



Original Article

Preliminary Survey on the Dairy Cattle Production System and Conventional Feed Resources in the Central Dry Zone of Myanmar

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ARTICLE INFO

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How to Cite this Article:

Aung, M., M. Khaing, T. Ngwe, K.S. Mu, M.T. Htun, L.N. Oo and A. Aung. 2015. Preliminary Survey on the Dairy Cattle Production System and Conventional Feed Resources in the Central Dry Zone of Myanmar. *Global Journal of Animal Scientific Research*. 3(2): 383-387.

Article History:

Received: 31 December 2014

Revised: 24 January 2015

Accepted: 26 January 2015

ABSTRACT

This survey was carried out to evaluate the dairy cattle production system, conventional feed resources and their nutritive values in Central Dry Zone (CDZ), Tatar U and Amarapura Townships, in Myanmar. The secondary data and questionnaires were assessed from 180 farmers of 180 households in the study area and made Focus Group Discussion (FGD) with them. According to the findings of this survey, most of farmers were relying on the agriculture for their livelihood and livestock farming played as the secondary role. As the gender issue, the role of female was vital for the development of dairy production sector indicating that female were the resource person in small-scale dairy production system. Generally, one household possessed 4 cattle including milking cows, heifers and calves. As breeding, natural breeding was still important for small-scale dairy farmers and the calving intervals were between 12 and 18 months. The average 11.5 kg of milk per cow were recorded from the study area. Among the conventional feed resources, butter bean residue, natural grass and sesame residue were used as the roughage sources in diet when rice straw was not available. These feedstuffs were valuable potential to be used in the ration of dairy cow.

Keywords: Dairy cattle production system, Conventional feed, Gender issue.

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INTRODUCTION

Poor quality feed is one of the major factors limiting livestock productions. During the dry season, the natural pastures and crop residue available for animals after crop harvesting are usually fibrous and devoid of most essential nutrients including protein, energy, minerals and vitamins which are required for increased rumen microbial fermentation and improved performance of the host animal. Smallholder dairy production favours the potential to poverty alleviation, food security, improved family nutrition, income and employment generation (Uddin *et al.*, 2012). Tesfay (2014) pointed out that dairy farmers at the peri-urban area rely on the dry and green roughages for the feed of their animals. And he also recommended that forage development strategies and feed conservation should be encouraged at that area. The

small-scale livestock farmers in developing countries generally use locally available feed resources, such as natural pasture, crop residue, cut-and-carry grass, forage crops and local feedstuffs. However, the data concerning the dairy production system of smallholders, conventional feed resources and nutritive values were still limited in Myanmar. Therefore, this survey was carried out to evaluate dairy production system, conventional feed resources and their nutritive values in the Central Dry Zone (CDZ), Tatar U and Amarapura townships, in Myanmar.

MATERIALS AND METHODS

This survey was carried out as preliminary survey in the Central Dry Zone (CDZ), Tatar U and Amarapura Township and the small-scale dairy farmers were targeted. Firstly, three villages from each township were chosen and interviewed with the villagers. The secondary data regarding dairy farming from the authorized persons were recorded. According to the systemic random sampling, 30 villagers from each village were selected, interviewed and have done Focus Group Discussion (FGD) with them. In the interview, the questionnaires concerning the conventional feed resources, feeding strategies, livestock holding, breeding, herd size, milk yield, calving interval and gender equity in activities of livestock farming were assessed.

After that, samples of conventional feeds were collected for the chemical analysis. All ground samples were analyzed for dry matter (DM), organic matter (OM) by the method described by AOAC (1990) and neutral detergent fibre (NDF) and acid detergent fibre (ADF) by Goering and Van Soest (1970). Nitrogen contents were analyzed by using Kjeldahl method (Foss 2020 digester and Foss 2100 Kjeltac distillation unit) and crude protein (CP) is calculated as $6.25 \times N$ (AOAC, 1990).

RESULTS AND DISCUSSION

Household demographic at survey townships, Tatar U and Amarapura, are shown in Table 1. In accordance with those results, most of farmers were relying on the agriculture for their livelihood and livestock farming played as the secondary economic role. Concerning the role of gender issue on the small-scale dairy farming system, it was found that the role of male, female and both sex were 26%, 54% and 20%, respectively. According to this result, it could be assume that the female were the main person who drive to develop the small scale dairy production because the men, heads of the households give their attention on the agriculture as the main business of their livelihood.

Table 1: Household demographic at survey townships

| Villages | Number of Household | Main business | | | Size of family | Gender equity in livestock farming activity | | |
|------------------|---------------------|---------------|-----------|-------|----------------|---|--------|------|
| | | Cropping | Livestock | Other | | Male | Female | Both |
| Tatar U | | | | | | | | |
| Sin Tel | 30 | 22 | 8 | 0 | 5 | 3 | 16 | 11 |
| Myay Ngu | 30 | 30 | 0 | 0 | 5.5 | 1 | 11 | 18 |
| Tapel | 30 | 30 | 0 | 0 | 5 | 6 | 19 | 5 |
| Amarapura | | | | | | | | |
| Thu Nge Taw | 30 | 14 | 7 | 9 | 5 | 8 | 19 | 3 |
| Thayar Aye | 30 | 16 | 14 | 0 | 5 | 16 | 14 | |
| Shan kalay | 30 | 24 | 2 | 4 | 5 | 12 | 18 | 0 |
| Average/village | 30 | 23 | 5 | 2 | 5 | 8 | 16 | 7 |
| % of households | | 76% | 17% | 7% | | 25% | 54% | 21% |

The nutritive values of feedstuffs and four diets (three common diets used by farmers in Tatar U and one common diet in Amarapura) are shown in Table 2 and 3. According to the

result, some regions, such as Sin Tel and Myay Ngu villages in Tatar U Township, used sesame residue and butter bean stalk as the main basal feedstuffs for the dairy cattle. In the Ta Pel village (Tatar U), most of farmers fed sorghum stover to dairy cattle more than other villages. In Amarapura Township, the farmers also used rice straw and sorghum stover as the basal feedstuffs and supplemented with chickpea mill in diet. As the feeding strategies, firstly, the broken rice and cottonseed cake are mixed and then soaked in the water for little hours. After that, that concentrate mixture were fed to animal and followed by roughages such as rice straw, sorghum stover, natural grass and sesame residue.

Table 2: Ingredient composition of conventional diets at survey townships

| Description | Diet 1 | Diet 2 | Diet 3 | Diet 4 |
|---------------------|--------|--------|--------|--------|
| Rice straw | 23 | 21 | 23 | 33 |
| Sorghum stover | 14 | - | 36 | 9 |
| Sesame residue | 25 | - | - | - |
| Natural grass | - | 17 | - | 11 |
| Butter bean residue | - | 34 | - | - |
| Cottonseed cake | 29 | 20 | 35 | - |
| Broken rice | 8 | 8 | 6 | 7 |
| Chickpea mill | - | - | - | 40 |

Diet-1: Common diet-1 from Sin Tel village, Tatar U Township

Diet-2: Common diet-2 from Myay Ngu village, Tatar U Township

Diet-3: Common diet-3 from Ta Pe l village, Tatar U Township

Diet-4: Common diet from Amarapura Township

Table 3: Nutritive values of feedstuffs and diets at survey townships

| Description | DM | OM | CP | NDF | ADF |
|---------------------------|-------|-------|-------|-------|-------|
| Tatar U Township | | | | | |
| Rice straw | 87.87 | 85.54 | 4.60 | 72.95 | 53.78 |
| Natural grass (Fresh) | 41.32 | 89.39 | 8.18 | 68.62 | 36.63 |
| Butter bean residue (Dry) | 83.60 | 96.73 | 5.86 | 77.50 | 67.76 |
| Lablab bean stalk (Fresh) | 20.62 | 8.76 | 19.48 | 58.95 | 4.73 |
| Cottonseed cake | 86.50 | 93.00 | 37.25 | 56.22 | 24.96 |
| Sesame residue (Dry) | 74.32 | 92.24 | 8.50 | 61.97 | 56.77 |
| Sorghum stover (Fresh) | 21.63 | 89.21 | 9.59 | 74.81 | 48.82 |
| Sorghum stover (Dry) | 77.76 | 93.95 | 3.29 | 80.03 | 54.52 |
| Broken rice | 89.43 | 98.58 | 9.04 | 12.69 | 0.74 |
| Amarapura Township | | | | | |
| Rice straw | 86.83 | 84.26 | 4.55 | 72.95 | 53.78 |
| Sorghum stover (Fresh) | 14.76 | 78.88 | 10.56 | 68.10 | 49.67 |
| Natural grass (Fresh) | 17.91 | 81.17 | 18.15 | 52.21 | 32.30 |
| Broken rice | 90.43 | 97.26 | 9.34 | 12.05 | 0.69 |
| Chickpea mill | 87.08 | 93.53 | 16.00 | 60.80 | 55.16 |
| Diets | | | | | |
| Diet-1 | 58.94 | 90.98 | 16.09 | 60.62 | 40.05 |
| Diet-2 | 53.99 | 90.27 | 16.46 | 59.07 | 34.74 |
| Diet-3 | 41.69 | 90.22 | 17.96 | 64.24 | 38.87 |
| Diet-4 | 46.7 | 88.12 | 11.46 | 61.26 | 47.98 |

Dairy productions and milk yield at survey townships are presented in Table 4. Each farmer averagely possessed 4 dairy cattle (including milking cows, heifer and calves) and most of milking cows produced 11.5 kg of milk per day. Some reproductive traits at survey townships are shown in Table 5. The use of artificial insemination (AI) in that area is still little in comparison with natural mating because 23% of total breeding in cows were inseminated with AI and the rests (77%) were impregnated by the natural breeding. No information on AI for breeding was recorded in Tatar U. However, the desirable results on reproductive performances (calving interval; 12-18 months and less than 8% in total abortion case) were observed. This might be due to the nutrient contents of diet offered to those cattle

(Table 3). It was assumed that the conventional diets offered those dairy cattle contained adequate amount of nutrients they required. This finding was also deal with the reports of Ahmed (2006) and Alam and Sarder (2010) who said that improved feeding significantly reduced the calving interval. These results were conformity to the findings of Ghosh *et al.*, (1993) and Jalil *et al.*, (1995) who indicated that improved feeding has a positive effect on reproductive performance. Moreover, high milk production and imbalanced feeding is one of the factors for reproductive disorders in crossbred cows (Shamsuddin *et al.*, 1998). According to the result shown in Table 3, the amounts of nutrient in those diets are in the range of the nutrients requirement recommended by NRC (2001) in which CP 15-16% DM was enough for the cow of milk production, 20 kg/ day. Some calving interval showed 12 months (59%) and some were 18 months (41%) interval. Dziuk and Bellows (1983) also pointed out that the calving to first estrus is an important parameter affected by feeding.

Table 4: Dairy productions and milk yield/cow/day at survey townships

| Villages | Numbers of dairy cattle/30 household | | | Milk Yield /day (kg) |
|-----------------------|--------------------------------------|--------|--------|----------------------|
| | Cows | Heifer | Calves | |
| Tatar U | | | | |
| Sin Tel | 93 | 16 | 97 | 10.7 |
| Myay Ngu | 67 | 11 | 59 | 13.9 |
| Tapel | 79 | 22 | 74 | 15.7 |
| Amarapura | | | | |
| Thu Nge Taw | 48 | 12 | 15 | 8.3 |
| Thayar Aye | 68 | 14 | 56 | 10.7 |
| Shan kalay | 34 | 19 | 12 | 9.9 |
| Average/30 households | 65 | 16 | 52 | 11.5 |
| Average/household | 4.4 dairy cattle | | | |

Table 5: Some reproductive trait at survey townships

| Villages | Breeding | | Calving Interval | | Abortion | |
|------------------|----------|----------------|------------------|-----------------|----------|----|
| | AI | Natural mating | Up to 12 months | Up to 18 months | Yes | No |
| Tatar U | | | | | | |
| Sin Tel | 0 | 30 | 15 | 15 | 2 | 28 |
| Myay Ngu | 0 | 30 | 18 | 12 | 0 | 30 |
| Tapel | 0 | 30 | 19 | 11 | 0 | 30 |
| Amarapura | | | | | | |
| Thu Nge Taw | 13 | 17 | 20 | 10 | 3 | 27 |
| Thayar Aye | 18 | 12 | 16 | 14 | 5 | 25 |
| Shan kalay | 8 | 12 | 8 | 6 | 0 | 20 |
| Average/village | 7 | 22 | 16 | 11 | 2 | 27 |
| % of breeding | 23 | 77 | 59 | 41 | 7 | 93 |

CONCLUSION

It could be concluded that female were the resource person in small-scale dairy production. Less artificial insemination (AI) practice and abortion cases were found in the study area. Small-scale dairy farmer possessed less than 5 dairy cattle including milking cows, heifer and calves. Sorghum stover, sesame residues and butter bean residue were valuable potential to be used in the ration of dairy cow.

ACKNOWLEDGEMENTS

A special thank is extended to all Laboratory staff member of Department of Physiology and Biochemistry for their assistance during this research work. It is unforgotten to convey thanks to IAEA Project, MYA/5/011, for the provision of chemicals required for this experiment.

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