International Journal of Engineering & Technology, 7 (2.29) (2018) 457-459

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research paper

Feed Composition Analysis and Reproductive Status of Dairy Cows Raised in Yogyakart

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Abstract

The objective of this study was to determine the content of the feed given and reproductive status of each animal and its effect on reproduction performance in early lactation dairy cows. Seven early lactation of Friesian Holstein cows were used from local farmer. The observed variable were feedstuff from local farmer and reproductive status (post partum estrous and service per conception). The results of proximat and van soest analysis from feedstuff consist of elephant grass (Pennisetum purpureum) and concentrate feed from feed mill. The elephant grass (Pennisetum purpureum) was contained of dry matter (DM) 86.27%, Ash 18.63%, extract eter (EE) 3.84%, crude fiber (CF) 30.62%, crude protein (CP) 13.05%, neutral detergent fibre (NDF) 73.73% and acid detergent fiber (ADF) 45.31%. Concentrates feed was contained of dry matter (DM) 89.24%, Ash 15.36%, extract eter (EE) 5.37%, crude fiber (CF) 17.11%, crude protein (CP) 12.76%, neutral detergent fibre (NDF) 58.23% and acid detergent fiber (ADF) 19.20%. The results of reproductive parameters for post partum estrous (PPE) 121.43±16.672 days and service per conception (S/C) was 2.14±0.690. In conclusion the feedstuff were given less meet the requirement, and affecting the performance of reproduction.

Keywords: *Friesian Holstein dairy cow; elephant grass; van soest, post partum estrous; service per conception*

1. Introduction

A high profit per unit of time is the goal of every business, including in the dairy cattle business. The amount of profit is determined by the magnitude of the positive difference between the value of revenue and expenses. In the dairy business, milk sales are the largest source of income for farmers, while the cost of feed is the largest cost element to be spent. The main produce of dairy cows are milk, calve and by product. There is a critical period on dairy cows performance especially for those with high milk production. It happens in the first lactation period, which is the first quarter of lactation. It is also called the first three semesters (month) of lactation. Dairy feed primarily for cows that are producing milk, consisting of a number of forages and concentrates. These forages and concentrates should be given in a certain balance in order for high milk production and quality to be achieved. As is known, most of the milk produced dairy farmers are channeled to the Milk Processing Industry (MPI) through cooperatives institution. MPI in the milk shelter, imposing a minimum quality standard on the milk it collects. Thus in addition to high milk production, the quality of milk produced should also be considered in the feeding management.

To achieve high milk production while maintaining milk fat content within the limits that meet the quality requirements, the ratio between dry and forage materials with concentrate is 60:40. However, if the forages given are of low quality, the ratio between dry and forage materials with concentrate may shift to 55:45. Whereas if forage given is of medium to high quality, the ratio of dry matter to concentrate may change to 64: 36 (1). High-yielding lactation dairy cow, require adequate nutrition both quantity and quality. The efficiency of nutrient use for milk production depends mainly on the amount of milk production. The higher the level of milk production, the proportion of nutrients used for basic living will be lower. A cow producing 12 kg/day will use about 50% of the nutrients consumed for production. If milk production increases to 22 kg/day, that number will increase to 66 (2). Some information suggests that this high-yielded lactation cow will show a more obvious response to improved maintenance management. The results of Whitemore et al. (3) showed that dairy cows that are genetically highly capable of production tend to have low reproductive performance.

2. Literature Review

Dairy cow that exist in indonesia was Friesian Holstein grade cows. Friesian Holstein cow occupy the largest population, almost all over the world, in both subtropical and tropical countries. This cow is easy to adapt in a new place. In Indonesia Friesian Holstein population is also the largest among other dairy breed (4). The production of dairy cow by Hertika(5) is about 14.99 litre/day and Putranto (6) the average production of dairy cow in Indonesia is about 10 litre/day. Dairy cows require a number of nutrients to meet the needs of various body functions. Basically, the need for dairy cows consists of basic needs and the need to produce. The necessity of basic living is the need to fulfill the processes of life alone without the process of growth, milk production, and for the growth of the fetus when the dairy cows are pregnant (4). The need for ruminants to feed is reflected by the need to nutrition. The amount of nutritional needs each day is highly dependent of livestock, age, phase (growth, adulthood, pregnancy, and lacta-

tion). Body condition and the environment (temperature, Humidity), and body weight (7).
Feed dairy cows are the main factors that can affect production and quality of milk, and can affect cow health, good body health and reproductive health. In general, feed is forage (grass) and concentrate as supplementation feed. Although thus, the feeding should be in accordance with the body weight of the cow, the fat content milk and milk production. Cattle feed given to livestock should meet some requirements, namely: ingredients used should be easy obtained, available continuously or throughout the year, the price is relatively cheap, it is not contains toxins, does not compete with human needs and has nutritional value (8).

3. Methodology/Materials

3.1. Experimental animals, location and period of research

The experiment was conducted on local dairy farm in Yogyakarta, Indonesia. Analysis of feed samples was conducted in Forage and Pasture Science Laboratory, Faculty of Animal Science Universitas Gadjah Mada. The study was carried out during 2 months of lactation starting from February to April 2016.

3.2. Data and sample collection

Feedstuff sample was taken morning for each animal. The sample of feedstuff was transported to the laboratory with vaccum plastic bag. Data collection was performed by jotting reproduction performance on each friesian holstein dairy cows. Reproduction performance includes postpartum estrous and service per conception were collected. Postpartum estrous refers to the time from when a cow calves until the first time its estrous. Service per conception refers to the average number of time the cow mates to that cow were pregnant.

3.3. Proximat and Van Soest analysis

For determining the chemical composition of feed ingredients, feedstuff treated as shown in Fig 1.

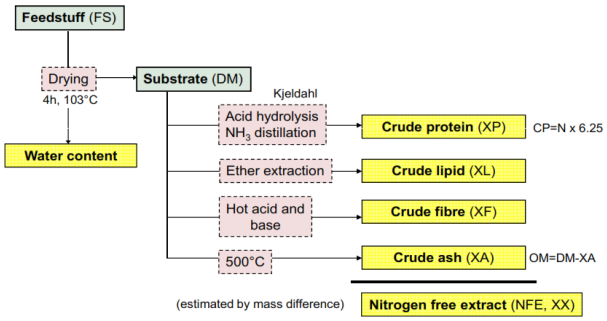

Fig. 1 Proximat Analysis

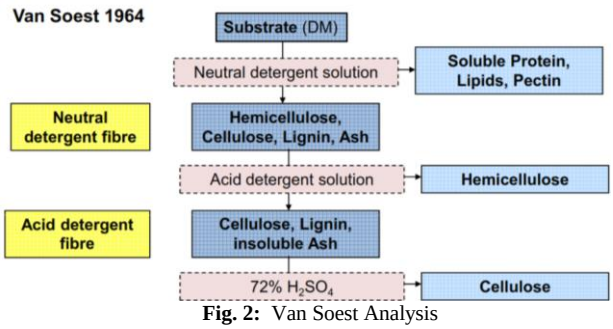

Fig. 2: Van Soest Analysis

3.4. Statistical analysis

The data obtained from reproductive parameters were observed include the post partum estrous (PPE) and service per conception (S/C) analyzed descriptively using IBM SPSS program version 24.

4. Results and findings

4.1. Chemical composition of feed ingredients

Results of proximat and van soest analysis from feedstuff consist of elephant grass (Pennisetum purpureum) and concentrate feed from feed mill.

Table 1: Ingredients and nutrient compositions concentrate formulation of feed

Feedstuff	Results (in Dry Matter)						
	DM	Ash	EE	CF	CP	NDF	ADF
Forage	86.27	18.63	3.84	30.62	13.05	73.73	45.31
Concentrate	89.24	15.36	5.37	17.11	12.76	58.23	19.20

The elephant grass (Pennisetum purpureum) was contain dry matter (DM) 86.27%, Ash 18.63%, extract eter (EE) 3.84%, crude fiber (CF) 30.62%, crude protein (CP) 13.05%, neutral detergent fiber (NDF) 73.73% and acid detergent fiber (ADF) 45.31%. Concentrates feed was contain dry matter (DM) 89.24%, Ash 15.36%, extract eter (EE) 5.37%, crude fiber (CF) 17.11%, crude protein (CP) 12.76%, neutral detergent fibre (NDF) 58.23% and acid detergent fiber (ADF) 19.20%. Hartadi et al, (1993) reported nutritional content contained in elephant grass was DM 86%, Ash 11.5%, EE 1.7%, CF 33.4%, and CP 4.7%. The results do not vary much with the results of Hartadi et al. The nutrient content of a plant is affected by soil fertility, climate, plant species and management. Genetic factors differ by forage and environmental factors influenced by soil and climate. Meanwhile, according Reksohadiprojo (1985) that production and quality of grass influenced by temperature and rainfall.
The concentrate was contain DM 89.24%, Ash 15.36%, EE 5.37%, CF 17.11% and CP 12.76%. The results does not vary much with results Laryska and Nurhajati (2013), The nutrient content of commercial concentrate feed contains CP 30.4%, EE13.5%, CF13.4%, Ash 10%, Calcium 2.7% and DM 91.3%. Feeding concentrates that have higher nutritional value than forage, is intended to provide opportunities for livestock in order to maximize growth / production. The good concentrate according to Siregar (1995) is with processed, semi-finished or raw material with a crude protein content at least 18% and Total Digestible Nutrient (TDN) or digested feed of not less than 75%.

4.2. Reproductive Status of Dairy Cows

The results obtained from the average post partum estrus (PPE) is 121.43 days with standart deviation 16.672. Salisbury and Vandemark(9) opinion that first mating is the best performed within 60-90 days after parturition cows. The lower of post partum mating(PPM) value, it will be more efficient the reproduction performance of dairy cows. The difference in PPM on each cow is caused by differences in the occurrence of estrous as the result of milk production difference which will cause weight loss.
The average from the service per conception (S/C) is 2.14 with standart deviation 0.690. Service per conception is a comparison of how many times the treatment of mating until pregnancy. The value of S/C is strongly influenced by human factor especially in the process of artificial mating (artificial insemination). Jainudeen and Hafez (2008) which states that the normal S/C value is 1.6 until 2.0.

5. Conclusion

Feed is an important factor in a livestock management. Without good feed and in sufficient quantities then although the livestock

is a superior breed will be less able to demonstrate its superiority. Completion of nutrients in ruminant livestock feed will be able to accelerate the first estrus after birth, keeping pregnancy and maintaining condition during lactation.

Acknowledgement

The author wish to express thanks to the Ministry of Research and Technology which has provided funding research is conducted through the PMDSU Research Fund.

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