

Full Length Research Paper

An observational and questionnaire based study on principles of herd health management on Jimma University dairy farms

Semayat Oyda^{1*} and Teferi Mandado²

¹Department of Veterinary Epidemiology and Public Health, Wolaita Sodo University School of Veterinary, Southern Ethiopia.

²Department of Livestock and Fishery Resources, Dawuro Zone, Southern Ethiopia.

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The study was in Jimma University dairy farm with objective to assess the dairy management aspects of Jimma University dairy farm and to identify the herd health problems of the dairy farm. Ethiopia has a large number of livestock populations and holds the 1st rank in Africa. Despite the huge number of cattle and their economic importance, the productivity is low due to constraints of disease, nutrition, poor management, lack of marketing facilities and opportunity, inadequate animal health services, uncoordinated development programs between various levels of government institutions. Both questionnaire and observational survey study was conducted on Jimma University dairy farm which have total of 45 animal populations (calf 16, heifer 15, bull 1, milking cow 12, and dry cow 1) found in Jimma University dairy farm. Observational study type conducted and the total animal populations in the dairy farm are observed by using census sampling method and the questionnaire developed for this purpose is filled with the information obtained from the close dairy attendants. Close observation considering animal welfare, house, management, feeding and watering and questionnaire survey was collected regarding health management, back ground history, productivity, and other related issues. After observation and questioner collection and the results from dairy farm obtained were compared with scientific standards of dairy herd health management and production. Dairy farm has been facing low prevalence of mastitis, lameness, calf diarrhea, bloating and external parasite density. The house has no separate rooms for different status of cows and calves and lacks proper waste disposal systems. In conclusion, the farm has many constraints that have to be improved for next.

Key words: Dairy farm, herd health, disease, management, university.

INTRODUCTION

Ethiopia has a large livestock population, a relatively favorable climate for improved, but the products and productivities were very low compared with their number.

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*Corresponding author. E-mail: E-mail: semayatoy79@gmail.com. Tel: +251926089330.

interventions to the dairy sector will contribute to poverty alleviation in the country by increasing the income of smallholder dairy producers and creating employment and transforming the existing largely subsistent type of milk production to commercial level (Zelalem et al., 2011). Industry has even greater potential for improving the living standards of people through improved nutrition arising from milk consumption and incomes raised from sales of milk and milk products (Njombe, 2011).

Despite the huge number of cattle and their economic importance, the productivity is low due to the constraints of disease, nutrition, poor management, lack of marketing facilities and opportunity, inadequate animal health services, and poor performance of indigenous breeds (DACA, 2006). The implementation of an integrative program of herd health and production management in dairy cows requires monitoring a large category of data, general status of the animals, clinical examination, para-clinical examinations (ultrasound, blood and urine biochemistry, bacteriological, virological, serological), reproduction parameters, housing conditions, nutrition, milk production and its quality, veterinary actions and their results (Solcan et al., 2005).

Among the major reproductive problems that have direct impact on reproductive performance of dairy cows are abortion, dystocia, retained fetal membrane, pyometra, metritis, prolapse (uterine and vaginal), anoestrus and repeat breeder. They are classified as before gestation (anoestrous and repeat breeding), during gestation (abortion, vagina prolapsed and dystocia) and after gestation (retained fetal membrane and uterine prolapsed) (Lobago et al., 2006; Shiferaw et al., 2005).

Infectious diseases can have a great impact on the economic performance of a farm and may also induce stress in the farmer and image of the dairy industry, including damage to public image, loss of market position and decreased slaughter value (Noordhuizen, 2012). Feed shortage is partly attributed to the shortage of land for forage development. The absence of or weak linkages among the different actors in the dairy value chain is considered to be another important factor that negatively affects the country's dairy development (Zelalem et al., 2011). Based on the above literature, Jimma University dairy farm is one of farm found in Jimma University that provide milk for college community, students for practice and for research purpose. To cross presence or absence of challenges in Jimma University dairy farm that are commonly facing dairy production in general, we come with the following objectives:

- (i) To address the dairy management aspects of Jimma University dairy farm
- (ii) To identify the herd health problems of the dairy farm and
- (iii) To forward general recommendations based on observations

Characteristics of smallholder dairy cattle production systems

Smallholder dairy farming is an important part of farming throughout developing countries. Smallholder dairy farmers follow three main feeding systems for cattle rearing which are zero grazing (intensive), partial grazing (semi-intensive) and free range (extensive) (Msuya, 2002). Zero grazing is also used as a means to control communicable diseases by isolating crossbred and exotic cattle from the indigenous cattle (Reis and Combs, 2000). However, zero grazing can contribute to poor animal productivity due to a number of factors: failure to feed cattle during the night is often encountered in zero grazed animals, which is undesirable since stall-fed milking cows need night feeding like grazing animals (Phiri, 2001).

Smallholder farmers have the common characteristics of limited resources and income, their farming systems and culture differ widely from place to place. Farmers own mostly between one and five zero grazed dairy cattle (Kurwijila and Boki, 2003).

Generally, factors constraining performance of dairy industry include; inadequate feeding of dairy cattle for high production, inadequate control of epidemic diseases, unreliable supply of inputs and shortage of skilled labor for good management (Msechu et al., 1995). According to Mwatawala et al. (2003), problems of long calving interval (CI), short lactation length (LL) and long dry period (DP) could be reduced through improvement in management than manipulation of genetic constitution of the animals.

METHODOLOGY

Description of the study area

Observational and questionnaire survey study were conducted in Jimma University dairy farm, Southwestern part of Ethiopia. Jimma University is located in Oromia Regional state, 346 km Southwest of Addis Ababa at latitude of about 7013'-8056' N and longitude of about 35052'-37037' E, and at an elevation ranging from 880 to 3360 m above sea level. Observational study area receives a mean annual rainfall of about 1530 mm which comes from the long and short rainy seasons. The annual mean minimum and maximum temperature during the study period were 14.4 and 26.7°C respectively (JUDF, 2017/2018).

Study type and study population

Both questionnaire and observational survey was conducted on dairy farm from February to October 2017 at Jimma University farm (a total of 45 animal populations (calf 16, heifer 15, bull 1, milking cow 12, and dry cow 11)) found in Jimma University.

Sample size and sampling method

Observational study type conducted and the total animal populations in the dairy farm (45) are observed by using census sampling method and the questionnaire developed for this purpose is filled with the information obtained from the close dairy attendants.

Study methodology

Close observation considering animal welfare, house, management, feeding and watering and questionnaire survey was collected regarding health management, back ground history, productivity, and other related issues. After observation and questioner collection and the results from dairy farm obtained were compared with

scientific standards of dairy herd health management and production. No laboratory work was conducted to differentiate health problems in farm but questionnaire surveys for interviewees have tried to approve their occurrences.

RESULTS AND DISCUSSION

Observational study

Total of 45 animals (12 milking cows, 1 dry cow, 1 bull, 15 heifers, 16 calves) observed under observation and questionnaire survey.

Housing

The house of university dairy farm was constructed with ventilation, urinary disposal canal, feeding and watering canal, delivery pen, calf pen, group heifer pen, milk dispatch room, office, feed store and etc. This house construction with above component is good, even though it has its own constraints. Some of them are the followings:

- (i) The house has no proper waste disposal system. Animal urine and feces are storing on the floor and contaminate animals and their feeds.
- (ii) There are no separate rooms for delivery, milking, calves, and there is no proper ventilation.
- (iii) Two directions of the openings of house relative to west and east.
- (iv) Feed is stored with other materials which are the source of contamination for dairy cows and there is no separate room for dairy and poultry feeds.

Herd management and sanitation

University dairy farm is currently well managed as compared to previous management system. The dairy cows and floor are washed with water and soap three times a week, each dairy cow udder has cleaned by separate towel, milking system is good in that if there is diseased cow with mastitis, the healthy cows are milked first, from diseased cow healthy udder milked first and followed by diseased udder last. The pregnant cow after eight month she separated to parturition pen. After parturition with in 24 h the calf was separated from mother and get in calf pen. The calf feed 2 L of milk twice a day. When the calf start feeding forage and supplementary feed, the milk allowed to calf is decreasing. Dairy cow feed twice a day concentrate feed (morning and afternoon during milking) and forage feed allowed 2-3 times a day. Concentrated feed and water are given to cows in feeding and watering trough. However, the management system of university dairy farm are facing the following challenges:

- (i) The floor has no proper manure and urine disposal canals till; this contaminates feeds, animal udder and

equipment

- (ii) Forage feeding to animal directly come from the site which has some source of contamination and diseases.
- (iii) Concentrated feed contaminated with wastes from animals and equipment
- (iv) The concentrated feed allowed to cow is not measured enough
- (v) There is no separate room for diseased animals.

Herd health management

In the dairy farm; the frequently recorded diseases and management problems include carbohydrate engorgement, lameness, mastitis, calf scour, diarrhea, decreased production etc. Lameness prevalence is lowered in its occurrence due to the change in sanitation of the house and general follow up of the dairy cattle for the diseases and sudden trauma. Carbohydrate engorgement is reduced to a manageable level because of the practice of animal feeding management to an acceptable level. The cows' udder washed with clean water and soap, and then dried with clean towel. Mastitis have been managed in a way of keeping good milking orders of health cows milked first followed by mastitis cow health udder and then finally the mastitis udder. Calf scour and production reduction are managed when faced the farm report to Jimma University for technical support. The school gives a sudden technical support immediately to the problem on the farm. In general, university dairy farm has the following weak sides to be considered:

- (i) Concentrate feeds have no separate store from poultry feeds and equipments
- (ii) Concentrate feed allowed to the dairy milking cow is not measured
- (iii) Even though the floor is washed three times a week; there is a couple of contamination to the animal feed and water and equipment.
- (iv) Whatever they care for the mastitis; there is no more attentions given to subclinical mastitis and environmental contamination to the udder and whole animal body. Feeding and watering troughs are not as hygienic as they required being.

Results of questionnaire survey

As it was indicated below that total number of 15 dairy farm laborers were interviewed from the total of 20 labors and 15 semi-structured questionnaires each has about 18 questions were distributed to get information concerning the diseases common to the dairy farm, the feeding and watering system, housing and feed storage system, the sanitations and general herd health management system. Then after the questionnaires were filled by the interviewers, they were picked and the responses to each question were evaluated and ranked according to Table 1

Table 1. Demographic characteristic of interviewers.

Questionnaires	Variables/responses	No. of respondents	Percentage
Sex of labor	Male	9	60
	Female	6	40
Marital status of labor	Single	4	26.7
	Married	11	73.3
Educational status of labor force	Illiteracy man	1	6.67
	Elementary	5	33.33
	Certificate	3	20
	Diploma	3	20
	First Degree	4	26.67

Table 2. Farm characteristics.

About farms	Variables	No. of respondents	Percentage
No. of dairy cows in farm	10-15	12	80
	16-21	1	6.7
	22-27	1	6.7
	28-33	1	6.7
	Above 34 cows	0	0
Total number of milking cows	10 – 14	12	80
	15 – 19	2	13.33
	20 - 24	1	6.67
No of dry cows in farm	1	0	73.33
	2	1	6.67
	3	3	20
	4	11	73.33

and compared to the results obtained by the observational study of the same period, study population and place. As it was indicated in Table 1, demographic characteristics of interviewers showed that labor worker of the farm was dominated by males 9(60%) and educational status of the worker was mostly by elementary 5(33.33%). The farm consisted of 12 (80%) dairy cows in the farm, about 12(80%) was milking cows and 11(73.33%) number of dry cows in the farm as the respondents responded as indicated in Table 2.

Feeding management

Most dairy cows were feed in zero grazing (10(66.67%) in the farm system (Charles et al., 2015). Tethering and stalling feed and grazing were also important types of feeding in the farm. Animal feed was mainly sourced on

the farms from natural sources. The farmers employed a farm worker who collected feed from various sources including field and other communal lands (Table 3). In Table 4, house of the farm was constructed by modern systems (concreted floor) 10(66.67%) as responded by interviewee, but some of the respondents stated that house was constructed by semi-modern system 4(26.67%). This result agrees with the result of Charles et al. (2015) and MoLD (2007).

CONCLUSION AND RECOMMENDATIONS

Both observational and questionnaire survey study were carried out in Jimma University dairy farm which is found Southwestern part of Ethiopia. The study was conducted with objective of addressing herd health problems and dairy management aspects in Jimma University. Close

Table 3. Feeding systems.

Feed systems for farm	Variable	No. of Respondents	Percentage
Feeding system of the farm	Communal grazing land	1	6.67
	Tethering	2	13.33
	Private grazing land	0	0
	Stall feeding and grazing	2	13.33
	Zero grazing	10	66.67
Feeding source to the farm	Local/natural grass	8	53.33
	Silage	2	13.33
	Hay	3	20
	Concentrates	1	6.67
	Other	1	1.67
Source of concentrate feed for farm	Local area	1	6.67
	Market	11	73.33
	Manually prepared	3	20
Feeding related challenges	Feed shortage	9	60
	Food poisoning	2	13.33
	Food contamination	4	26.67

Table 4. Management activities and systems.

Management	Variables	No. of respondent	Percentage
Housing systems of dairy cow	Traditional	0	0
	Semi-traditional	1	6.67
	Semi-modern	4	26.66
	Modern/concreted floor	10	66.67
Frequency of cleaning of dairy cows and floor per week	Not at all	0	0
	Once a week	0	0
	Twice a week	1	6.67
	Three times a week	13	86.66
	Four times a week	1	6.67
Practical milking order	Yes	14	93.33
	No any order	0	0
	Sometimes	1	6.67
	Less important	0	0
	I do not know	0	0
Feed supply to dry and milking cows share equally	No	13	86.66
	Yes	1	6.67
	Not known	0	0
	Sometimes	0	0
	I do not know	1	6.67
House construction has waste disposal canal	Yes	2	13.33
	No	12	80
	I Do not Know	1	6.67

Table 4. Contd.

Diseased separated from health animals	Yes	2	13.33
	No	13	86.67
Common diseases in dairy farm	Carbohydrate engorgement	6	40
	Diarrhea	6	40
	Calf scour	1	6.67
	Mastitis	2	13.33

observation considering animal welfare, house, management, feeding and watering and questionnaire survey was collected regarding health management, back ground history, productivity, and other related issues. After observation and questioner collection and the results from dairy farm obtained were compared with scientific standards of dairy herd health management and production. The house of university dairy farm was constructed with ventilation, urinary disposal canal, feeding and watering canal, delivery pen, calf pen, group heifer pen, milk dispatch room, office and feed store. Known and very visible weakness of the farm was poor waste disposal system and lack of separate rooms for delivery, milking, calves.

The current status of dairy farm is well managed as compared to previous management system. That is after parturition within 24 h the calf was separated from mother and get in calf pen. Major management problems in the farm recorded was diseases (lameness) and other management problems or feeding problem (carbohydrate engorgement, lameness, mastitis, calf scour, diarrhea, decreased production). On the basis of the above conclusion; the followings are recommended:

- (i) Improving the use of pasture through appropriate grazing land management systems
- (ii) Lactating cows, dry cows and suckling calves are supplemented with concentrates with measurement
- (iii) To improve the frequency of mastitis and lameness, more standard way of milking and special consideration should be given to environmental hygiene
- (iv) The house of the dairy has to have proper waste disposal system that minimize contamination of environment and the dairy cows.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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