SUST
Journal of Agricultural and Veterinary Sciences
Journal homepage:
http:// journals.sustech.edu

Some Productive and Reproductive Traits of Cross-bred Dairy Cows in NorthDarfur

Ismail M.A. Ismail[1] and Anas M. Osman[2]

1. Department of Animal Production, College of Natural Resources and Environmental Science, Elfashir University
2. Department of Animal Production, College of Animal Production Science and Technology, Sudan University of Science and Technology

*Corresponding address: E-mail: abuareege@gmail.com, Fax: +249 731 4211, P.Box: 125 Elfashir, Sudan

Article history: Received: 13.06.2012
Accepted: 20.10.2012

Abstract

The present study was conducted in North Darfur (Elfashir) during the period from March 2006 to April 2008 to assess the milk production and some reproductive traits of cross-bred dairy cows with Friesian (foreign inheritance over 50%) under tropical conditions in North Darfur (El-Fashir). Records of 123 cross-bred cows were studied in addition to some productive and reproductive traits for 30 lactating cows were also studied in three selected dairy farms: (farm-1, farm-2 and farm-3). It was found that the total herd size was 153 head structured as; 47.7%, 16.34%, 17%, 15.7% and 3.18% lactating cows, dry cows, heifers, calves and bulls respectively. The farms were visited weekly for recording daily milk production, and daily observations.The study revealed that the mean milk production per cow per day was 10.4±7, 11.85±8 and 10.2±9kg in farm-1, farm-2 and farm-3 respectively, with an overall average of 10.82±8 kg, with no significant differences ($p<0.05$)(ANOVA) and the age at 1st calving was 31.4±3, 29.3±2.3 and 31.7±3.2 months in farm-1, farm-2 and farm-3 respectively, with overall average30.8±3.23 months with non-significant differences in one way ANOVA table and there was high correlation between milk production and age at 1st calving ($p<0.05$). Whereas the open period and period were 76±18, 74.2±16 and 89±22 days as for open period and 75.6±6, 84.3±9 and 86±4 days for dry period in farm-1, farm-2 and farm-3 respectively, with overall average 80±16 days as open period and 82±8 days as dry period. The persistency was ranging between 4th to 9th week, 3th to 10th week and 4th to 9th week in farm-1, farm-2 and farm-3 respectively.

Key words: Transhumant pastoralism, Lactation Curve, Persistency, Open

Introduction

According to FAO (2005) Sudan owned a population of 128.7 livestock distributed as 38.3, 47.3, 39.9 and 3.2 million heads for cattle, sheep, goats and camels respectively. Ajeeb *et al.*, (2010) found that livestock production in Sudan in general and in Darfur in particular is based on transhumant pastoralism and communal grazing, but according to Basher (1990) there were many attempts of crossing between local breeds (Kenana and Butana). In the study ofKenana dairy herds structures Attaia (1986) reported 35% as average of lactating cows and Abelmagid (1987) reported 35% of the herd are lactating cows in Kuku dairy project. Makawey and Ahmed (2005) reported that the average of milk production is about 2.9

ISSN (Print): 1858 6775
eISSN (Online): 1858-8775

kg per day in both Kenana and Butana cattle, but Ahmed (2004) reported 7.5kg per day in Kenana Cattle. As for Age at 1st calving which is the period from the date of birth to the date of first calving,Abdalla (2002) stated that Friesian heifers calved at age less than 30 months and Habeeballa (1996) reported that the age at 1st first calving ranged from 36 to 40 months for local breeds (Kenana, Butana and Baggara cows) but Alim (1960) gave 38,4 months for Kenana cows.For the calving interval is 395 days for Kenana Cows as stated by Alim (1960) compared with 360 days for Friesian cows under Sudan environment as mentioned by Basheer (1990).Whereas the open period and dry period, Rahmattalla (1999) stated that the average open days is 86.6 days in Friesian cross-bred cows, whereas Ageed (1978) mentioned 139.6 days in Sahiwal and Sahiwal crossed with Holstein Friesian. For the dry period Heinrichs and ken (2005) stated that milk yield usually reduced when the dry period is less than 25 to 60 days. Another pattern of lactating cows is the persistency, which means according to Makawey and Ahmed (2005) the capability of the cow to keep peak yield as long as possible. Rahamattalla (2002) reported that the persistency does not extent for more than ten weeks from calving date in best dairy breeds on average.

Despite the large numbers of livestock in Sudan but the lack of raw milk and milk products remained sharply that due to the weakness of productive potentiality of local breeds, compared with foreign breeds. Hence Important of the this study that the best alternative for milk supply to overcome the lack of milk in Darfur in general and Elfashir in particular are the attempts of crossing between local breeds (Kenana and Butana) with the exotic dairy breeds as e.g. Holstein-Friesian which have a higher milk production potential, in order to improve the genetic potential of Sudanese dairy cattle, while keeping, a degree of adaptability to local environment. So this study aimed to assess the milk production and some reproductive pattern that affect milk yield and to high light the economic importance in cross-bred cows in North Darfur.

Materials and Methods

Study area: The study was conducted in North Darfur state (Elfashir) in the period from March2006 to April 2008

The Study Animals: The study was conducted on 153crossbred dairy cows with 50 cross bred dairy cows (Kenana/Butana x Holstein-Friesian) with over 50% foreign inheritance and from three farms in Elfashir (in which proper record were available); (Nahar farm-1, Dr. Haneen-2 farm and Military farm-3)

Type of Study Designing: comparative case study

Data collection Methods: The obtained data was collected from:

- Experiment included 30 lactating cows in rate of 10 cow from each farm of three investigated farms,
- The experiment designed in Randomized complete block design
- Record for three to five previous years from 2003 to 2008) for 123 heads of Crossbred cattle were studied in the three farms.
- The data collected included herd size and structure, age at first calving, milk yield, open days, dry period and number of, lactation season, and lactation curve.

Data Analysis: Data analyzed by (SPSS, 2009) through descriptive statistics (frequencies) for nominal variables in Table 2 and compared means and one-way ANOVA for numerical variables to calculate averages, S.E. mean and significant differences as in (Table 2)

ISSN (Print): 1858 6775
eISSN (Online): 1858-8775

Results and Discussion

Herd size and structure of cross-bred dairy cows in North Darfur

Herd size: From Table (1) It was found that the herd size at the three farms was 49, 73 and 31 heads in Farm -1(Dr. Nahar dairy farm), Farm-2 (Dr. Haneen dairy farm) and Farm-3 (Military dairy farm) respectively.The biggest herd was in Farm-1 and the smallest in Farm-3 and the total size of study herd was 153 heads.

Herd structure: Table (1) showed that the overall percentages of herd size were 32.03%, 47.7% and 20.26% in farm-1, farm-2 and farm-3 respectively. The average of Lactating cows in the investigated farms were, 46.6%, 50.7% and 41.9% in farm-1, farm-2 and farm-3 respectively, with total average about 47.7%

Table 1: Herd size and structure of cross-bred dairy cows in North Darfur

Parameter	Farm1		Farm-2		Farm-3		Total	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Average
Herd Size	49	32.03	73	47.7	31	20.26	153	100%
Lactating cows	23	49.96	37	50.7	13	41.9	73	47.7
Dry cows	8	16.33	11	15.07	6	19.35	25	16.34
Heifers	10	20.4	11	15.07	5	16.13	26	17
Calves	6	12.24	12	16.4	6	19.35	24	15.7
Bulls	2	4.1	2	2.74	1	3.23	5	3.18

These percentages are slightly higher than that mentioned by Attia (1986) and Abelmagid (1987) who reported 33.6% lactating cows from Kenana herd and 35% lactating cows in Kuku dairy project respectively. That because the owners used to send some of dry cows out of farms to graze on natural pastures especially in farm1 Dry cows, heifers, calves and bulls represent 17.13%, 17.4%, 16.01% and 2.8% of the total herd size respectively. The percentages of herd structure in the investigated herd were also a bit different than that stated by Abdalla (2002) who reported 11.77%, 21.69%, 32.03% and 1.77%, dry cows, heifers, calves and bulls respectively. The highest percentage of lactating cows was 50.7% in Farm -2 (Dr. Haneen Farm); this indicated that a proper management system was followed according to the veterinary background of the manager and the lowest percentage was 41.9% in Farm -3 (Military farm).

Some production and reproduction traits of cross-bred dairy cows

Milk yield (kg): The average of milk yield per cow (Table 2), in the three investigated farms, were10.4 ±7, 11.85±8 and 10.2±9 kg, per day, in Farm-1, farm-2 and Farm-3 respectively**.** While the total average of milk yield of the investigated farms was 10.82±8kg per day with non-significant differences ($p<0.05$) between the concern farms and highly correlated to age at first calving (appendex-1) theses values were higher than that stated by Makawey and Ahmed (2005) who reported and 2.9 kg per day as average milk yield for Kenana and Butana cows and higher than that mentioned by Abdelmagid (1987) and Ahmed (2004) who gave 5.6 kg and 7.5 kg as milk yield average per cow per day respectively for local cows Kenana and Butana . The total milk production for three farms was 2256.74 kg per season per cow; this value was less than that reported by Makawey and Ahmed (2005) who reported 5500 to 6500 kg milk yield for Friesian cows per season.

ISSN (Print): 1858 6775
eISSN (Online): 1858-8775

Age at first calving: Table (2) showed that the age at first calving ranged between 27 to 36 months, with an overall average of 30, 8±3 months. There was a significant correlation between the age at first calving and lactation season ($p<0.05$) (Appendex-1).This average of age at 1st calving in this study were slightly lower than that stated by Habeeballa (1996) who reported 36-40 months for Kenana and Butana andAlim (1960) who reported 38,4 months for Kenana cows.

The differences between age at first calving in the current study and that reported by Habeeballa (1996) and Alim (1960) might be related to inheritances factors due to crossing with Friesian breeds. The range of age at first calving from24 month's to36 months in this study was higher than that reported by Habeeballa (1996) who reported 36-40 months in cross-bred and 24 months in pure Friesian cows and these results agreed with that reported by Abdalla (2002) who stated that Friesian heifers calved at age less than 30 months.

Open period (service period): Table (2) showed that the open period in the investigated farms ranged between 61-125 days, with overall average 80±16.7 days. These results were in line with that reported by Rahmatalla (1999) who reported 84.6 days in Friesian cross-bred. The open period in this study was also lower than that stated by Ageed (1978) who found that the service period was 139.6days in Sahiwal and Sahiwal × Holstein,

Dry period: The overall average of dry period, in the investigated farms (Table-2) was 82.8±8 days. The average is longer than that reported by Heinrichs and Ken (2005) who stated that milk yield in lactating cows usually reduced when the dry period is less than 25 to 60. Dry period more than 60 days always resulting in shortening of lactation

Table 2: Some Productive and Reproductive Traits of Cross-bred Dairy Cows in NorthDarfur

Parameter	Farm1	Farm2	Farm3	Average	Total*kg/season
Average of milk yield\cow\day in kg	10.4±7a	11.85±8a	10.2±9a	10.82±8*	2256.74
Minimum	5.9	6.57	4.73	-	-
Maximum	9.4	10.52	9.2	-	-
Age at first calving\months	31.4±3a	29.3±2.3a	31.7±3.2a	30.8±3.2*	-
Minimum	27	24	27	-	-
Maximum	36	33	36	-	-
Open period\days	76±18a	74.2±16b	89±22a	80±16.7	-
Minimum	60	53	61	-	-
Maximum	115a	105b	125a	-	-
Dry period\days	75.6±6	84.3±4	86±14	82±8	-
Minimum	28	35	62	-	-
Maximum	136	120	125	-	-

a: no significant differences (in one way ANOVA table)
b: significant difference (in one way ANOVA table)
* Correlation to ($p<0.05$)

Persistency: The persistency in the investigated farms (Figure 1) was ranging between the 4thweek to 9thweek, from3rd to 10thweek and from 4th to9thweek in farm1, farm2 and farm3 respectively. Farm (2) showed the longest persistency in comparison with other two farms which ranged from 4 to 10 weeks with average of 7 weeks. These values agreed with Rahmatalla (2002), who reported that, the rising in milk phase doesn't extend more than 10 weeks from calving.

ISSN (Print): 1858 6775
eISSN (Online): 1858-8775

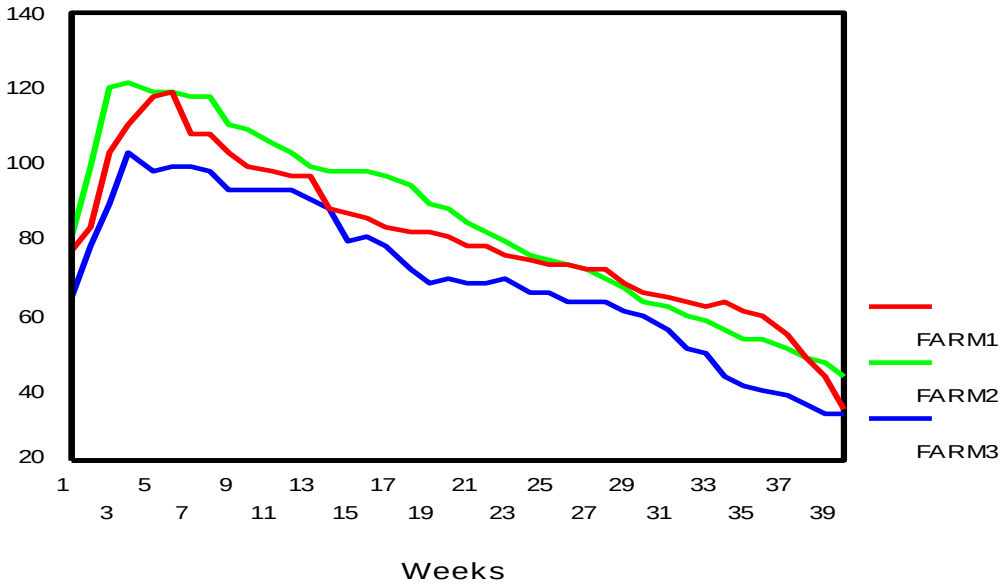

Figure 1: Lactation Curve of the three farms

Conclusion

The performance of the cross-bred dairy cows in investigated farms varies from one to another and the average daily milk production in general is low than what expected that due to; improper hygienic measurements, associated with high temperatures and poor system of management.

References

Abdalla, S.A. (2002). Milk Production and its Projects Management Sudan. Chapter 2: Animal Production systems in Sudan P. 33. (Arabic).

Abdelmagid, O.A. (1987).*Dairy Husbandry practices of Kuku Dairy project*. M.Sc. thesis in Animal production. University of Khartoum, Sudan

Ahemd, Khalil A. (2004). Meat and Milk Cattle Husbandry. Notes, Anim. D.P. prod. Eep. Agri. Studies college. Sudan University

Ajeeb, Abdelgadir, Ibrahim Elnour, Ismail Mohammed Ahmed and Elsir.A, (2010), *Nomadic Population base line survey*. North Darfur, Faculty of Natural resources and Environmental science (Elfashir University) in collaboration with International Organization for Migration (IOM)

Alim, K.A. (1960). Reproductive Traits and Milk Yield of Kenana Cattle in Sudan. *Journal of Agricultural Science, (Cambridge)*: **55** – 183 – 188.

Attia, E.E. (1986). Some Breed Characteristics and Milk Recording of Kenana Cattle in Villages Herds.M.Sc. thesis U.K.

Bashir, I.E. (1990). *Reproductive Performance of Holstein – Friesian Dairy Cows with Indirect Comparison to Different Cross-bred Grades in the Sudan*. Thesis for M.Sc. degree Animal Production, University of Khartoum

FAO (2005). Food and Agriculture Organization of the United Nation, *Livestock information*, Sector of Analysis and Policy Branch

ISSN (Print): 1858 6775
eISSN (Online): 1858-8775

Habeeblla, A.M. (1996). Assessment of Dairy Farming Practices in Eastern Nile, Khartoum State.Thesis for M.Sc. in Animal Production. University of Khartoum

Habeeblla, A.M. (1996). *Assessment of Dairy Farming Practices in Eastern Nile, Khartoum State*.Thesis for M.Sc. in Animal Production. University of Khartoum. Sudan

Heirichs, J., and Ken. B. (2005). Dairy and Animal Science http://das.psu.edu.teamdairy

Makawey, A., and Salaheddin S. Ahmed (2007). *Basics of Animal Production Science, Second Edition*- G. Town press. Khartoum.Sudan

Rahmatalla, S.A. (2002). *Productive, Reproductive and Nutritional Factors* Leading to cutting of Cows in three Dairy Farms in Khartoum North.M.Sc thesis. Anim. Prod. University of Khartoum, Sudan.

SPSS (2009). SPSS Survival Manual, SPSS version 12 for Windows, Second Edition, www.daralfarouk.com.eg

ISSN (Print): 1858 6775
eISSN (Online): 1858-8775

بعض الخصائص الإنتاجية والتناسلية لأبقار اللبن الهجين في شمال دارفور

اسماعيل محمد أحمد[1] و أنس محمد عثمان[2]

1. قسم الإنتاج الحيواني- كلية علوم البيئة والموارد الطبيعية – جامعة الفاشر- السودان ، 0912829694
2. قسم الانتاج الحيواني- كلية تكنلوجيا وعلوم الإنتاج الحيواني- جامعة السودان

المستخلص:

أجريت هذه الدراسة في شمال دارفور(الفاشر) لتق ويم انتاج اللبن وبعض الخصائص التناسلية لأبقار اللبن الهجين ذات الدم الاجنبي اكثر من 50% في شمال دار فور (الفاشر). تمت دراسة عدد 123 سجل للابقار الهجينبالأضافة إلي 30 بقرة حلوب في ثلاثة من مزارع الألبان (المزرعة- 1، المزرعة-2 والمزرعة-3)وكانت الزيارة أسبوعياً لتتسجيل انتاج اللبن اليومي والملاحظات .وجد أن العدد الكلي للقطيع هو 153 راس يتركب كما يلي: %، 16.34%، 17%، 15.7% و 3.18% أبقار جلوب، أبقار جافة، عجلات عشار، عجول و فحول على التوالي. أوضحت الدراسة أنّ متوسط انتاج اللبن اليومي للبقرة كان 7±10.4 و 8±11.85 و 9±10.4 كجم في المزرعة-1، المزرعة-2 والمزرعة-3على التوالي، مع متوسط انتاج كلي 8± 10,4كجم في اليوم دون فرقات معنوية ($p < 0.05$) في جدول تحليل التباين والعمر عند أول ولادة كان 3±31,4 و 2,3±29,3 و 3,2±31,7 شهراً في المزرعة- 1، المزرعة-2 والمزرعة-3على التوالي مع متوسط كلي 3.23±30,8 شهراً ولا توجد فروقات معنوية ($P<0,05$) في جدول تحليل التباين احادي الأنجاه و هناك ارتباط بين انتاج اللبن والعمر عند أول ولادة .أما الفترة المفتوحة وفترة التجفيف كانت 18±76، 16±74.2 و 22±89 يوماً كفترة مفتوحة و 6±75 و 9±84 و 4±86 يوماً كفترة تجفيف والمثابرة تتراوح بين الأسبوع الرابع والتاسع ، الأسبوع الثالث والعاشر الأسبوع الرابع والتاسع في المزرعة-1، المزرعة-2 والمزرعة-3على التوالي.

ISSN (Print): 1858 6775
eISSN (Online): 1858-8775