

Feeding calf starter after birth can promote calf performance for increasing quality of cow replacement stock

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Abstract. Newborn calve has an undeveloped rumen and tend to easily diarrhea caused by *E. coli* from environment and cause death. Feeding calf starter (CS) content probiotic after birth can promote rumen development and suppress *E. coli*. This experiment aimed to evaluate the effect of different feeding calf starter to FH calf performance. Different test (t-test) was used in this experiment. The treatments were the use of different calf starter: 1. Calf starter from farmer (CS-F), 2. Calf starter content fermented waste cabbage (CS-L). The materials were CS content waste cabbage fermented, CS from farmer and 30 Frisian Holstein calves with aged 7-14 days and 41.14 ± 3.28 kg initial body weight. Feeding calf starter twice per day after giving milk, forage and water given *ad libitum*. The parameters measured were feed intake, feces consistency and daily gain. The data were analyzed with t- test. The result indicated that there were no different ($P>0.05$) on feed intake and average daily gain, but CS content fermented waste cabbage produced feces consistency better than ($P<0.05$) CS from farmer. Feeding calf starter with added fermented waste cabbage produce good calve performance.

Key words: calf starter, fermented cabbage waste, feed intake, feces consistency and body weight gain

1. Introduction

Rumen is the main stomach for ruminants that develop optimally at the age of 2-6 weeks depend on feeding as soon as after birth. Solid feed consisting of calf starter (CS) and fiber sources can be given to calves starting at 1 week can accelerate rumen development [1]. According to [2], the nutritional requirements for calves after birth to weaning are sourced from 40% of solid feed and 60% of milk. Calf starter that added molasses as much as 5% given to FH calves with aged 2-6 week can accelerate the development of rumen [3]. One indicator of rumen development is the presence of microbes which ferment feed in the rumen, because at the time of birth the rumen is sterile [1]. The rumen microbes come from the environment both from feed and milk given during maintenance after birth. The most dominant microbes in the rumen are bacteria. One way that can be done to accelerate the development of rumen microbes is to provide feed added source of lactic acid bacteria.

Lactic acid bacteria can affect the pH of the rumen, by accelerating the growth of Lactate-utilizing bacteria in the rumen [4]. Lactate-utilizing bacteria can reduce the production of lactic acid accumulated in the rumen, so that the rumen stability can be achieved. According to [5], fermentation in the rumen requires a pH with a range of 5-6. The more the number of rumen microbes increases with age, the greater the feed entering the rumen that is fermented by microbes produces volatile fatty acid (VFA). Furthermore, the VFA is absorbed by the rumen papillae into the blood as a precursor for meat formation. This is indicated by increasing body weight. Besides that, lactic acid bacteria as probiotic bacteria are beneficial bacteria that can suppress populations of harmful bacteria in the digestive tract, especially gram negative bacteria (*Echericea coli*) that can cause diarrhea. Therefore, it can be used as an alternative to natural ingredients as a substitute for antibiotics.

Cabbage waste is the result of the sorted outer leaves of cabbage. It naturally contains lactic acid bacteria and the fermentation process can increase the amount and potential as a source of probiotics. Extra fermented waste cabbage on a pelleted calf starter as much as 6%, produced lactic acid bacteria 0.8×10^7 cfu/g [6]. Then, the results of research by [6] showed that the addition of 6% fermented cabbage waste to starter feeds given to calves aged 7 - 42 days resulted in good calf performance.

Based on this, the experiments have been conducted to compare different starter feeds, namely calf starter containing lactic acid bacteria with calf starter from farmers on FH calf. The hypothesis of this study is that different calf starter feeding for calves can produce different performance.

2. Materials and Methods

Feeding trial was done 6 weeks used different test with two treatments with 15 replication. The material on this research were calf starter from farmer and CS-L (pellet of calf starter added 6% fermented cabbage waste), and 30 Frisian Holstein calves with aged 7-14 days and 41.14 ± 3.28 kg initial body weight. The treatments were T0: calf starter from farmer and T1: CS-L (pellet of calf starter added 6% fermented cabbage waste). Calf starter from farmer (CS-F) was formulated by farmer with crude protein 28.50% and TDN 85.71%. The ingredients of CS-F were CGM (corn gluten meal), corn mill, pollard, CGF (corn gluten feed). All of ingredient were mixed according to formula to produce CS-F in mesh form. The CS-L was made according to [6]. There were consisted of two stages. The first stage was fermenting waste cabbage. Waste cabbage was cut into small pieces, blended and added 6% salt and 6,4% sugar and then fermented in anaerobic condition for 6 days. The second stage was making the pellets calf starter. The calf starter was formulated with crude protein 19.62% and TDN 79.41% [7]. The ingredients for calf starter (corn mill, rice bran, soybean meal, molasses, mineral mix) were mixed, and then it was conditioned with temperature at 70°C during 20 minutes. Before extruding process, the temperature of calf starter should be decreased at 30°C and then fermented cabbage waste was added 6% (w/w). Pellets were extruded with diameter sized 6 mm. Then, pellets were dried in oven at ~35°C temperature to reach 13% water content.

Feeding trial was done 6 weeks consist preliminary (1 week) and observation (5 weeks). Calves feeding were 40% from CS-L and 60% from milk [2], and given twice a day at 7:00 AM and 3:00 PM. The starter feed (CS-L) was given 30 min after giving milk [8]. Water was provided *ad libitum* and

changed twice a day. Dry matter calf starter intake, body weight gain and consistency of feces were parameters observed. All data in this experiment were evaluated with t-test .

3. Results and Discussions

The data in Table 1 indicated that adding FWC in pellet of calf starter gave no significant effect on dry matter intake (DMI), but significant effect on average daily gain (ADG).

Table 1. Dry matter intake, average daily gain and consistency of feces during the experiment.

	Dry matter intake (g/day)	Average daily gain (kg/day)	Consistency of feces (skor)
T0 (CS-F)	723.69	0.53	2.40 ^a
T1(CS-L)	686.61	0.55	1.60 ^b

Note: the different superscripts in the same column are significantly different

Table 1 is showing dry matter intake, average daily gain (ADG) and consistency feces of FH calves during research. According to the result indicate that dry matter intake (DMI) and average daily gain were not different, but consistency of feces was different with two treatment. Although there were no different on dry matter intake between two treatment, the dry matter intake CS-F and CS-L were included in range daily amount solid feed for calves from 50 - 300g at the age of 3 weeks until 17 weeks ([8] [2]). There was no different in ADG from two treatment. The CS-F and CS-L treatment produce ADG were the same, although CS-F have content protein and TDN higher than CS-L. This can be explained that, although the protein and TDN CS-L levels are lower than CS-F, CS-L contains lactic acid bacteria that can balance the rumen bacteria. Furthermore, it causes rumen bacteria to perform optimal feed fermentation. In addition, lactic acid bacteria that are contained in CS-L is able to suppress harmful bacteria such as E coli. This is indicated by the consistency of feces T1 harder than T0 (Table 1), which means that calves that received CS-L treatment were healthier than those who received CS-F treatment. According to [9], that the feces consistency is solid and fused on the floor, indicating that the animal is healthy. If the calf is healthy, then the calf is able to utilize feed nutrient well to be converted into meat. This causes the average body weight gain at T1 is not different with T0.

4. Conclusion

Feeding calf starter with added fermented cabbage waste produce good calve performance.

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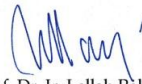
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