



Reject Biscuit as an Alternative of Feeding Materials to Improve Quality and Increase the Productivity of Milk in Smallholder Dairy Farms

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Abstract

Dairy milk in smallholder farms have an average 10-11 liters per days per lactation dairy cows and the milk quality of conventional farms have low production. One of the potential waste manufactures was reject biscuit or “crack”. Cracks were still content nutrition of feed material. The aimed of this study was to determine using reject biscuit “crack” as one kind of feed materials in order to increase dairy milk production and alternative feed that the price can reached by smallholder farms. The materials used reject biscuit “crack” obtained from UBM and Garuda Food and the lactation dairy milk. The method used survey and experiment. The materials were used concentrate content crack and without crack, elephant grass, dairy cows strain Fries Holland (FH) and milk for sample. The data were analyzed descriptive qualitative. The result showed that milk of FH cows were given concentrate without crack (T1) had average of Value density = 1.023, dry matters = 11- 11.5% and milk volume = 8 liters/day/head, while given concentrate content crack with composition 50% concentrate content crack+ 50% concentrate without crack (T2) had the average of density = 1.024, dry matters = 11.5- 12,2% and milk volume = 8,6 liters/day/head, and it given 100% concentrate content crack (T3) had the average of density = 1.025, dry matters = 12,5- 14,9%, milk volume = 9,3 liter/day/head. The conclusion of the research were the concentrate content crack can increase productivity the amount of milk volume 16.66%, density value 8% and dry matters 26% when compared to the feed material without crack.

Keywords: *Reject biscuit, Crack, Quality, Milk Volume, Smallholder dairy farm*

1. Introduction

Generally, the quality and quantity of dairy milk from smallholder farm have a range of low value, as an example in the members of smallholder farm called “Kelompok Usaha Bersama Peternak Sapi Perah Maju Mapan (KUBE PSP Maju Mapan) content milk quality were 2.9-4.7% fat content, 3-4 % lactose, 2.5-3 % protein and 10.4-12 % dry matter while dairy milk production around 7-10 liter/day/head (Survey, 2012-2014). The dairy milk has low of quality and quantity caused the factors of the feed material and feed management by the farmer.

Smallholder dairy farms in Indonesia are still depend on the cooperative institution that all of the facilities supplied by them. Such as Saponak (tools and materials for animal production), additional feed, animal health stuff, artificial insemination, even provide to economic needs such as saving, loan and milk marketing. The farmers needs additional feed such as concentrates for sufficient nutrition of dairy cows especially in the dry season. Therefore, supply of high quality concentrates in terms of protein content and TDN (Total Digestible Nutrient) are very important to raise production of dairy milk so it can also increase the welfare of the farmers.

Crack or reject biscuit waste factory is profitable alternative, it were content high nutrition while it made by raw material such as milk, eggs, chocolate, flour and others ingredients. That raw materials are content source of protein, carbohydrate and fat. The others advantages are the crack availability throughout of the year and the prices are relatively stable.

Result of the research of bread factory waste (Dried Bakery Product/DBP) such as cracks, cakes, candies, chips, biscuit, flour, snack food, and others have advantages to increase the energy value of 15 %, have a high calories, ideal supplement, raise palatability as a animal feed, decrease production costs, safety and quality. The result of research by Hetherington and Krebs (2002) state that giving 25-50 % of dry bread on goat feed increase the carcass weight of 184 pound (control) until 188 pound (25% of dry bread), and 196 pound (50% of dry bread). Feed Conversion Ratio decrease from 5.7 (control) became 5.3 (25 % of dry bread) and 4.9 (50% of dry bread), while the quality and production of wool was significantly increased. This indicate that given bread factory waste such as biscuit, dry bread and the others have advantages for animal feed, especially for ruminants.

The aimed of this study was to determine using reject biscuit “crack” as one kind of feed materials in order to increase dairy milk production and alternative feed that the price can reached by smallholder farms, especially for the member of KUBE PSP Maju Mapan dairy farm in Jabung, Malang regency. The implementation of this research were to apply research and to improve smallholder dairy farmer.

The condition of the farmer members and the dairy milk produce as follows: the average quality of raw dairy milk that deposited by member farmers of KUBE PSP Maju Mapan until now can fulfill the standards of SNI are fat content 2.9 – 4.7%, protein 2.5 – 3%, lactose 3 – 4%, and Total Solid 10.4 – 12%. Differences in quality and volume were changes by member farmers of KUBE PSP Maju Mapan generally due to different of feed quality and quantity, and equal less of feeding patterns. Therefore, the current KUBE PSP Maju Mapan holds intensive coaching to improve dairy cow productivity among the member farmers in order to increase the quality and quantity (volume) of fresh milk that is included in the next five years plan for developing of KUBE PSP Maju Mapan. The product of concentrates by KUBE PSP Maju Mapan from early establishment until now did not give perfect results in term quality, so the farmers members got mostly concentrates from the outside of UKM with the higher prices and there were no stock stability. This can affect the amount of dairy milk product. The concentrates production currently reaches only 3 ton/month, at the beginning the KUBE PSP Maju Mapan was able to produce 12-15 ton/month and continue to decline because of the down quality. This decline is due to in subsequently low quality and the availability material which is the result of the high price of raw material. Hence it needs help of the tools to milling such as cutter mill so it can advantages to take local ingredients such as corn, cassava, biscuit waste. Beside it need assistance to repair concentrates production management system and excellent formulation.

2. Method

The approach method include socialization to all employees in the small and medium enterprise, concentrate formulation training and mentoring, arrangements management application and utilization of local raw material and simulation for user farmer on Mr. Ridwan dairy farms.

The implementation has been conducted since October 2015, with the initial socialization given to employee which is done every once a month for 3 months. It will trial excellent concentrate formulation. In February, we purchased disk meal machine that was funded by PPMI Program and by business partner (KUBE PSP Maju Mapan). Furthermore, the new concentrates formulate were applied by using cracks as a one of raw materials. Disk meal machine is used for grind crack material which is a waste material from biscuit factory. Crack is used for dairy cow feed material because it contain good enough nutrient.

The crack formulation can improve the quality and quantity of dairy milk by 25%. The average dairy milk volume increased around 1.5-2 liter/head. This were proven by students of animal science department who joined the research related to their final project. Feed formulation contain crack use disk meal machine was applied by KUBE PSP Maju Mapan since October 2015 until now. The results of concentrate proximate analysis were showed after PPMI Program (as per attachment).

The next schedules are socialization and counseling to farmers about the importance of providing the best feed. The result achievement was done twice during the meeting of the head of the group held in KUBE PSP Maju Mapan. The first was done on 15 March during the internal socialization for the employees of concentrates producer and the second was done on 15 April that talking about the socialization to the farmers member, while monitoring the making of concentrates done every period. Although PPMI program has been completed, this program is still continue to do the mentoring program. At present, the small medium entrepreneur has developed business use excellent concentrates with initial product result of 4 ton/period and now the results are 7-8 ton/period. This formula concentrates were developed by fermenting the concentrate and it was called FERKONCRACK.

Research of FERKONCRACK concentrates used an experiment method using 3 treatments, T1 = control (KUD concentrate without crack), T2 = 50% KUD concentrate + 50% concentrate content crack and T3 = 100% concentrate content crack. Data was analyzed by descriptive quantitative, design used CRD (Cross over Design). The Materials were dairy milk samples that was produced by lactated dairy cow have been treated density test, total solid and volume test. The tools were used lactodensimeter by Germany, lactoscan made in Austria and milk volume scale size 10 liter. Milk sample were analysis every morning and afternoon and then calculate the average of them.

3. Result and Discussion

3.1. Concentrate Formulation

As a result of PPMI program which is to apply the excellent concentrate formulation that has been done in two stages. First stage by conducting proximate analysis to find out the nutrition value of excellent concentrate contain crack and then the second step is conducted trials (treatment) as a dairy cows feed materials belong to members of KUBE PSP Maju Mapan which will be produced its concentrates for an acquirement Sarana Produksi Peternakan (Sapronak) (animal production facilities) for the members. The results of proximate analysis were shown in the table 1.

Table 1: The analysis results of Crack concentrate dairy cow formulation (FERKONCRACK) in UKM/ KUBE PSP Maju Mapan (Researcher partner)

Code	Dry Matter	Water Content	Ash Content	Organic Matter	Crude Protein	Crude Fat	Crude Fiber	BETN	ME	TDN
Formula 1	90.02	9.98	7.96	92.4	14.79	9.67	17.48	40.13	2475.1	94.15
Formula 2	82.48	17.52	25.73	74.27	18.01	3.18	10.58	24.98	1821.2	60.73
Formula 3	85.25	14.75	16.85	83.33	17.4	5.42	14.03	32.56	2148.1	77.44
Unit	%	%	%	%	%	%	%	%	kcal	

Description: analysis result by Nutrition laboratory University of Muhammadiyah Malang January 2016

The proximate analysis results are shown in Table 1. The formula 3 is an ideal formula compared to formula 1 and 2. The crude protein value is 17.4%, crude fiber 14.03%, TDN (Total Digestible Nutrient) 77.4% and energy value 2148.15 K cal. Feed and nutritional of lactation dairy cow is not only valued from the content of feed but also should pay attention to the TDN which is a measure of the feed that it is determined by digested and absorbed well in the rumen. Digestible value and fiber crude on the ruminant is needed to investigate increasing production and quality of milk. Lactation dairy cow need energy value above 1800 kcal and protein above 15 for the high

milk quality. According to Throckmorton (1987) in Hetherington and Krebs (2002) cracks is a one of the alternative feed matters by bread factory waste that have high calories, complete nutrition, as a stimulant to increase the consumption, increase feed efficiency in the absorption of nutrients and supplies amino acid and energy for the ruminants.

3.2. The Effect on the use of concentrates containing ‘Crack’

The second phase of research was the implementation of the application PPMI Program that compared concentrates without cracks produced by KUD and concentrates contain cracks produced by KUBE PSP Maju Mapan. All of the treatment were applied by the member farmers of KUBE PSP Maju Mapan and smallholders farmers in Batu, Malang. The results of the use crack concentrates research are presented in Table 2. The indicators are density value, dry matter (total solid) and milk volume produced from dairy cattle type of Fries Holland (FH) owned by smallholder farmers.

Table 2: Average of Quality and Quantity of lactation dairy milk used concentrates “cracks”

Treatment Matter average	Volume average	Density average	Dry
Concentrates control	8.01	1.0234	11.9
Concentrates 50% Crack	8.51	1.0242	12.55
Concentrates 100% Crack	9.35	1.0248	13.39
Unit	liter	-	%

Based on Table 2, it is shown that the use of dairy concentrates containing cracks 50% increased the volume of dairy milk by 0.51 liters, 0.011 of density value and 0.65% of dry matters became 8.51 liters of dairy milk volume, 1.0242 of density value and 12.55% of dry matters. While the concentrates that contains 100% cracks increased the dairy volume by 1.34 liters, 0.014 of density value and 1.49% of dry matters compare by control treatment became 9.35 liter of dairy milk volume, 1.0248 density value and 13.39% of dry matters. This shows that the use of concentrates with crack content can increase volume and quality of milk. The increase of the dairy milk volume will increase the farmers’ income. Likewise, if the dairy milk quality increases due to the dry matter price then the product price will also increase, along with the fat, protein and other components will also increase.

According to Abdullatif et al. (2004) the use of DBW (Dried Bakery Waste) to 30% in broiler feed increased its energy and protein content which eventually increase the body weight of the chicken. This occurred due to the fat and sugar content of DBW which gave 3200 kcal and 22% of protein to the broiler finisher diet, which means it is more efficient when compared to those without DBW. Likewise, according to Heterington and Krebs (2002) the use of dry bread waste such as pizza, cracks and others can increase the body weight, the quality and quantity of wool sheep, this is as a result of the increase of feed intake is in line with the increase of feed palatability.



Fig 1: Rejected Biscuit (Crack)



Fig. 2: Process and dish meal machine used for grinding and Cracks mixing machine "FERKONCRACK"

4. Conclusion

The conclusion of the research were the concentrate content crack can increase productivity the amount of milk volume 16.66%, density value 8% and dry matters 26% when compared to feed material without crack content and crack recommended as an alternative feed. This research is an application of the Internal Community Service Program that applied the alternative improvement system of concentrate product to increase the production and quality of dairy milk of smallholder farms in KUBE PSP Maju Mapan Kemiri village, Jabung district, Malang.

References

- [1] Abdullatif A. Al. Tulaihan, Huthail najib, and Ard Saleh M. Al Eid. (2004). The Nutritional Evaluation of Locally Produced Dried Bakery Waste (DBW). in the Broiler Diet. *Pakistan Journal of Nutrition* 3(5) : 294-299
- [2] Abun. (2008). Hubungan Mikroflora dengan Metabolisme dalam saluran Pencernaan Unggas dan Monogastrik. Makalah Ilmiah Jurusan Nutrisi dan Makanan Ternak. Fapet. Unpad. Jatinangor.
- [3] Astawa, P.A., I.B.G. Partama, P. Sudyadnya, and I.N.S. Sutarpa. (2011). Effect of Vitamain- Mineral Supplementation in Comercial feed on Digestibility Coeficient and Rumen Fermentation of Bali Catle. *Journal of The Indonesian Tropical animal Agriculture* 36 (1) : 69-74.
- [4] Ayub M., A. Tanveer, M.A. Nadeem and S. M.A. Shah. (2004). Studies on the Fodder Yield and Quality of Shorghum Grown Alaone and in Mixture with Rice Bean. *Pakistan Journal of Life and Social Sciences* 2(1) : 46-49.
- [5] Hetherington R.F. and G.L. Krebs. (2002). The Use Of Bakery Wastes In Feedlot rations For Sheep Animal Production Austria Vol. 24 : 89-92. *Anim. Prod. Aust.* 2002 Vol. 24: 89-9289.
- [6] Singarimbun, M, dan Efendi S. (2006). Metode Penelitian Survey. Yogyakarta :LP3ES.
- [7] Throckmorton, J.C., Ffoulkes, D., Leng, R.A. and Evans, J.V. (1981). In 'Recent Advances in Animal Nutrition 1981'. (Ed. D.J. Farrell) p. 22 A (University of New England: Armidale).
- [8] Yeo, J. and K. Kim. (2012). Analisa Pakan Perlakuan. Laboratorium Ilmu dan Nutrisi makanan Ternak. Fakultas Peternakan Universitas padjadjaran. Jatinangor Bandung.Sumedang.