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A STUDY ON ANIMAL FEED, LABOUR USE AND MILK PRODUCTION IN DAERAH ISTIMEWA YOGYAKARTA PROVINCE DAIRY FARMING

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Abstract

An efficient milk production system depends largely on three factors – animal species, nutrition and animal care. The most important input for increasing the animal productivity is the quality and quantity of feed. A properly balanced dairy cows ration should consist of 2.6 lb of fodder fed per 100 lb of lactating cow body weight per day and 5.5 lb of concentrate fed per lactating cow per day. Since fodder quality is poor and the feeding of concentrate is below the balanced ration, dairy cows are unable to produce milk to their latent capacity. Stall-feeding is common practice in Indonesia, but little information is available on it because of the difficulties in assessing the amount of fodder stall fed animals consume. The animal up keep, including milking, feeding, watering, etc, is a labour-intensive activity, involving most of the family members. But little is known about the labour use, including family labour in dairy farming in Indonesia. Thus, this paper analyses the aspects related to the dairy cows feeding, labour use and employment pattern in dairy farming and milk production in Daerah Istimewa Yogyakarta Province. The findings show that almost all the farmers stall feed of the dairy cows twice or thrice a day, feeding fodder and concentrate separately. There are more tendencies for female family members to perform the dairy work in the rural area. In Daerah Istimewa Yogyakarta Province there is still a room to improve milk production, mainly by improving nutrition through balanced ration feeding of fodder and concentrate.

Key words: Animal feed, Labour use, Milk production

Introduction

The quality and quantity of feed provided to animals is the most important input for increasing the animal productivity. Since the fodder quality is poor, the feeding of concentrate is critically needed. According to Etgen and Reaves (1987) a properly balanced dairy cows ration should consist of 2.6 lb of fodder fed per 100 lb of lactating cow body weight per day and 5.5 lb of concentrate fed per lactating cow per day.

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Labour is also an important input in milk production and the dairy farming. The knowledge of dairy cows care, including milking, feeding, watering, etc, and the requisite skills needed in dairy farming determine the quality of labour, an input to enhance the productivity of dairy cows. But in a low productivity framework, the work of maintenance and rearing of dairy cows is done by non-professionals, as their opportunity cost is low. The dairy farming gainful employment to rural households through out the year, and the use of family labour is more common than hired labour. This paper will analyses the aspect related to dairy cows feeding, labour use and employment pattern in dairy farming and milk production in Daerah Istimewa Yogyakarta Province.

Materials and Methods

Research Material

The materials of this research are dairy farmers who live in Daerah Istimewa Yogyakarta Province and the members of Warga Mulya Dairy Cooperative.

Methodology

The case study of dairy cooperative in DIY Province was considered for the positive analysis, undertaking research survey of cooperative that represent different regencies; Sleman Regency (rural area), Bantul Regency (sub urban area) and Yogyakarta Municipality. The number of dairy farming households in DIY Province were 1,175 and 114 farming households, consist of 99 in Sleman Regency, 8 in Bantul Regency and 7 in Yogyakarta Municipality, were randomly selected for the in depth study. Data were collected by interview with dairy cooperative officials and the farmers through a structured questionnaire, on site observation and participatory appraisal.

Results and Discussion

Dairy cows composition is based on the age of cows, calves, young and adult. Lactation cows, dry cows and bull categorize adult. Although Jerseys could better tolerate the average in Daerah Istimewa Yogyakarta Province and the Animal Husbandry Service has been promoting the Jerseys since 2000, the farmers prefer to rear Holstein crossbreed as they are more used to rearing this breed. There are only 4 Jerseys owned by two farmers in Sleman.

Table 1 presents the average dairy cows holding by the farmers in all three regions. They are 3.6 in Sleman, 6.3 in Bantul and 6.4 in Yogyakarta and are composed of lactating cows, currently dry cows, heifer that would be lactating in time of 2-12 months, and calves that would be lactating after 24 months with normal rearing.

Table 1. Composition and number of dairy cows holding per household in the study regions

Description	Sleman	Bantul	Yogyakarta
Average dairy cows holding (head)	3.6	6.3	6.5
Lactating	1.4 (38.9)	3.4 (54.0)	4.9 (75.4)
Dry	0.5 (13.9)	1.2 (19.0)	0.8 (12.3)
Heifer	0.6 (16.7)	1.0 (15.9)	-
Calves	1.1 (30.5)	0.7 (11.1)	0.8 (12.3)
Lactating : dry ratio	74:26	74:26	86:14
Milk production/head/year (litres)	2,005.9	2,308.3	2,068.4
Lactation period (days)	289.9	292.9	295.0
First calving age (months)	28.6	27.8	28.0
Calving number (time)	4.5	5.5	4.6
Calving interval (months)	17.2	15.2	16.2

Source: Filed Survey, 2001
Note: Inside ( ), percentage is shown for each of the dairy cows composition

The ratio of lactating cows and currently dry cows are 74:26 in Sleman and Bantul and 86:14 in Yogyakarta. The farmers in Yogyakarta try to increase the ratio of lactating cows in its herds as a management strategy by replacing the dry cows and heifers with lactating cow.

Milk production per head per year is 2,308.3 litres in Bantul the highest, 2,068.4 litres in Yogyakarta, and 2,005.9 litres in Sleman the lowest. Milk production is closely related to lactation period. The average lactation period is 289.9 days in Sleman, 292.9 days in Bantul and 295.0 days in Yogyakarta not much different among the three regions. The ideal lactation period for the regions is 305 days (Kusumadewa *et al,* 1988) and recommended length of the dry period is 45 to 60 days (Etgen and Reaves, 1987). Hence, there is a room to improve the lactation period and increase milk production in all three regions. The average lactation period and milk production should be increased by improving breed and feed quality. In order to improve breed quality, artificial insemination has been implemented using almost 860 doses of good quality bull semen in 2000.

Thus, the most important aspect of dairy farm management for increasing milk production is the quantity and quality of feed provided to animals. The animal feed is divided into concentrate and fodder and their balanced ratio is regarded to be very important to sustain and or increase the production (of milk) and reproduction ability of cow. Since fodder quality, composed of green grass and dry roughages, is variably poor, dairy cows are unable to produce milk unless they are fed with concentrate in addition to fodder. The feeding practices that are followed in three regions have been summarized in Table 2. The entire farmers stall feed the dairy cows two or three times a day generally feeding fodder and concentrate separately.

But in Sleman some (9.1%) farmers feed their dairy cows only once a day in the morning, giving fodder and concentrate together. Farmers in Sleman mostly feed their animal in group, whereas in Yogyakarta most practice the individual type of feeding. In Bantul both the methods are practiced in almost same ratio. In terms of quantity, it is very difficult to calculate the amount of fodder given to an animal as they are fed in lump sum amount. The average daily concentrate given to lactating cow per head is 3 kg, 4,5 kg and 4 kg in Sleman, Bantul, and Yogyakarta, respectively. Currently dry cows are not fed concentrate in Sleman. In Bantul and Yogyakarta currently dry cows are fed concentrate half the amount of lactating cow's allocation.

Table 2. Feeding practices in the study regions

Regions	Frequency of feeding per day			Type of feeding	
	Once	Twice	Thrice	Individual	Group
Sleman	9 (9.1)	12 (12.1)	78 (78.8)	11 (11.1)	88 (88.9)
Bantul	-	1 (14.3)	6 (85.7)	3 (42.9)	4 (57.1)
Yogyakarta	-	-	8 (100)	7 (87.5)	1 (12.5)

Source: Field Survey, 2001

Note: Once; fodder and concentrate are fed in the morning. Twice; fodder is fed in the morning and concentrate in the afternoon. Thrice; fodder is fed twice in the morning and afternoon, and concentrate is fed after morning milking.

The first calving age is 28.6 months in Sleman, 27.8 months in Bantul and 28.0 months in Yogyakarta is not much different among the three regions. But the calving number is nearly same in Sleman and Yogyakarta; being 4.5 and 4.6, respectively. But it is higher (5.5) in Bantul. The calving interval is 17.2 months in Sleman, the longest, 15.8 months in Bantul, the shortest and 16.5 months in Yogyakarta, in between the two (Table 1). Both of these reproduction qualities are related to milk production affecting the milk production adversely if the first calving age and calving intervals are high and long. In addition to breed of the cow and feed quality, heat detection also plays a vital role to improve these reproduction abilities of the animal. Hence, the ability to properly detect the heat and inseminate the animals in proper time is very important to improve the reproduction quality of animal and consequently increase the milk production. The insemination technology and facilities play an important role in this matter.

Labour Use in Dairy Activities

The farmers and dairy cattle are the two most important factors to determine the degree of profitability and personal satisfaction derived from dairy farming. The farmers are responsible for doing many things, including a number of little things needed to be done in dairy farming. Doing these things well and when they need to

be done can make dairy farming a profitable job and an interesting and challenging way of life. Neglecting them can make the dairy farming a failure or return a little profit.

Labour is one the important input in dairy enterprise. The knowledge of dairy cow management and the requisite skills needed in dairy farming determine the quality of labour, and quantity input to enhance the productivity of dairy cows.

Table 3. Dairy farming labour use per household per annum in the study regions

Dairy farming activities	Sleman		Bantul		Yogyakarta	
	Female	Male	Female	Male	Female	Male
Cleaning animal house	12.4	45.6	35.7	57.3	-	90.8
Cleaning cows	45.6	4.8	93.2	3.5	-	84.6
Milking	34.2	2.6	78.6	6.7	-	103.2
Feeding	35.2	33.8	72.4	65.8	-	126.1
Watering	29.0	12.1	67.6	10.8	-	93.2
Delivering milk	22.8	1.4	94.3	81.8	-	215.5
Cutting fodder	34.2	92.8	-	136.9	-	-
Others	1.2	1.7	1.6	5.2	-	4.8
Sub total	214.6	194.8	443.4	368.0	-	718.2
Total	409.4		811.4		718.2	
Man day labour use per cow	60.6	55.0	70.5	58.5	-	122.5

Source: Field Survey, 2001

Note: One man day is 8 hours. Others includes, going to cooperative office for artificial insemination, concentrate and credit

In Indonesia, like in the study region, dairy is mostly undertaken by small farmers rearing few numbers of cows. For them dairy is one of the components of the farming. They basically use family labour, both male and female, to perform the dairy farming activities from cleaning animal house and animal, milking, watering, delivering milk to cutting fodder and work related to cooperative facilities usage. When they have to hire labour for such activities they hire local people, all male.

Table 3 shows the data on man days labour use for various dairy farming activities in the three study regions. The highest labour use per cow is in Bantul (129 man days) followed by Yogyakarta (122.5 man days) and Sleman (115.6 man days).

Because of the nature of the dairy work, usually centred in the homestead area, like cleaning cows, milking, feeding, watering and delivering milk, there is a tendency for more female family members to perform them in Sleman and Bantul. More than half of the dairy farming activities are done by female family members in these two regions. In Yogyakarta, almost all the dairy farming activities are done by hired male labours and most of family members, male and female, are engaged in other jobs, such as, clerical work, business and professional work. In Sleman hired

labour used in dairy farming activities is very low (3.4%), hired only during the peak period of harvesting and cultivating. Where as in Bantul it is rather high (35.8%). All such hired labours are males in both the regions (Table 4).

Table 4. Family labour and hired labour use per cow per household in the study regions.

Regions	Man day family labour			Man day hired labour (male)	Total
	Female	Male	Total		
Sleman	60.6 (52.4)	51.1 (44.2)	117.7 (96.6)	3.9 (3.4)	115.6 (100)
Bantul	70.5 (54.7)	12.3 (9.5)	82.8 (64.2)	46.2 (35.8)	129.0 (100)
Yogyakarta	-	6.7 (5.5)	6.7 (5.5)	115.8 (94.5)	122.5 (100)

Source: Field Survey, 2001
Note: Inside ( ) is percentage

Thus, it can be understood in the study regions that the dairy farming use unused and underused female (family) labour and male (family and hired) labour to generate earning from dairy farming which contributes in the household's strategy for survival and welfare.

Conclusion

The first and foremost step in dairy farming is to make adequate feed available to provide minimum level of nutrition. Better feeding being a short-term measure, lasting solution for increasing the milk production in dairy farming improvement through scientific breeding. Feeding would go waste if the dairy cows are genetically low producers and inefficient converters of concentrate and fodder into milk.

Dairy farming is labour intensive. Typically, most of the women family members are involved in these activities because of the nature of the dairy work usually centred in the homestead area. This condition is true in Sleman and Bantul Regencies, otherwise in Yogyakarta Municipality; almost all the dairy farming activities are done by the male hired labour.

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