

Challenge and Comprehensive Approaches to Improve Dairy Cattle Production and Promotion; the Case of Jimma Town Milk Producers Union

Masreshaw Yirga^{1,3*}, Zigyalew Gashaw^{1,2}, Neim Semman^{1,3}, Teferi Pawulos¹, Tamirat Belayneh¹, Samuel Shaweno¹, Tadesse Moreda¹, Yoseph Worku¹, Marlin Levi¹

¹Jimma University, College of Agriculture and Veterinary Medicine, Jimma, Ethiopia

²Injibara University, Department of Horticulture, Ethiopia

³Jimma Agricultural Research center, Department of crop science, Ethiopia

***Corresponding Author:** Masreshaw Yirga, Jimma University, College of Agriculture and Veterinary Medicine, Jimma, Ethiopia.

ABSTRACT

Despite livestock production plays a considerably role to the national economy and the livelihood of the people in Ethiopia, yet, its productivity is extremely low in terms of milk, and meat production primarily due to direct and indirect impact of poor quality and insufficient feed. The current study was conducted with the aim of providing comprehensive solution to the problems of Dairy cattle feeds and feedings of "Jimma town Cooperative Milk Producers Union" which is located at Seto Semero specific site, southwest Ethiopia. The research approach consisted of survey, establishment of fresh fodder, preparation of urea treated straw and technical skill building through training. The research finding revealed that questioners were developed and 25 members of the union were interviewed. Based on the response of the members, problem was ranked. Accordingly, UREA treated teff straw was prepared in its procedure and fresh fodders like elephant grass, vech, alfalfa and Sesbaniasesban were established with full participation of the union members. Training about these forage establishment, preparation and their feeding system was given to the producers. For the sake of the dairy milk product promotion T-shirts were prepared by group members. Finally, the field demonstration work was visited with the participation of the union members and other invited guests. In general improved dairy feed have a direct relation with milk production. Hence, producers should have know-how about the production and quality of dairy cow feed and feeding systems for the stability of milk production.

Keywords: Dairy cattle, nutrition, forage

INTRODUCTION

In tropical regions, cattle industry is based on crosses of Zebu and European breeds managed in dual-purpose systems of milk and beef that are sustained mainly on grazing of tropical grasses. The demand for livestock products is increasing from time to time due to the population increase in the world as well as in the local market. Therefore, making improvements in the raised factors to enhance livestock productivity and production helps to ensure food security and to earn benefits from the sector.

Nutrition is one main factor which affects the dairy cow yield and proportion of milk components. Through the diet, the mammary gland is supplied with blood components to synthesize milk. Non-nutritional factors such as heredity, days in milk, parity, infections and

number of cells, as well as temperature and humidity, often overshadow nutritional effects. Hence, Proper feeding management of the dairy herd can improve the economy of production and provide for a healthier cow. The use of concentrates is fundamental to increase milk production. However, the ingredients that compose the concentrate are expensive, raising the feeding costs (Pimentel *et al.*, 2013). Therefore, limited data on improving milk production efficiency in dairy animals through balanced feeding suggests that there is considerable scope for the enhancement of milk production with the existing feed and animal resources. This can be made possible through the transfer of scientific knowledge, in an easy to use and easy to implement manner to rural milk producers (Garg, 2012). Livestock play a crucial economic role in Ethiopia economy. The

country has enormous potential for increased livestock production, both for local use and for export. Nowadays the demand for livestock products is increasing from time to time due to the population increase in the country. However, the productivity of the sector is constrained by technical factors, among which are inadequate feed resources, poor livestock husbandry, and low genetic potential of the indigenous national herd. Lack of strong extension and marketing services, as well as an encouraging policy environment are also serious constraints (MoA and ILRI., 2013). The major feed resources in the country are crop residues and natural pasture, while agro-industrial by-products and manufactured feed contributing much less. The importance of natural pasture is gradually declining because of the expansion of crop production into grazing lands, redistribution of common lands to the landless and land degradation (Berhanu *et al.*, 2009).

It has been observed that the milk production by smallholder dairy farmers during the dry season is significantly reduced. During that period, which might last up to six months per year, the quantity of milk, which the average farmer is able to sell and deliver, is reduced by 35% - 60%. This means that the income of those farmers is hardly affected during that period (Pandey and Voskuil, 2011). During the dry season, when sufficient amounts of forage are not available, feeding of grazing cattle with feed supplementation is practiced to maintain productivity (Montiel, 2007).

Generally, imbalanced feeding leads to excess feeding of some nutrients whilst others remain deficient. This not only reduces milk production and increases costs per kg milk, but also affects various physiological functions including long term animal health, fertility and productivity.

A balanced ration should provide protein, energy, minerals and vitamins from dry fodders, green fodders, concentrates, mineral supplements etc., in appropriate quantities to enable the animal to perform optimally and remain healthy (Indian Livestock Census, 2007). For this fact, many smallholder farmers do not have the necessary skills and knowledge to prepare balanced rations, this can be achieved through providing ration balancing advisory services direct to the farmer through village based trained local resource persons. To ensure this it is necessary to augment and secure feed resources through short and long term planning.

The target population, Jimma Town Milk Producers Union has been challenged by many problems while producing milk and milk products. They are hindered by low quality of dairy cow feed. They are also not preparing and providing enough improved feed for their dairy cows using locally available inputs. They think of improved feed as it can only be obtained from far-flung cities where there are advanced production system and especial inputs. They do not have enough awareness on how to feed their cows and how to prepare improved feed, like urea treatment, and development of fresh forages. They are also lacking technologies that could help them prolong the shelf-life of their products. Therefore, improving milk production is an important for improving the quality of life the people in the town in general and the members of the union in particular. Therefore this study is necessitated to provide comprehensive solution to the problems of Dairy cattle feeds and feeding of Jimma Town Cooperative Milk Producers Union through the following objectives.

Objectives

- ✓ To prepare and demonstrate on urea treatment of Teff straw
- ✓ To develop and demonstrated selected fresh forage legume and grass crops
- ✓ To enhance skills and knowledge of union members on forage production, straw treatment and how to feed their dairy cattle.

MATERIALS AND METHODOLOGY

Area Description

This study was conducted at Jimma town, located 346 km Southwest of Addis Ababa at about 7° 33' N latitude and 36° 57' E longitudes and at an altitude of 1700 meters above sea level. The mean maximum and minimum temperature of the study area is 26.8 °C and 11.4 °C, respectively and the mean maximum and minimum relative humidity was 91.4% and 39.92% respectively. The mean annual rainfall of the area is 1500mm (BPEDORS, 2000).

Specifically, the activity was carried out at “Jimma town Cooperative Milk Producers Union” which is located at Seto Semero, Jimma town. The union was established in 1998, with 22 members. Now, the union has 55 members among this 24 of them are females. This union has 300 dairy cows and they feed them hay, frushka and small cereals straw and produce 750

Challenge and Comprehensive Approaches to Improve Dairy Cattle Production and Promotion; The Case of Jimma Town Milk Producers Union

liter milk per day which is about 3liter per cow per day.

Procedures and Methodology of the Work

Questioners have been developed and 25 members of the union were interviewed. Based on the response of the members, problem is ranked.

Urea Treatment of Teff Straw

Sodium hydroxide and ammonia are among the more successful chemicals used to improve

nutritive value of crop residues like cereals or grass straw (Greenhalgh, 1984).

In the case of the teff straw treated with UREA, 1 metric cube pit was prepared and 5meter plastic sheet was laid on it, then 50kg of straw was treated with 2 kg of UREA dissolved in 40litter of water.

Finally it was packed with polyethylene sheet and kept for three weeks with soil and stone laid on top of it to provide anaerobic condition (fig. 1).



Figure1. Urea treatment of teff straw (where:-A: a strawafter treatment B: before treatment)

Fresh Fodder Plantation and Field Management

For each fodders plantation different activities such as, site selection, land clearing, planting material and seed preparation, ploughing and digging, layout, planting, watering, weeding etc. were carried out on 10 x 17 meter square area as per the recommended for each forage crops.

Elephant Grass

It can grow in almost any soil but does best in deep, fertile, well-drained soils. Cane cuttings

with three to four nodes and buds from the middle part of the cane were used for propagation or planting. Cuttings were planted on 10 X 10 meter square plot of land at an angle of 45 degrees with a spacing of 0.5 m between plants and 0.5 m between rows. After planting, all the recommended management practices for the grass were done. Finally had awareness creation was given to the union members to harvest from 3 to 4 months after planting, when the elephant grass is about one meter high by cutting the plant to about 10 to 15 cm from the ground.

For vetch and alfalfa plantation, the given land was ploughed till the land smoothed. Report of (Ugur *et al.*, 2013) recommended that sowing of vetch is done using from 80-100 kg/ha and hence 0.18 kg of vetch was applied for the area allotted. Finally, manual sowing (drilling) was applied with a row spacing of 30cm. in case of

alfalfa; seed was sown with seeding rate of 5 to 7.5 kg per hectare. Then the seeds were sown by drilling with a spacing of 30cm between rows and covered to a depth of approximately 0.6 cm. Sesbaniasesban was also planted based on its recommendations (fig.2).



Figure2. Fresh fodder field plantation

RESULT AND DISCUSSION

As explained before, the Union has been faced with the problems of dairy cow feeds while producing milk and milk products in the town. Consequently, the union supplies unsatisfactory milk product to the community, due to poor quality and low quantity of feed for the cows. As a solution, many activities as a part of the project was done and the result of each activity was observed as below.

Urea Treatment of Teff Straw

The treated Teff straw with UREA has observed after three weeks. Accordingly, the expected result has achieved. That is the straw has changed to yellowish in color, odor of local areke and moisted soft texture as compared to

original straw. These changes were practically shown, touched and smelled for the trainee, for coordinators and for visitors. The cost of feeding is a major part of total cost of milk production (Singh *et al.*, 1993), and hence reduction of feeding cost of dairy cows is a major concern. The cost of concentrate is high compared with straw and fresh forage.

In a feeding trial conducted using lactating crossbred cows in Ethiopia, urea treated barley or teff straw were suggested to replace native hay, and ammoniation was found to be economically feasible producing about 6.2 kg milk/ day for teff (Rehrahie, 2001). In the case of this activity, the cost of urea treated straws has considered to be economically feasible as compared to concentrate feeds.



Figure3. Union member's dairy cattle

Fresh Fodder Plantation

As raised by the union members, there was a problem of fodder which has high value and yield within a small plot of land. So, to solve this problem plantation of different fodder plants had carried out for the sake of demonstration. These includes, grassy fodder

like Elephant grass, and legume fodder such as vetch, alfalfa and Sesbaniasesban had planted, emerged and well grown each on separate plot.

Awareness Creation for Union Members

It is true that a balanced ration or improved fodder provides protein, energy, minerals and

Challenge and Comprehensive Approaches to Improve Dairy Cattle Production and Promotion; The Case of Jimma Town Milk Producers Union

vitamins which enable the animal to perform optimally, productive and remain healthy (Indian Livestock Census, 2007). Nonetheless, the milk producers have no all the necessary skills and knowledge on how to prepare/develop and feed improved feed, like fresh forages, and urea treatment of straw using locally available inputs.

Therefore, to fill such a gap this project has been intended to build awareness of scientific experiences on all the packages of improved forage production systems to the union members to be adopted and easily understood as well as for their future scale up of those practices. Bearing in mind this fact members of the union

were called for both theoretical and practical training on development of fresh forages like Elephant grass, vetch, alfalfa and Sesbaniasesban including on how to plant, manage and feed to their dairy cows. Additionally, training was given to the union members on how to improve nutritional value of locally available poor straw with UREA treatment. As a result, the recommended ratio of teff straw, UREA and water to be required had practically prepared and treated with full participation of the union members. Furthermore, proper time of fermentation and amount of treated straw to be given for one dairy cattle had been thought.



Figure4. During training

The training was well participatory and during discussion part of the program the union members commented that “there was no such a kind of formal training with the support of practical demonstration before, but now we have got tangible practical knowledge from this training”.

Besides to training the manual which detect stepwise procedures was prepared with both Amharic and Oromifa language was given to the trainees as a support for their subsequent practical work (fig.4).

Product Promotion and Field Visit

For the sake of the dairy milk product promotion T-shirts which have information like

photo of dairy cattle, name and address of the union was prepared. Promotion was done with wearing the T-shirts by group members though circulating Jimma town (fig.5).

At the end of this work, there was a field visit program and transfer of the activities to the end users with the participation of the union members and other invited guests. During the program, the procedures that have followed as well as the activities that have carried out for each activity were clearly briefed to the participants. Finally, the field demonstration work was transferred to the users to be continued and scaled up by them (fig.5).



Figure5. Promotion and field visit

SUMMARY AND CONCLUSION

Despite livestock production plays a considerably role to the national economy and the livelihood of the people in Ethiopia, yet, its productivity is extremely low in terms of milk, and meat production primarily due to direct and indirect impact of poor quality and insufficient feed. Several studies have been conducted on fodder production and use in Ethiopia, both by national and international research organizations. The major feed resources in the country are crop residues and natural pasture, with agro-industrial by-products and manufactured feed contributing much less. Developing improved fresh fodders and advancing nutritive value of crop residues like cereals or grass straw with urea treatment are vital for an increment of economically feasible dairy milk productivity. However, most of dairy milk producers do not have indispensable skills and information concerning to prepare improved feeds and feeding systems. This gap can be solved through the adoption and transfer of scientific knowledge and practice to the dairy milk producers. For the current study, the training

includes, giving information with demonstration on those sources of balanced rations such as elephant grass, vetch, alfalfa, Sesbania sesban from fresh fodders and also UREA treatment of cereal straw to improve its protein content.

In general improved dairy feed have a direct relation with milk production. Hence, producers should have know-how about the production and quality of dairy cow feed and feeding systems for the stability of milk production. Otherwise, milk supply to the increased population in the country will be continued with substandard manner. From this research, fresh fodder technologies and UREA treated straw were demonstrated to the union members with the support of theoretical and practical trainings for each forage technologies.

REFERENCE

- [1] Berhanu, G. Adane, H. And Kahsay, B. 2009. Feed Marketing In Ethiopia: Results Of Rapid Market Appraisal
- [2] BPEDORS. 2000. Physical and Socio-Economical Profile of 180 District of Oromia Region, Ethiopia

Challenge and Comprehensive Approaches to Improve Dairy Cattle Production and Promotion; The Case of Jimma Town Milk Producers Union

- [3] Garg, M.R. 2012. Balanced Feeding For Improving Livestock Productivity, Increase In Milk Production And Nutrient Use Efficiency And Decrease In Methane Emission. FAO Animal Production And Health Paper No. 173. Rome, Italy.
- [4] Greenhalgh JFD(1984).upgrading crops and agricultural by products for animal production , INHerbivore nutrition in sub tropcs and tropcs,eds FMC Gilchrist and RI Mackie .science press crarghell, S.Africa.
- [5] Moa and ILRI. 2013. *Animal Production Vision and Strategy for Ethiopia*. Addis Ababa, Ethiopia: Ministry of Agriculture and International Livestock Research Institute.
- [6] Montiel, F; Galina, C S; Lamothe, C; Castañeda, O., 2007. Effect of a feed supplementation during the mid-lactating period on body condition, milk yield, metabolic profile and pregnancy rate of grazing dual-purpose cows in the Mexican humid tropic Archivos de Medicina Veterinaria, vol. 39, pp. 207-213.
- [7] Pandey, G. S. And. Voskuil, G.C.J 2011. Manual on Improved Feeding of Dairy Cattle by Smallholder Farmers.
- [8] pimentel, P. G.; Pereira, E. S.; Queiroz, A. C. de; Mizubuti, I. Y.; Regadas Filho, J. G. L.; Maia, I. S. G.,, 2011. Intake, apparent nutrient digestibility and ingestive behavior of sheep fed cashew nut meal. Rev. Bras. Zootec., 40(5): 1128-1133
- [9] Reherahie Mesfin (2001). Biological and Economical Evaluation of Urea Treated Teff and Barley Straw Based Diets to Crossbred Dairy Cows in the Highlands of Ethiopia. Swedish University. Uppsala, Sweden. Msc Thesis. pp. 1-12.
- [10] Singh, B.; Narang, M. P., 1993. Indigestible cell wall fractions in relation to lignin content of various forages. Indian J. Anim. Sci., 63 (2): 196-200.
- [11] Ugur., 2013. Variation and correlation of morpho-agronomic traits and biochemical contents (protein and á-odap) in turkish grass pea (*lathyrussativus* l.) landraces, Turkey

Citation: Masreshaw Yirga et al, "Challenge and Comprehensive Approaches to Improve Dairy Cattle Production and Promotion; The Case of Jimma Town Milk Producers Union", *International Journal of Research Studies in Science, Engineering and Technology*. 2020; 7(10): 26-32.

Copyright: © 2020 Masreshaw Yirga et al, This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.