

Comparative analysis of different factors involving management status of dairy farms in Khartoum state (Sudan)

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Abstract

A study on breed, milk yield and processing, health condition, human resource, hygiene program, nutrition and building status was carried out in dairy farms at Khartoum, Khartoum North and Omdurman located in Khartoum state. Data were collected from 120 farms (40 farms from each town) in the study area. The information was collected by questionnaire, direct interview with farm owners and personal observation. The results showed significant difference in type of breeds, milk yield, vaccination programme and prevalence of mastitis. General hygiene and sanitation measures such as dung removal, disinfection, cleaning program and maintaining minimum contamination during milk process could not be observed in the majority the farms.

Key words: Breeds, Farm, Hygiene, Milk Yield, Building

Introduction

Abdullah, (1995) reported that there are two major system of milk production in Sudan, traditional grazing in Western, central and Southern Sudan and modern sector around cities and urban centers. Williamson and Payne, 1978) suggested at least three types of dairy management in the tropics, with the subsistence producer being dominant with low and poor standard of management, the specialized dairy farmers with relatively small farms and management skills are not usually very high, and the third is the large scale dairy farms, which are very few and possess high intensive well managed farms.

Mahboba (2006) indicated that in Sudan, most of important milk producing areas have no rigid systems of inspection on the farms and are not complying with sanitary standards, subsequently most of the products of these farms are sold through vendors and groceries. Thus, there is a need for recent sound information based on scientific data on the health composition and safety measures of milk.

The objectives of this study to different factors practiced in the dairy farms of Khartoum State of Sudan.

Materials and Methods

This study was carried out during 2009-2011 in Khartoum state dairy farms. The farms were distributed around the three cities (Khartoum, Khartoum North and Omdurman). In this study, 120 dairy farms (40 farms from each town) were selected for the study. A questionnaire was filled at each selected dairy farms to find answers on the following questions:

- Type of breeds.
- Milk yield and process.
- Health condition.
- Human resources in the farms.
- Hygiene program in the three farms studied.
- Nutrition application.
- Building conditions

Statistical Analysis

The collected data was subjected to statistical analysis program, SPSS. Analysis of variance (ANOVA) was used to find out the significant difference between the three areas.

Results

120 herds were studied for the distribution of the type of cattle breeds during the present survey in the three big areas of Khartoum state Table (1). Omdurman was found to contain the highest number of cross cows in all farms that included in this study (97.5%). In Khartoum farms and Khartoum North, 92.5% were composed of cross cows. The rest (7.5%) were composed of Kenana breed in Khartoum, the least percent (2.5%) are Friesian in Khartoum North, but it was not found in Omdurman and Khartoum. The values indicated higher significant differences ($P<0.001$) between the three areas for the type of result.

Table 1: Breed wise distribution of cows in Khartoum state

Breeds	Localities			P value
	Khartoum	Khartoum North	Omdurman	
Cross	92.5	92.5	97.5	0.001
Kenana	7.5	5	2.5	
Friesian	0	2.5	0	

The highest percentage of yield was found in Omdurman (80%) followed by Khartoum (42.5%) and Khartoum North (32.5%) which was significant ($P<0.001$) between the three areas (Table 2). However, there were non significant variations ($P>0.05$) between the farms regarding milking procedures. In all areas hand milking was found to be the common practice of milking the cows. Transportation of milk was either conducted by Karo or normal vehicle. The values indicated non significant differences ($P>0.05$) between the three areas. In Khartoum, 5% of the farmer used aluminium containers, while 95% used plastic. Furthermore in Khartoum North 97.5% of the farms used aluminium containers and 2.5% plastic. On the other hand farmer in Omdurman used 97.5% aluminium and 2.5% plastic containers. Moreover, storage of milk was done at room temperature in Khartoum and Khartoum North, but only 2.5% at refrigerator temperature in Omdurman.

Table 3 indicates that the applied vaccination program used in high percentages in some of the farms in Khartoum and Omdurman using safety measures (85%). Usage of vaccine for emergency was 22.5% in Khartoum, 7.5% in Khartoum North and 12.5% in Omdurman. Moreover spread of diseases (foot and mouse disease, bloat, internal and external parasites) in the areas was the same in the all farms but mastitis prevailed with significant difference ($P<0.05$).

Table 4 shows the veterinarians visit to the farms on daily basis (77.5%) in Khartoum North and Omdurman or weekly in Khartoum. Similarly

permanent workers were found in Khartoum North (87.5%) or temporary in Omdurman (42.5%). The values indicated non significant differences ($P>0.05$) between the three areas.

Table 5 denotes hygiene and preventive measures including detergents, sanitation and disposal of wastes from the farms. Khartoum farms seem to use higher detergents (7.5%) at the farms followed by Khartoum North (5%) but not used in Omdurman farms. On the other hand sanitation and cleaning of equipment was used in higher percentages in Omdurman farms (82.5%). Moreover, only 2.5% of the farms in Khartoum dispose the waste daily, but weekly disposal of waste was 67.5% in Omdurman farms and 55% farms in Khartoum and Khartoum North. It was found that practice of disposal of waste from the farms performed each 3-4 days was 42.5% in Khartoum, 45% in Khartoum North and 32.5% in Omdurman. These values revealed non significant differences ($P>0.05$) between the areas.

Table 6 provides water supply means used by farmers in different areas of the three cities. Pipes seemed to be used in most of the farms in the study areas, but donkey is being used only in Omdurman (32.5%). On the other hand most of the farms feed their herds concentrates and green fodders (Abuo70 and Berseem). Table (7) shows the nature of fences used around the grazing areas.

Discussion

Cross breed cows represent the highest number (97.5%) among the breeds in the farms located at Omdurman (Table 1). This indicated that cross breed cows were best adapted and predominated in the farms of Khartoum state (Mohamed, 1995). Moreover, this finding is supported by Tibin, et al. (1990) who found 67.2% of the herd was grade cattle, 27.8% were local type and 4.9% constituted others types.

As shown in this study, machine milking was not used in all farms at Khartoum state, while the rest of the farms used hand milking. This agreed with Berrett and Larkin (1974) who reported that machine milking was not widely used in the tropics and often cows dry off themselves. Similarly, Williamson and Payne (1978) mentioned that the using of modern technologies as milking machines in small holders dairy farms are completely uneconomical and indeed undesirable because of surplus labours.

The present data also showed that storage room for forage was absent in most of the farms in Khartoum. The present feeding system beside pens might be the cause and source of contamination of raw milk with bacteria (Vaerewijek, et al. 2001). Various illegal milk containers for milking and transporting the milk

Table 2: Milk production and processing in some dairy farms in Khartoum state

Variable	Sub-variables	Percentages in area%			P value
		Khartoum	Khartoum North	Omdurman	
Yield (Liters)	50 -100	30	32.5	12.5	0.05
	100 -150	42.5	35	7.5	
	More than 150	27.5	32.5	80	
Milking techniques	Hand milk	100	100	100	NS
	Machine milk	0	0	0	
Milk containers	Aluminum	95	97.5	97.5	NS
	Plastic	5	2.5	2.5	
Transportation	No vehicle	10	5	15	NS
	Normal vehicle	47.5	42.5	15	
	Cooling vehicle	0	0	0	
	Karo	42.5	52.5	70	
Proceeding of marketing	In farm	37.5	30	40	NS
	In house	0	0	2.5	
	In market	0	0	15	
	Through agent	62.5	70	42.5	
Storage of milk	Refrigeration	0	0	2.5	NS
	In room temperature	100	100	97.5	

NS: Non significant

Table 3: prevalence of different diseases and vaccination programme in Khartoum state

Variables	Sub-variables	Percentages in cities			P value
		Khartoum	Khartoum North	Omdurman	
Vaccination	Safety measure	75	85	85	0.05
	Control	2.5	5	2.5	
	Emergency	22.5	7.5	12.5	
Mastitis	Less than 5	55	52.5	70	0.05
	5-10	47.5	25	15	
	More than 10	0	10	7.5	
	Other	0	12.5	7.5	
Foot and mouse disease	Less than 5	52.5	77.5	77.5	NS
	5 –10	47.5	7.5	2.5	
	More than 10	0	5	0	
	Other	0	10	20	
Bloat	Less than 5	45	57.5	40	NS
	5 –10	40	22.5	20	
	More than10	10	10	5	
	Other	5	10	35	
Internal parasites	Less than 5	50	55	50	NS
	5 –10	27.5	22.5	20	
	More than 10	20	15	2.5	
	Other	2.5	7.5	27.5	
External parasites	Less than 5	27.5	25	37.5	NS
	5 –10	45	32.5	27.5	
	More than 10	25	35	32.5	
	Other	2.5	7.5	2.5	
Health measures	Applied	92.5	65	70	NS
	Non applied	7.5	35	30	

NS: non significant

Table (4): Human resource in some dairy farms at Khartoum state

Variables	Sub-variables	Percentage in different areas			P value
		Khartoum	Khartoum North	Omdurman	
Veterinary visit	Daily	72.5	77.5	77.5	NS
	Weekly	27.5	22.5	22.5	
Milk men	Permanent	77.5	87.5	57.5	NS
	Temporary	22.5	12.5	42.5	

NS: non significant

Table 5: General hygienic in some dairy farms at Khartoum state

Variables	Sub-variables	Percentages in different areas			P value
		Khartoum	Khartoum North	Omdurman	
Detergent	Applied	7.5	5	0	NS
	Non applied	92.5	95	100	
Clean of equipments	Very good	2.5	0	5	NS
	Good	60	80	82.5	
	Bad	37.5	20	12.5	
disposal of farm waste	Daily	2.5	0	0	NS
	3-4 days	42.5	45	32.5	
	Weekly	55	55	67.5	

NS: Non significant.

Table (6): Source of water and feed supply and nature of feed in different localities of Khartoum state

Variables	Sub-variables	Percentages in different areas			P value
		Khartoum	Khartoum North	Omdurman	
Water supply	Net work (pipe)	92.5	97.5	65	NS
	Well	7.5	2.5	2.5	
	Excavation	0	0	0	
Nature of feed	Donkey	0	0	32.5	NS
	Concentrate	65	85	90	
	Abou70	30	15	10	
Source of feed	Berseem	5	0	0	NS
	Company	7.5	2.5	5	
	Agent	12.5	12.5	10	
	Special farm	7.5	0	5	
	Local market	72.5	85	80	

NS: no significant

Table 7: Nature of fences around the grazing area in the three states of Khartoum

Variables	Sub-variables	Percentages in different areas			P value
		Khartoum	Khartoum North	Omdurman	
Pens	Pipes	7.5	0	0	NS
	Metal	55	60	65	
	Mud	37.5	40	35	

NS: Non Significant

were found to be commonly used among most of the farms (Table 2). However, Bramely and McKinnon (1984) reported that if cans are not effectively cleaned, it will result in high bacterial counts.

As shown in Table 3 vaccinations against contagious diseases such as anthrax, rinder pest and hemorrhagic septicemia were rarely used in the farms under study. Ibtisam (1995) reported that foot and mouse disease, mastitis, bloat, internal and external

parasites vaccines' were rarely used in the farms in Khartoum state. Moreover, the vaccination provided by veterinary authorities as governmental services practiced in the farms under study. This because of national interest to preserves livestock wealth of the country (Mohamed, 1995). This indicates improvement in veterinary services as reported by Baasher (1969) that since 1900, when the first time veterinary effort was made, disease prevention passed certain

developmental changes. The less foot and mouse disease vaccine were rarely used and that might be due to their higher cost as stated by Williamson and Payne (1978).

The results revealed that most milk men in the farms do not stay long which is in agreement with the findings reported by Abdel Mageed (1988) and Habiballa (1996) that such situation may have negative impact on the farms. In this study, it was noticed that many farms owners were using traditional treatment for mastitis and other diseases. Moreover, most of the farms applied drugs without veterinary instructions or inspections. So many health problems that might arise in those farms are due to the complete absence of veterinary supervision.

Many farms included in this study showed the lack of knowledge about quality and source of water. Since it was clear that about half of the farms (77.5%) in Khartoum North and 65% of farms in Omdurman used untreated ware supplies from bore holes and others sources. Some of these might be sources of contamination for milk with faecal organisms. According to some report water should not contain more than three faecal coliforms per 100 ml and not greater than 5 NTU (Nephelometric Turbidity Unit) for turbidity (NZDWS, 2000). However, Bramley and McKinnon (1984) claimed that the farms of water supply can be a source of microorganism (especially psychrotrophs) that can contaminate equipment and or the milk.

All farms exhibited intensive feeding system. Cows were hand milked and offered a concentrate ration during milking time which was done twice a day (morning and afternoon). The daily diet provided to animals in different locations was weighed and the average feed intake was calculated. On the other hand the owners practice traditional cultivation, since they restrict themselves to the cultivation of berseem (*Medicago sativa*) and Abu 70 (*Sorghum vulgate*) for feeding their animals. In summer months, the farmers feed Abu 70 with very small amount of berseem. However, in winter season they feed berseem and sorghum straw purchased from market.

Ideal building material was seldom used in dairy farms in this study. Badi (1988) in the reported that most of animal were kept in open areas or zaribas without shade (Gezira Scheme). Moreover, they were similar to the type of building which was described by Almagid (1988). He also mentioned that in Kuku dairy project, the farm buildings were poorly designed with no sufficient space for cows. Tjokrohoesodo and Gross (1975) reported that in Indonesia the dairy cattle housing depend mainly on the purpose and the wealth of the owner. However, the building design helps to reduce environmental stress and provides safe and hygienic conditions to raise the level of production and to cover the additional cost (Mohamed, 1995).

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