

A Case Study of a Dairy Camps in Khartoum State, Management and Health Aspects

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Abstract: This study was designed to identify the situation of dairy camps in Khartoum State (K.S) with respect to management, husbandry practices and to outline the health problems. Clinical examination of 764 cows and 2890 calves was done to diagnose the prevailing diseases in two seasons of the year, wet summer and dry summer from March-October 2004. Three hundred dairy farmers were randomly chosen and interviewed for two months (September-October 2004) to study the husbandry and management practices adopted in their farms. The results obtained showed that dry summer conditions favors the spread of tick infestation (62.5%) in the cow herd while in the calf herd dry summer favors the spread of pneumonia (60.3%) and calf scour (59.1%). Wet summer conditions in contrast favor the spread of pneumonia (53.8%), blood parasites (56.6%) in the cow herd while the same season of the year favors the spread of tick infestation (56.4%) and blood parasite (56.3%) in the calf herd. The incidence of mastitis (64%) and retained placenta (63.5) was also found to be greater in the wet summer conditions among the cow herd. Close relations was found to be between the poor husbandry practices adopted in Alrudwan Dairy Camp and the prevailing diseases diagnosed.

Key words: K.S, cow herd, calf herd, wet summer, dry summer, GMP

INTRODUCTION

Khartoum State (KS), as it embraces the capital township, is characterized by a high population density. The estimated total population is 5.7 million, increasing at a rate of 4.04% due to the continuous migration from the other States^[9]. The average milk consumption per capita in Khartoum State (KS) is 81.50 kg/year, and the total amount of milk and milk products needed is 465.000 tons annually, while the actual annual raw milk yield is 362.000 tons^[9].

This deficit gives a chance for imported powdered milk to take place in the market. All these facts ignite the need to improve the productivity of the dairy units, the system they adopt, the productivity of the local types of cattle and adopting the modern systems in dairy cow management and nutrition to bridge this gap of milk demand as milk is the nearest thing in nature to complete food especially for the infants and young's and elderly.

Out of the 40 million heads of cattle raised in Sudan, about 152.000 heads were raised in Khartoum state (K.S) for dairy production, mainly Kenana, Butana types as well as cross – bred cows (Mostly 50% Friesian) with an average yield of 3000 kg/lactation^[9] whereas the Ministry of Animal Resources and Fisheries^[7] estimated the average milk yield/cow/years as 2.8 tons (the foreign breed is 4.3 ton/year, cross – breed is 2.6 and the local types is 1.6 ton/year).

Milk production systems in (K.S) depend largely on the traditional sector which produces about 80% of

the milk consumed in the state. Other sectors include dairy co-operative societies, private sector farms and modern dairy farms^[9].

Objective of the study:

The objectives of this study is:

To Identify the situation of dairy camps in (K.S) with respect to management and husbandry practices. To outline the health problems encountered during a 9 months period (March – October, 2004) based on dry and wet summer season.

MATERIAL AND METHODS

Study Site: The present study was carried out at Alrudwan dairy campus, located in West Omdurman. The campus total area is 75 feddan with estimated total dairy units (Heyazat) of 430 Heyaza including over 12.000 heads of dairy cows (average 27 cow/heyaza raised in an area of 700 – 1000 sq m).

Alrudwan campus is one of the 17 dairy camps erected under the supervision of the state Ministry of Agriculture, Animal Resources and Irrigation^[6]. The main objectives of these dairy camps was to ensure sustainable fresh milk supply and to offer a package of veterinary and extension services to boost the awareness of rural cattle herders.

The housing system adopted at Alrudwan Campus is variable, most of the dairy units (Heyazat) have shades above ground level by about 3 – 3.5m, roofed by bamboo with an extended yard in front of the shade, each heyaza is provided by a feed manger either

build of concrete or portable manger made of steel, clean water is available all the day in water troughs. The feeding system depends on the indiginitum and the experience of the farm's owners and the Labors. The feed is purchased from the local markets, mainly roughages, (sorghum Stover and Abu 70) and concentrates (Groundnut cake, wheat bran and recently a total mixed ration (TMR) for dairy cattle.

50% of Alrudwan dairy campus keep the young calves of different ages together while only 5% keep calves separately (young suckling, weaned calves, heifers), while other dairy units show neither of the two – no herd structure system adopted and hence they feed the whole herd together with no respect to the stage of lactation or drying off, well trained milkers, milk the cows twice a day manually at 4:00 a .m and 2:00 p .m with interval of ten hours, the raw milk is distributed immediately after milking, no records were kept for the different activities done in each farm. Natural mating is the only way to access reproductive activity in Alrudwan Campus, vaccination against Hemorrhagic Septicemia (H.S) Black Quarter (B.Q), contagious Bovine pleuropneumonia CBPP and anthrax is carried on annually by the governmental veterinary services, the area of study is characterized by high temperature (40 – 40° C in summer during May - August) and lack of shades and trees.

Animal Clinical Examination and Treatment: 764 cows and 2890 calves were subjected to clinical examination from March – October 2004 (15 cases/day). A comprehensive case history is taken, general clinical examination is done according to Kelly^[5]. Blood, faecal, swabs and milk samples were collected according to the tentative diagnosis and sent to the laboratory, until the result is received, broad spectrum and supportive therapy is done and all these steps were reported immediately every day. The suspected cases were isolated until the treatment course is completed. The cases treated were tabulated for daily monthly and annual reports.

Management and Husbandry Practices: 300 farmers were randomly chosen and interviewed by well trained surveyors covered the whole campus direction (N, S, W, E). The questionnaire was designed to cover different husbandry and management practices as shown in table (3) and it continued for 2 months (September – October 2004). All answers given by the interviewee were first recorded. In order to solicit cooperation by the farmers, the interview were made at the time of vaccination which was free of charge. Interviewers were advised not to press the farmers for any answers or information the latter would not volunteer.

The interviewee answers were then ranked in a descriptive manner.

RESULTS AND DISCUSSIONS

Results:

Disease - Diagnostic Map: Data pertinent to the distribution of the prevailing diseases diagnosed in mature cow's herd based on season of diagnosis is presented in table (1). The total No. of cows diagnosed with pneumonia was 171 cows, out of this 79 cows (46.2%), turned to be positive in the dry summer season.

In the wet summer season the number of positively diagnosed cow was greater (92 cows) representing 53.8% indicating that pneumonia infection is widely spread during wet summer compared to dry summer.

The total number diagnosed as ticks infected was 195 cows. The prevalence of the disease is favored by dry summer condition compared to wet summer. The infected cows during wet summer season were 120 cows (62.5%) while only 75 cows (38.5%) for the dry summer.

Blood parasites were checked in 380 cows (43.4%) of the cases were recorded in the dry summer season (165 cows) compared to 56.6% during the wet summer season (215 cows). When the total numbers of cows diagnosed for the three diseases (746 cows). Infections were higher in the wet summer season (51.2%) compared to dry summer (48.8%) suggesting that wet summer conditions are more conclusive to disease spread than dry summer conditions.

The incidence of the prevailing disease affecting the calf herd is shown in table (2). The result of disease diagnosis indicated that out of 380 calves diagnosed as pneumonia – infected is 229 calves (60.3%) were in the dry summer season as compared to is only (39.7%) during the wet season. Manifestation of pneumonia among calves seems to be favored by the dry season conditions. Considering tick infestation, the result suggested that the infestation with ticks was favored by the wet summer season condition (56.4%) compared to the dry summer condition (43.6%). It worth mentioning that dry summer condition favors the spread of tick infestation in the cow herd in contrast dry summer condition favors the spread of pneumonia in the calf herd while the wet summer condition favors tick and blood parasite (56.3%) as compared to (43.7%) in the dry summer. Wet summer conditions were conclusive to blood parasites on both the cow and the calf herd.

The spread of calf scour was more evident in the dry summer (59.1%) when compared with wet summer condition (40.9%). The overall view of disease spread in cows and calves suggest that wet summer conditions are more favorable for disease spread than the dry summer.

Production Related Diseases: The data describing the incidence of production related diseases (metabolic diseases) among the dairy cows in Alrudwan dairy campus is shown in table (3). The results highlighted that out of 195 dairy cows diagnosed for mastitis

Table 1: Cows.

Disease	Total No. diagnosed	Dry summer		Wet summer	
		No.	%	No.	%
Pneumonia	171	79	46.2	92	53.8
Tick infestation	195	120	62.5	75	38.5
Blood parasites	380	165	43.4	215	56.6
Total	746	364	48.8	382	51.2

Table 2: Calves.

Disease	Total No. diagnosed	Dry summer		Wet summer	
		No.	%	No.	%
Pneumonia	380	229	60.3	151	39.7
Tick infestation	1216	530	43.6	686	56.4
Blood parasites	952	416	43.7	536	56.3
Calf scour	342	202	59.1	140	40.9
Total	2890	1377	47.6	1513	52.4

Table 3: Production related diseases among dairy cows diagnosed at Alrudwan dairy campus during (March-October, 2004).

Disease	Dry summer		Wet summer	
	No.	%	No.	%
Mastitis	69	35.40	126	64.60
Milk fever	16	59.30	11	40.70
Retained placenta	27	36.50	47	63.50
uterine prolapse	2	28.60	5	71.4
Total	114	-	189	-
Over all	303	-	-	-

Table 4: Management Practices at Alrudwan dairy campus during (March-October, 2004).

A – General Management Practices (GMP)	
Item	Situation
Herd structure	Deformed
Ventilation	Poor
Draining sanitation	Very poor
Suitability of troughs	Not suitable
Opportunity of exercise	Very narrow
Milking place hygiene	Poor
Breeding policy	Natural mating, poor heat detection and no pregnancy diagnosis
B – Management History	
Item	Situation
Record keeping	Not practiced
Removal of supernumary teats	Not practiced
Hoof trimming	Not practiced
Quantity of the feed offered	Less than the requirements
Quality of the feed offered	Poor
Vaccination	Regular
Vaccination against Brucellosis	Not practiced

infection, only 69 cows (35.4%) were diagnosed positively during the dry summer and 126 cows (64.6%) were diagnosed positively during the wet summer. For milk fever (parturient hypocalcaemia) a total of 27 cows were examined, 16 out of them

experienced the disorder during the dry season (59.3%) and 11 (40.7%) suffered from parturient hypocalcaemia (milk fever), during the wet summer season. From 74 cows in the dairy herd with retained placenta following calving 27 (36.5%) of them were during the dry summer and 47 cows (63.5%) during the wet summer season.

The last occurring disease in Alrudwan dairy campus was the uterine prolapse where the total diagnosed cases was 7 out of which 74.1% (5 cows) were diagnosed in the wet summer season while 2 cows (26.6%) were positively identified during the dry summer.

The management and husbandry practices adopted by farm owners in Alrudwan dairy campus are summarized in table (4). The data is categorized in two classes A and B. The A list consisted of General Management Practices (GMP) that describes the herd structure, homing facilities particulars and the breeding policy. The other component “B” dealt with general herd husbandry practices including, record keeping, hoof trimming, supernumary teat removal, feed quality and quantity and health attributes like vaccination – the data revealed that, the herd structure was not optimum and can be described as deformed. Five vital management practices that can promote the performance of the herd are not practiced.

They include: Record keeping, dehorning, vaccination against Brucellosis among heifers (7–9 month of age) removal of extra teats at calf hood and hoof trimming. The drainage system prevailing was very poor whereas ventilation, general hygiene at both maternity and pens and milking parlours are

poor. The quality of feed offered was below the recommended standards together with poor quality feed. The breeding policy adopted was through natural mating accompanied by poor heat detection strategies and complete absence of pregnancy diagnosis (PD), vaccination against some endemic diseases like H.S., B.Q, CBPP and anthrax is the only element practiced routinely on an annual base.

Distribution of Prevailing Diseases in the Study Site

Based on Season of Diagnosis:

Discussion: The diseases diagnosed in this study were made predominantly on clinical signs and it is not always possible to ascertain the a etiological agents and this is clear in the cases of pneumonia and mastitis. These diseases reported in Alrudwan dairy Campus are a reflection of the diseases in Khartoum state (K.S) dairy units, diseases in dairy cattle cause annual loses of million Sudanese dinars (SD), a large portion of which is attributable to deaths, treatment costs, reduced feed efficiency and drop in milk yield.

In cows, the pneumonia cases diagnosed in wet Summer (53.8%) are slightly larger than the cases diagnosed during dry Summer (46.2%) and this may be attributed to the poor ventilation and drainage condition in Alrudwan dairy units where in wet Summer the soil bedding provided is always wet and damp due to the lack of good management practices (GMP) i.e. periodical change of the bedding in wet Summer.

The situation in calves considering pneumonia cases is different where the incidence of pneumonia during dry summer is larger (60.3%) than the incidence of the disease during wet summer (39.7%) realizing that the incidence of the disease among the calves is greater than among the adult cows and this is one of the reasons that weaned calves should be observed at least twice daily for evidence of respiratory disease and treated promptly, if necessary^[2]. Another reason might be the crowding of the calves pens which will predispose them to respiratory diseases in addition to the fact that some heifers and sometimes dairy cows imported from out side the Campus (mainly the white Nile) and introduced without quarantine measures into the herd, the chance that such cows are stressed and pneumonia is dominant at the time of transport from the range to the dairy units. Tick infestation among the cows in Alrudwan dairy units is greater in dry summer compared to wet summer^[3] reported that diseases caused by ticks are of two kinds, primary and secondary, the former is related to the tick feeding activities ,while the latter kind is far more

common and is due to the effects of the parasites carried by the ticks. Again the incidence among calves is more greater than cows and appear to be higher during wet summer, the major cause for the wide spread of tick infestation in Alrudwan dairy campus is the muddy and baked-bricks buildings that wall of which contain cervices where ticks stay for years, unless proper housing is made the only attempt to be done is the periodic dipping or spraying and according to Anon^[1] complete eradication is extremely difficult because of the persistence of ticks, especially multi host ticks. The blood parasites diagnosed in Alrudwan dairy units are mainly tick borne diseases (TBD), however the correlation ($r = 0.51$) between the tick infestation and the tick borne disease (TBD) incidence was found to be not significant ($P \geq 0.05$) the (TBD) diagnosed among the cows in wet summer is greater (56.6%) than the incidence of the disease in dry summer (43.4%), the incidence of the (TBD) among the calves in wet summer is (56.3%) while in dry summer reached (43.7%).likewise the greater involvement of calves with the disease was in the wet summer(56.3%) rather than in the dry summer(43.7%). Calf scourage cases diagnosed among calves in Alrudwan dairy units reached 342 cases, 59.1 % during dry summer and 40.9% are diagnosed during wet summer, Blowey, 1998 reported that scouring is the commonest disease in young calves and it without doubt the greatest single cause of death. Scouring means that more fluid is lost via the faeces and if this is not replaced by additional intakes by mouth, dehydration occurs; the blood becomes " thicker" and more difficult for the heart to pump, poor circulation develops, body temperature drops and the calves goes into a state of shock, to counteract this massive loss of fluids in the faeces, the scouring calf requires much higher fluids to be offered in small quantities 4-6 times a day. In Alrudwan dairy units area, the ambient temperature in dry summer reaches 40° C and this will aggravate the condition of the scouring calves by losing through sweating excessive quantities of sodium, potassium, chloride and carbonate, the loss of carbonate on the other hand leads to acidosis.

The production related diseases (sometimes referred to as metabolic disorders) diagnosed in Alrudwan dairy Campus during wet and dry summer showed 195 cases of mastitis 35.4% of which were diagnosed during dry summer while the remaining 64.6% were seen during wet summer, mastitis continuous to be a major cause of economic loss to the dairy herd. The basis of mastitis control is therefore an improved herd management Blowey^[3] and this practice is found to be very poor in Alrudwan dairy campus (Table 4). The herd management

concerning mastitis prevention is undoubtedly more cost effective to accept a low level of infection within a herd than to spend large sum of money trying to eliminate the last few cases. The poor hygiene in milking places in Alrudwan dairy campus may maximize the risk of faecal contamination of the teats during milking and this is why it is strongly recommended that teats must be cleaned and dried with an individual piece of cloth or towel paper to avoid contamination or environmental mastitis which is mainly caused by *E. coli*^[11].

The milk fever (Parturient hypocalcaemia) cases reported during dry summer and wet summer are 27 cases, 59.3% occurring during dry summer and 40.7% were obtained during wet summer, the condition is known to be caused by a severe drop in the concentration of Calcium in the blood and the extra cellular fluids (ECF)^[11] the increased incidence of milk fever in dry summer may be attributed to the lack of good quality roughages during this season of the year and also the poor nutritional management in Alrudwan dairy Campus which forces the cow to mobilize more amount of Calcium from its body reserve.

On the other hand 74 cases of retained placentae (R.P) cases were diagnosed in Alrudwan dairy campus, 63.5% during wet summer while 36.5% during dry summer. Seven (07) cases of uterine prolapse were treated during the same period of which 71.4% occurred during wet summer, and 28.6% during dry summer and this may reflect the management disorders, especially during wet summer where the dairy houses are wet and the cows are stressed and uncomfortable.

Many disease could be prevented with good management practices (GMP) as described by the FAO^[4] and the proper nutritional programmes. Although viruses, bacteria and other microorganisms are the main causes of the disease in domestic animals, errors in management and nutrition are significant predisposing factors but in spite of the importance of these factors is well known, many individual still seek a cure-all for disease problems^[10].

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