Regression coefficient

x_1 : Free variable (fat)

x_2 : Free variable (lactose)

The coefficient of determination

$$R^2 = \frac{JK \text{ Regresi}}{JK \text{ Total}}$$

Correlation Analysis

$$r_{xy} = \frac{\sqrt{JK \text{ Regresi}}}{JK \text{ Total}}$$

IV. RESULTS AND DISCUSSION

The results of the research of Etawa crossbred's colostrum quality in terms of fat and lactose content on litter sizes were:

TABLE 1. Quality fat and lactose colostrum based on the Litter size.

Litter size	Lemak (%)	Laktosa (%)
1	3.82 ± 2.00	8.34 ± 2.89
2	5.05 ± 2.41	8.89 ± 2.43

Information: 18 single birth and 19 twins births) there is no significant effect ($P < 0.05$)

The results showed that fat and lactose levels have been presented in the table above. Overall, the quality of fat and lactose content in colostrum of etawa crossbred ewes pregnant and giving birth to twins was higher than that of ewes who gave birth singles on litter size. According to Hikagi (2013), IgG concentrations are higher in females with multiple births, this indicates an increase in immunoglobulin transport in the mother's blood serum to colostrum, this is a signal that occurs in the fetus to its mother to produce immunoglobulins that are available for multiple births of twins. This was not occurred to quality of fat and lactose content in colostrum.

The results showed that there was a low relationship between litter size with levels of fat and lactose in colostrum of etawa crossbred ewes ($p < 0.05$) with a correlation coefficient of 0.07. Previous research, Hikagi et al., (2013) found that the fat content of Awassi goat colostrum at singles birth was 10.0 ± 5.1 % and litter size twins was 9.0 ± 4.1 % and lactose single litter size 3.2 ± 0.8 %, and twins 3.5 ± 0.5 %. The results were showed that fat content was lower on singles litter size was 3.82 ± 2 % twins was 5.05 ± 2.4 . As for the lactose content obtained higher on single litter size was $8.34 \pm 2.89\%$ and twins 8.89 ± 2.43 %.

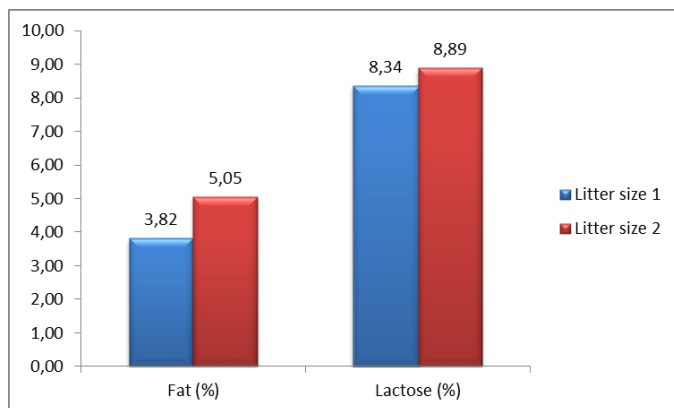


Fig. 1. Fat and lactose content of etawa crossbred ewes at different parities

Susanti (2019) reported that fat content contained in the colostrum of the etawa’s crossbred ewe came from acetic acid which was absorbed in the rumen, acetic acid was a precursor to milk fat, the higher the concentration of acetic acid, the higher the fat content of milk. Colostral fat concentrations in the Ewes carrying twin lambs may be due to Increased body fat mobilization under a strong negative energy balance. Ewes carrying twin fetuses require approximately 1.4 times more energy for fetal development than women carrying a single fetus (Ruset, 1985). Prihatminingsih (2015) showed that the amount of feed protein consumed by lewes. Protein on feed can form glucose through the process of gluconeogenesis where the main source of glucose was a precursor to lactose. The higher the consumption of crude protein, the higher the milk production,

protein content and milk lactose produced by etawa’s crossbred ewe.

V. CONCLUSION

Ewes who pregnant and give twins birth have higher levels of fat and lactose than ewes who give single birth because the energy requirements required by the number of twins trigger the ewes to convert the incoming feed energy into colostrum components to be prepared for labor. Even though no affect the levels of fat and lactose colostrum was significant but litter size have a positive correlation to the levels of fat and lactose colostrum.

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