

THE UTILISATION OF PROBIOTICS BIOPLUS; *Saccharomyces Cerevisiae* And *Candida Utilis* TO IMPROVE DAIRY CATTLE PRODUCTIVITY

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ABSTRACT

Lack of good quality feed during the year resulting in low milk production and long calving interval in dairy cattle. Technology to improve the utilisation of low quality feed by the animals is required. The technology should be cheap and easy to be adopted by the farmers. Probiotic Bioplus combined with *Saccharomyces cerevisiae* and *Candida utilis* had been proven increased feed efficiency of low quality feed and high concentrate diet (> 50 % of total dry matter) then improve beef cattle's productivity. Thus a study to improve dairy cattle productivity by using the combination of the three probiotics was undertaken. The study was conducted at dairy cattle farm in Jakarta Timur by using 30 dairy cattle in similar production status. They were divided into two groups of treatment, namely Control Group fed by basal diet consisted of field grass, concentrate and "tofu waste" and Treatment group fed basal diet plus the three probiotics. The measurements were undertaken on feed intake, milk production, milk fat content, feed conversion ratio and calving interval. The results showed that milk production was increased by 9 % from 8.5 L/day in Control Group to 9.3 L/day in Treatment group ($P < 0.05$). Milk fat content increased from 4.02 % in Control group to 4.19 % in Treatment group ($P > 0.05$). Feed conversion ratio reduced from 1.4 to 1.0 kg DM/L milk produced ($P < 0.05$). Control group has longer calving interval (495 days) compared to 382 days in Treatment group ($P < 0.05$). The conclusion of the study is that the introduction of the three probiotics to dairy cattle increased milk production, milk fat content, feed conversion ratio and reduced calving interval period.

Keywords : Winugroho, Widiawati, Probiotics, Bioplus, Sacharomyces cerevisiae, Candida Utilis, dairy cattle

INTRODUCTION

Good quality feeds and continuous supply during a year are the main factors for the animals to have optimum productivity. However, lack of good quality feeds has become a national problem facing by most of smallholder farmer in Indonesia causes low productivity of dairy cattle. The animals have low milk production both quality and quantity and long calving interval period.

After partus, most of dairy cattle are loss in their weight. When the feeds available are low in quality, the loss weight is getting worst and milk production decreases, particularly during the first two to three months of their lactation period. During this time, the animals required more nutrients both for milk production and

recovery of their body after partus. When the animals lost their weight, they wont reach an ideal body weight required for oestrus and pregnant as reported by Winugroho dan Teleni (1993) that animals required a certain weight as ideal weight where the animals can have oestrus and pregnant.

Supply of good quality feeds during a year is become a difficult work and requires high cost. Thus this technique is hardly to be adopted by smallholder farmers. A simple and cheap technique to improve the utilisation of low quality feeds by the animal is required. This technique should be easy adopted by smallholder farmers and can improve animal's productivity.

Probiotic Bioplus combined by khamir *Saccharomyces cerevisiae* and *Candida utilis* has become a good choice. Beef cattle's productivity improvements due to the introduction of these probiotic have been reported by some researcher (Winugroho *et al.*, 1993, 1995, 1997; Santoso, *et al.*, 1995; Haryanto, *et al.*, 1997; Ratnaningsih, 2000; Heni, 2000). Thus introduction of these three probiotics in dairy cattle was undertaken in order to increase milk production both quality and quantity as well as improve body condition of the cows to reduce the calving interval period.

MATERIALS AND METHODS

The experiment used 30 FH dairy cattle in the similar status of reproduction, namely Lactation I and Lactation II and in 8 months of pregnancy. The animals were divided into two equal groups of treatment, which were evenly matched for Lactation status. Each group of animals was allocated at random to one of the dietary treatment, namely Control group fed by fresh field grass 13 kg, Concentrate 5 kg and tofu waste 20 kg, While Treatment group was fed by the same kind and amount of feeds and introduced by probiotic Bioplus which was offered once in the first month of experiment (single dose = 400 grams) and *S. cerevisiae* and *C. utilis* which were offered every day (14 grams each). The feed for each animal was divided into two equal portions, one of which was offered at 0800 h and the other at 1600 h. The animals were allowed to adapt to the experiment diets for 14 days before the measurements were undertaken.

The measurements were undertaken on dry matter intake, milk production, milk fat content, feed efficiency and calving interval. Milk production and feed intake was measured every day for two months after partus, while milk fat content was measured twice a week during a two months after partus. Calving interval was observed by record two periods of partus.

All the data collected were tabulated by excel then statistical analysed by anova test (Steel and Torrie, 1980) by using SPSS program. Introduction of probiotik Bioplus and khamir *S. cerevisiae* and *C. utilis* has no significant effect on DM intake. Although the animals in Control group fed more (10.5 kg/day) than the animals in Treatment group (9.6 kg/day), but it not different significantly. However, the treatment increased significantly milk production from 8.5 L/day to 9.3 L/day. Milk fat content was also increased by 0.17 % from 4.02 % in animals in Control Group to 4.19 % in animals in Treatment group, although the increasing is not different significant.

RESULTS AND DISCUSSION

The effect of introduction of Probiotics on milk production

Data on dry matter intake, milk production feed conversion ratio and milk fat content of FH cattle during the observation period are presented in Tabel 1. Introduction the probiotics also improved feed utilisation by the animals as showed in the amount of DM consumed required to produce one litre of milk (FCR). In Treatment group, the animals required less DM intake (1.0 kg) to produce each litre of milk compared to the animals in Control group, which required about 1.4 kg DM intake for each litre of milk ($P < 0.05$).

The data indicated that introduction of the three probiotics improved low quality feed digestibility and absorption in the rumen then utilised by the animals for their production. These results were similar with the report of Wallace, (1994) that introduction of *S. cerevisiae* (10 g/head/day) increased the utilisation of fiber by the animals thus increased their productivity. While Plate, *et al.*, (1994) reported that DM digestibility was increased when the dairy cattle fed by wheat straw supplemented by *S. cerevisiae*. Study conducted by Winugroho *et al.*, (1993 ; 1995; 1997 ; 2000 ; 2001) showed that probiotics Bioplus which was combined with *S. cerevisiae* and *C. utilis* increased feed utilisation by the animals thus increase average daily gain of cattle.

The effect of introduction of probiotics on calving interval

Data on calving interval of the cattle is presented in Figure 1. The data showed that animals in treatment group have significantly shorter calving interval (382 days) compared to the animals in control group (495 days). Since the three probiotics improved low quality feeds utilisation by the animals (Tabel 1) thus it also improved body condition of the cows to the body score which required to have an oestrus and pregnant. Although the animals in two groups of treatment received similar amount of feeds, introduction of probiotics can improve the feeds utilisation by the animals thus increased their score body condition required to oestrus and pregnant.

According to Quinn (1980), ideal calving interval for FH cattle is 12 months of 355 days including 10 months of lactation period and 2 months of dry period. The result of this experiment shows that animals in Control group have calving intervals 140 days longer than the ideal days, while the animals in Treatment group have only 27 days longer than the ideal days for FH cattle. Therefore the introduction of the three probiotics improved the reproduction status of the FH cows kept in Indonesia.

Tabel 1. Means value of dry matter intake, milk production, feed conversion ratio, milk fat content of FH cattle in Control group and Treatment group.

| No. | Measurements | Control Group | Treatment Group | Significance |
|-----|-----------------------|--------------------------|--------------------------|--------------|
| 1 | Dry matter intake | 10.5 kg/day ^a | 9.6 kg/day ^a | 0.073 |
| 2 | Milk production | 8.5 L/day ^a | 9.3 L/day ^b | 0.035 |
| 3 | Feed conversion ratio | 1.4 kg DM/L ^a | 1.0 kg DM/L ^b | 0.035 |
| 4 | Milk fat content | 4.02 % ^a | 4.19 % ^a | 0.067 |

Note: Within rows, mean values with different superscript differ significantly ($P < 0.05$)

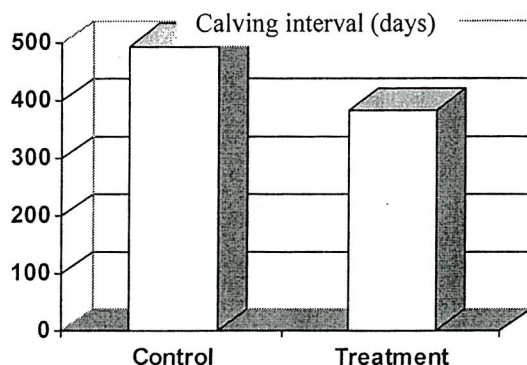


Figure 1. Means of calving interval of the animals in Control group (495 days) and treatment group (382 days) ($P < 0.05$)

CONCLUSION

It may be concluded from the results of the study that introduction of probiotic Bioplus, *S. cerevisiae* and *C. utilis* to FH dairy cattle increased milk production from 8.5 L/day to 9.3 L/day, and milk fat content from 4.02 % to 4.19 %, improved feed efficiency from 1.4 kg DM/L to 1.0 kg DM/L, and decrease calving interval from 495 days to 382 days.

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