

Management and husbandry practices in some dairy farms in Khartoum state

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SUMMARY

The study involved dairy farms management and husbandry practices namely: herd size, herd structure, breed type, lactation performance and feeding policies of crossbred dairy cows at randomly selected dairy farms from different localities in Khartoum metropolitan area. The total number of cattle in 100 herds surveyed was 9145 heads with overall mean of 91.45 ± 107.43 heads / herd. The overall herd structure was: 37.86 % lactating cows, 7.14 % dry cows, 11.85 % replacement heifers and 33.15 % for the calves and bulls. Average daily milk yield per cow was 9.49 ± 3.0 kgs. The average lactation length was 269.85 ± 18.97 days while the average dry period was 42.84 ± 28.56 days.

Total amount of green fodder fed per cow / day was 11.0 ± 4.4 kg and the concentrated feed offered to a cow / day was 5.23 ± 1.54 kg for the milking herds.

INTRODUCTION

Khartoum state is located in the semi arid zone, and covers an area of over 20971 km², between latitude 15⁰ N and 16.45⁰ N and longitude 31⁰ E and 34.4⁰ E. Human population is 5.7 millions increasing annually at a rate of about 4.04 %. According to the annual report of the state Ministry of Agriculture, Animal resources and Irrigation (M. A.A.R.I 2005), estimated numbers of ruminants in Khartoum state are about 222,000 cattle, 445,000 sheep, 726,000 goats and 5500 camels, 68.5% of the cattle are actually contributing in the supply of liquid milk. The annual per capita consumption of milk in Khartoum state is estimated at about 81.5 liters, which means that the need for fresh liquid milk can amount to 465.000 tons.

The objective of this study is to envisage a descriptive road map for some of the management practices adopted in Khartoum state to highlight the problems; this extends to suggest some solutions to the constraint facing the development of the dairy sector in Khartoum state.

MATERIALS AND METHODS

Herds Locations:-

The present research assignment was conducted during the summer season 2004 (March to October) in selected farms in Khartoum state. Hundred milking herds of varying sizes adopting traditional management system were chosen to cover the three localities affiliated to Khartoum state in the locality of Khartoum. Herds from Soba, Geriaif, Lamab, Shagra, Buri, Azozab, Manashia, Dekhainat and Taiba were chosen. In Khartoum north locality herds from Kuku, Mygoma, Samrab, Halfaya, Kadro, Kafori, Shambat, Gadissia and

Eltibna were targeted. From Omdurman locality herds located at Umbda, Karari and Elradowan were investigated.

These farms were chosen on basis of willingness of the herd owners to cooperate and release information needed by the researcher which were included in the extensive questionnaire

Field methods:-

Preliminary visits to selected farms indicated that the majority of them lacked records. Collection of data depended entirely on the extensive questionnaire prepared earlier, personal contacts and interviews of the farm owners through field visit to check the validity of the answers. Regular visits were made to the selected herds. In each herd the numbers of animals were counted several times and recorded according to breed (local or cross-bred), Animal age (young calves, heifer at different age; 1-3 years of yearling male calves) and production status (lactating cows, dry cows, breeding bulls and female heifers), daily feed intake (forage and concentrate) was recorded specifying the type and amount. The daily milk yield of cows in each herd and individual cow yield was measured fortnightly.

Statistical analysis:

Descriptive statistical analysis of the data collected was accomplished using Statistical Package for Social Science (SPSS) computer program to layout a descriptive map for the traditional dairy sector in Khartoum metropolitan area.

RESULTS

Table (1) shows herd size and structure in dairy farms in Khartoum state. It indicated big variations in cattle numbers at different farms which ranged between 22 –735 heads with a mean of 91.45 ± 107.43 heads / herd. The lactating cows comprised more than one third of the total herd (37.86 %), while the dry cows were about one sixth (17.14 %). Female calves were found in higher percentage than other stock (breeding bulls, and male calves). As a percentage from the total numbers of adult cows, lactating and dry cows were 68.8 % and 31.2 % respectively.

Table 1. Herd size and structure in dairy farms in Khartoum metropolitan area

Item	No of cows	Mean \pm SD	Range	Percentage
Total	9145	91.45 \pm 107.43	22 – 735	
Lactating cows	3462	34.62 \pm 46.38	7 – 300	37.86
Dry cows	1567	15.67 \pm 15.53	0 – 100	17.14
Heifers	1084	10.84 \pm 11.89	0 – 57	11.85
Breeding bulls	147	1.47 \pm 1.49	0 – 11	1.61
Female calves*	2232	22.32 \pm 34.58	3 – 250	24.41
Male calves**	653	6.53 \pm 7.86	0 – 56	7.14

* Female calves < 9 month

** Male calves < 6 month

Breed type:

Collected data revealed that all investigated farms owned crossbred dairy cows. However, levels of exotic blood could not be determined in these farms due to lack of records, in addition to that owners were not interested to identify the levels of crossing.

Feeds and feeding:

Type of feed and daily feed intake in Khartoum state shown in table (2). It was evident from the table that concentrate mixes were formulated from four major ingredients that included Sorghum grains (Dura), Wheat bran (WB), Groundnut hulls (GNH) and Molasses in addition to Salt licks. The data revealed that Wheat bran was the most widely used component in concentrate mixes, where 96 % of the farms utilized it. Groundnut hulls ranked second since 94 % of the farms incorporated it in the concentrate mix. 64 % of the farms used Sorghum grain and 48 % utilized molasses in the offered concentrate mix. On the other hand 62 % of the farms availed salt licks to their herds.

However the percentage inclusions of these ingredients were not identified because the farmers were reluctant to disseminate such information. The average daily consumption of the concentrate mix was about 5.23 \pm 1.45 Kg /cow/day irrespective of the milk yield of the cow.

The roughages were comprised mainly of Abu 70 (*Sorghum vulgare*) and Berseem (*Medicago sativa*). The average daily allowance was 11.0 \pm 4.4 Kg /cow.

Table (2). Feed components and daily consumption in surveyed farms.

Concentrate components	Roughage components
1- Sorghum Grain (Dura)	Abu70 (Sorghum vulgare)
2- Wheat Bran	Berseem (Medicago sativa)
3- Ground Nut Hulls	
4- Molasses	
5- Salt lick	
Daily consumption	Daily consumption
5.23 ± 1.54 Kg DM /cow	11.0 ± 404 Kg DM /cow

Lactation performance:

The lactation performance of the investigated herds is portrayed in table (3). The data showed that the mean total milk yield (TMY) was 337.04 ± 520.62 kg /herd. The average daily milk (AMY) / cow amounted to 9.49 ± 3.0 kg, the average lactation length (LL) in the studied herds lasted for 269.85 ± 18.97 days and the dry period (DP) averaged 42.84 ± 28.5 days. The data in table (3) also indicated that the average high lactating cow (HLC) produced 19.85 ± 6.49 kg / day, while on the other hand the low producing cow (L PC) yielded an average of 6.57 ± 2.79 kg.

Table (3). The Lactation performance particular of the studied herds

Variables	Mean \pm SD	Maximum	Minimum
Total milk yield / kg	337.04 ± 520.62	348.8	124
High lactating cow / kg	19.85 ± 6.49	35	4
Low lactating cow / kg	6.57 ± 2.79	16	1
Average milk yield / kg / day	9.49 ± 3.0	18	3
Lactation length / day	269.85 ± 18.97	300	190
Dry period / day	42.84 ± 28.56	150	10

DISCUSSION

Herd size:

From table (1), it was noticed that the overall mean herd size of the studied farms in Khartoum state was 91.45 ± 107.43 head per herd, which was less than 1339 and 2622 heads reported by Attia (1986) in two separate studies, and 529 and 281 heads stated by Atabani (1960). The herd size in the present study however was greater than the herd size reported by Tibin (1990) in Kuku Dairy Project and that of Mohammed (1995) and Habeeballa (1996) those authors reported 69.7 ± 53.5 , 82.5 ± 137 and 39.6 ± 20.7 as average

herd size respectively. These variations may be due to a variety of factors including the number of herds studied by the different authors, goals and objectives of studies, dates of surveys and sites and cooperation of stockowners and other unidentified factors.

Herd structure:

The lactating cows in this study represented 37.86 % of the herds structure, while the dry cows represented 17.14 %. These results differ from what was reported by Atabani (1960) in his study the dairy herds at Umbenien and Nisheisheiba Research Station were the milking cows at Umbenien were very low (12.5%) and the dry cows were 28.7 %, while in Nisheisheiba, the milking cows were 22.4 % and the dry cows were 24.2%. In this study the lactating cows represent 66.8 % of adult cows while the dry cows were 31.2 %. The present results comply with the 66% reported by Mohammed (1995). This might indicate an improvement in the management system. Badi (1988) in his study of dairy herd in Gezira Scheme reported that milking cows were 65.4 % of the total herd. The current results revealed that heifers represented 11.85 % of the total herd while calves represented 31.55%. Badi (1988) reported comparable data for heifers (12.8 %) but different percent for calves (12.1 %). The majority of farm owners were more careful for the herd size, with less considerations for reproductive and fertility management. These findings coincided with what was reported by Sumberge (1992) in his study of livestock development in Gambia. He reported that herds may contain many uneconomic and infertile animals.

Cattle breeds:

The present study revealed that all the investigated dairy farms owned grade cows with more than 50 % exotic blood. Other studies indicated that the grade cows comprised 67 % of the herds while 27.8 % were local dairy (Tibin *et al.*, 1990). In another study in Port Sudan, Mohammed Kheir (2002) found that 92.4 % of the dairy herd was composed of local dairy cows. These variations clearly indicate that the dairy sector in Khartoum and the established AI programs were far more developed, when compared to other regions in the country. Establishment of modern dairy farms with exotic dairy breed in Khartoum State also might have contributed to the spread of grade dairy cows in Khartoum state and hence might have increased the amount of milk produced in Khartoum State.

Milk yield:

The average daily milk yield / cow amounted to 9.49 ± 3.0 kg, which was less than the 10.1 ± 5.1 kg reported by Tibin *et al.* (1990) for grade dairy cows in Kuku Dairy Project. The average daily milk yield found in this study was however, greater than the values reported by Habeeballa (1996) at the Eastern Nile, Khartoum State and Mohammed (1995) in some dairy farms at Khartoum State, who reported an average daily milk of 7.5 and 8.45

kg respectively. These variations might be attributed to the different feeding and management practices applied in the different studies and to the level of exotic dairy blood.

Lactation length:

Lactation length (LL) reported in this study averaged 269.85 ± 18.97 days. Ahmed *et al.* (1986) reported a shorter lactation length of 207 days in grade cows belonging to the Rahad Scheme. The present results however, complied with the data presented by Ageeb and Hiller (1991) in their study of the traits in a herd of crossbred cows between Frisian and Butana, but was shorter when compared to the lactation length of grade cows in Bulgravia, University of Khartoum Farm and Judiciary Farm as stated by Rahmatalla (2002). The author claimed that the lactation length in the three farms for grade dairy cows were 366.69 ± 107.51 , 371.46 ± 122.90 and 344.15 ± 188.11 days respectively. The wide range of standard deviation witnessed in these figures clearly indicated the wide variability experienced in those farms, suggesting that lactation length was a management controlled factor. The discrepancy between the results in the different farms also highlights the different management policies adopted in the dairy farms in Khartoum State.

Dry period:

In the present study the data revealed that the average dry period was 42.48 ± 28.56 days. The results were comparable to that reported by Habeebballa for crossbred cows in Eastern Khartoum State (49.5 ± 19). Fadel Moula (1994) reported a longer dry period for crossbred cows in Khartoum University Farm (96 ± 60 days). The dry period in this study was also shorter than that reported by Singh and Tomar (1990) for Kenana X Frisian crossbred (66 ± 1 day).

The variations in the length of the dry period in the different studies suggested the effect of different management and breeding policies adopted in the different farms, together with the interaction of the breeding, environment and feeding practices.

Feeding:

In the present study, the average daily consumption of the concentrate mix was 5.2 ± 1.45 kg, which was less than that reported by Elshatory (2000) in Bulgravia Dairy Farm and Tibin *et al.* (1990) in Kuku Dairy Project who stated that the average daily consumption of the concentrate mix for grade cows were 8 and 8.5 kg respectively while the average daily consumption of roughage was 11.0 ± 4.4 kg DM / cow, and also was less than that reported by Tibin *et al.*, (1990) in Kuku Dairy Project and El Amin (1994) in Bulgravia Dairy farm who stated that the average daily consumption of roughage for grade cows was 16.0 and 20 kg respectively.

Green fodders:

The results indicated that only 35 % of the farmers owned cultivable lands for growing their own roughages. Habeebballa (1996) found that 50 % of the owners leave their land uncultivated, hence purchase green fodder from the market.

CONCLUSION

The operation of milk production from dairy farms in Khartoum area was a function and interaction of so many factors ranging from the owner, his ways of managements, the environment, the availability of fodder and concentrates (their quality and prices) and above all the availability of the high milking cows.

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ممارسات الاقتصاد والإدارة في بعض مزارع الألبان
بولاية الخرطوم

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ملخص البحث:

تضمنت الدراسة مدي تطبيق وسائل الإدارة والرعاية الصحية والنظافة وشملت عدد وتركيبه القطيع – السلالة – الخصائص الإنتاجية وسياسات التغذية في مواقع مختلفة في ولاية الخرطوم .
في إستبيان 100 قطيع من الأبقار وجد أن إجمالي القطيع 9145 رأس بمتوسط 107.43 ± 91.45 بالنسبة لتركيبه وتكوين القطيع وجد أن 37.86% أبقار حلوب و 17.14% أبقار جافة ، 11.85% أبقار (ندف) و 33.15% عجول (ذكور وإناث) وثيران.
متوسط إنتاج البقرة اليومي 9.49 ± 3.0 كيلوجرام ومتوسط طول فترة الحليب 269.85 ± 18.97 يوم بينما متوسط فترة الجفاف 42.84 ± 28.56 يوم .
متوسط استهلاك الأعلاف الخضراء والأعلاف المركزة المقدمة للرأس في اليوم 11.2 ± 4.4 كجم و 5.23 ± 1.54 كجم علي التوالي بالنسبة للأبقار الحلوبه .