Emir. J. Agric. Sci. (1992) 4 : 110-119

Performance of Sharabi Cattle

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ABSTRACT :

Total milk yield, lactation period, dry period, calving interval, days open, age at first calving and number of services per conception in a Sharabi cattle herd at Al-Rashidia farm in Nineveh, northern Iraq, were studied. The means for the corresponding traits were 820.84 Kg, 160.18, 251.08, 409.20, 144.47, 1157.73 days and 1.64 services, respectively. Year of calving affected total milk yield, lactation period, dry period and number of services per conception ($P < 0.01$) and days open ($P < 0.05$). Parity and season of calving effects on all traits lacked significance.

Keywords : Dry period, Lactation period, Milk yield, Repeatability, Sharabi.

INTRODUCTION

The Sharabi is a cattle breed indigenous to the northern part of Iraq. It is small in size and black in colour with a white line dividing the body along the abdomen, chest and back into two halves. Some white spots may be seen on the sides. In view of the limited information available on this breed (Haddad, 1981), this work was undertaken to throw some light on several productive and reproductive aspects of this breed.

MATERIALS AND METHODS

In a herd of 79 Sharabi cows, production and reproduction records collected over 1974-1987 were studied. The cows were originally purchased form local farmers and

kept at the Al-Rasheediyah farm, Nineveh Governorate, north of Iraq.

Lactation records included in this study were all normal, unaffected by disease and over 60 days in duration. Cows were inseminated artificially no less than 60 days postpartum.

Feeding of cows varied with seasons and years depending on the feedstuff available. Lucerne and/or wheat straw were fed. A concentrate mixture was offered consisting of ground barley, wheat bran, soybean meal and salt to each milking cow at a daily rate of 4 Kg.

Data were statistically analyzed using the Maximum Likelihood method (Schaeffer, 1976) according to the following assumed model :

$$Y_{ijklm} = \mu + C_i + S_j + E_k + P_l + e_{ijklm}$$

Where :

Y_{ijklm} : is the value of the trait studied,

μ : is the overall mean,

C_i : is the random effect of the i^{th} cow with Zero mean and variance of I^2_c

S_j : is the fixed effect of the j^{th} season of calving ($j = 1,2,3,$ and 4),

E_k : is the fixed effect of the k^{th} year of calving ($k = 1, 2, ..., 6$),

P_l : is the fixed effect of the l^{th} parity ($l = 1,2,.... >5$)

e_{ijklm} : is a random error associated with each record having a normal distribution with zero mean and a variance of I^2_e

In describing total lactation milk yield, its partial regression on lactation period was also included in the above model. For age at first calving the cow and parity effects were removed from the model. Season and year of birth effects on age at first calving were considered instead of season and year of calving. Estimates of repeatability were obtained from the between and within cows variance components.

RESULTS AND DISCUSSION

Total milk yield and lactation period averaged 820.84±35.97 Kg and 160.18±4.29 days, respectively (Table 1). Both traits were significantly affected by year of calving (Table 2) and were lower than those reported earlier for Iraqi breeds, namely the Sharabi (Haddad, 1981) and Jenubi (Maarof et al., 1987 and Magid et al., 1989). Such low estimates could be attributed to inadequate feeding and management practices followed during the course of this study and/or that the Jenubi has better genetic make up for milk production.

The averages, however, were higher than those reported for Karadi cattle in northern Iraq (Issa, 1979). The significant year effect on total milk yield and lactation period are in agreement with those reported on the Jenubi cattle (Maarof et al., 1987).

Lactation milk yield was also significantly affected by the length of lactation (Table 2); the partial regression coefficient was 5.44±0.32 Kg/day (Table 1). This result is in accordance with those of Maarof et al., (1987) and indicates the importance of lactation period as a factor determining total milk yield.

Dry period was significantly affected by year of calving (Table 2). It averaged 251.1±8.27 days (Table 1) compared to 179.7 days in the Sharabi (Haddad, 1981), 159.2 days in the Jenubi (Maarof et al., 1987). The long dry period obtained in the present study reflects the short lactation period which was due to the low levels of feeding and management practices followed at the farm and/or the genetic make up of the cows.

Table 1. Solutions*, Standard errors and number of records for the fixed effects on total milk yield, Lactation period and dry period.

Effect	Total milk yield		Lactation period		Dry period	
	No	Solutions ± S.E.	No	Solutions ± S.E.	No	Solutions ± S.E.
Overall mean	165	820.84 ± 35.79	177	160.18 ± 4.29	158	251.08 ± 8.27
Season of calving						
Dec. - Feb.	40	-0.96 ± 52.35	42	-14.67 ± 13.58	40	0.48 ± 23.46
March - May	55	-95.56 ± 50.09	60	-16.79 ± 12.84	55	-7.43 ± 22.11
June - August	36	-88.11 ± 52.71	39	-10.31 ± 13.67	34	-24.20 ± 23.84
Sept. - Nov.	34	00.00 ± 00.00	36	00.00 ± 00.00	29	00.00 ± 00.00
Year of calving						
1974 - 1977	30	209.02 ± 69.66	32	94.58 ± 15.52	30	-69.36 ± 28.49
1978 - 1979	26	-16.67 ± 63.15	26	72.01 ± 15.41	20	-67.77 ± 29.06
1980 - 1982	20	1.11 ± 62.36	20	29.13 ± 16.15	19	25.22 ± 28.74
1983 - 1984	23	-41.68 ± 59.18	29	-10.57 ± 14.40	32	42.98 ± 25.06
1985	33	137.83 ± 51.30	33	-16.53 ± 13.33	36	38.36 ± 24.34
1986 - 1987	33	00.00 ± 00.00	37	00.00 ± 00.00	21	00.00 ± 00.00
Parity						
1	49	-52.38 ± 62.55	55	-4.19 ± 16.17	55	40.33 ± 27.20
2	48	-34.20 ± 57.97	51	7.48 ± 15.29	42	43.81 ± 26.28
3	29	-3.44 ± 61.88	30	-11.42 ± 16.48	25	39.75 ± 27.49
4	16	24.60 ± 68.28	18	-28.86 ± 17.68	16	55.06 ± 28.97
5 and over	23	00.00 ± 00.00	23	00.00 ± 00.00	20	00.00 ± 00.00
Regression on lactation period (Kg/day)	165	5.44 ± 0.32	-	-	-	-

* Solutions as estimated differences from the last group of each factor.

Table 2. Analysis of variance for various effects on some economic traits of Sharabi cattle (F-values).

Source of variation	DF	Total milk yield	Lactation period	Dry period	Calving interval	Days open	Services per conception	Age of first calving (a)
Season of calving	3	2.18	0.62	0.49	0.47	0.52	2.08	0.13
Year of calving	5	5.98**	14.65**	6.39**	1.91	2.47*	4.77*	11.52**
Parity	4	0.49	1.66	1.01	0.48	0.56	1.64	-
Regression on lactation	1	293.43**	-	-	-	-	-	-
Period error (b)		151	164	145	151	132	195	35

a Season and year of birth were considered and their degree of freedom were 3 and 2 respectively.

b Figures given indicate the corresponding degrees of freedom.

* $P < 0.05$

** $P < 0.01$

Calving interval, days open and number of services per conception averaged 409.2+5.53, 144.5+5.93 days and 1.64+0.08 respectively (Table 3). The calving interval obtained is comparable to that reported for the Sharabi (Haddad, 1981) but longer that for the Jenubi (Maaroof et al., 1987). On the other hand, days open was longer than those reported for Iraqi breeds (Haddad, 1981 and Maarof et al., 1987). Reproductive efficiency as expressed by the number of services per conception was higher in the present study (1.64) than the estimate (1.8) reported earlier on the same breed (Haddad,. 1981). Moreover, Mahmoud (1988) reported significant breed effect on number of services per conception with averages being 1.74, 2.03 and 4.04 for the Sharabi, Friesian and their crosses, respectively.

Year of calving affected both the number of services per conception ($P<0.01$) and days open ($P<0.05$), whereas its effect on calving interval lacked significance (Table 2). Calving interval and days open were longest during 1980-1982 and shortest during 1986-1987 (Table 3). Moreover, cows needed more services to conceive during 1974-1977 as compared to least services during 1986-1987. Such results reflect the roles of management and feeding practiced, particularly the breeding policy followed during the course of the study, which affected the length of the period between calving and the following service, number of services per conception and eventually affect the length of days open and calving interval. Such policy effect, however, would be reflected in the length of the lactation period and/or dry period as they are related to each other.

Age at first calving, which averaged 1157.7+56.69 days, (Table 3) was higher than the estimate (29.83 months) reported earlier on the same breed (Haddad, 1981) and the estimate (33.3 months) pertaining to the Jenubi cattle (Maarof et al., 1987).

Table 2 reveals highly significant ($P< 0.01$) year effect on the age at first calving. Whereas, the effect of season of birth lacked significance. Cows born during 1974-1977 were older at first calving (around 18 months) than those born later. This reflects the change in management and breeding policies followed at the farm over the years.

Table 3. Solutions*, Standard errors and number of records for the fixed effects on calving interval, days open, number of services per conception and age at first calving.

Effect	Calving interval		Days open		Services per conception		Age at first calving [a]	
	No	Solutions ± S.E	No	Solutions ± S.E.	No	Solutions ± S.E.	No	Solutions ± S.E.
Overall mean	164	409.20 ± 5.53	145	144.47 ± 5.93	208	1.64 ± 0.08	41	1157.73 ± 56.69
Season of calving								
Dec. - Feb.	40	-11.28 ± 17.32	38	-20.08 ± 18.07	39	0.31 ± 0.26	10	-49.67 ± 152.13
March-May	58	-17.32 ± 16.26	55	-16.18 ± 16.96	84	-0.18 ± 0.23	11	23.09 ± 157.95
June-August	35	-19.18 ± 18.71	26	-20.63 ± 19.45	52	0.13 ± 0.25	11	23.69 ± 141.60
Sept.-Nov.	31	00.00 ± 00.00	26	00.00 ± 00.00	33	00.00 ± 00.00	9	00.00 ± 00.00
Year of calving								
1974-1977	34	29.42 ± 20.41	31	9.67 ± 22.01	21	1.21 ± 0.32	12[b]	538.79 ± 123.92
1978-1979	24	13.79 ± 21.42	23	4.11 ± 22.03	29	0.63 ± 0.27		
1980-1982	18	66.42 ± 23.00	16	64.69 ± 23.74	26	0.97 ± 0.25	14	-10.88 ± 124.48
1983-1984	33	29.55 ± 20.36	32	12.36 ± 20.40	20	0.56 ± 0.26	15[c]	00.00 ± 00.00
1985	34	33.63 ± 20.43	27	34.05 ± 21.53	34	0.15 ± 0.21		
1986-1987	21	00.00 ± 00.00	16	00.00 ± 00.00	78	0.00 ± 0.00	-	-
Parity								
1	59	8.77 ± 18.19	52	17.08 ± 19.79	46	-0.40 ± 0.26	-	-
2	40	23.74 ± 18.47	35	28.89 ± 19.61	57	-0.44 ± 0.24	-	-
3	25	13.00 ± 20.15	23	17.20 ± 20.46	39	-0.51 ± 0.24	-	-
4	16	8.70 ± 22.63	14	16.99 ± 22.93	25	-0.60 ± 0.26	-	-
5 and over	24	00.00 ± 00.00	21	00.00 ± 00.00	41	0.00 ± 0.00	-	-

* Solutions as estimated differences from the last group of each factor.

a Seasons and years of birth were used instead of seasons and years of calving.

b Included all animals born during 1974-1979.

c Included all animals born during 1983-1985.

Table 4. Coefficients of variation and repeatability estimates of some economic trait of Sharabi cattle.

Trait	Coefficient of Variation (%)	Repeatability estimates
Total milk yield	56.0	0.263
Lactation period	42.5	0.213
Dry period	41.4	0.312
Calving interval	17.3	0.001
Days open	49.4	0.143
Services per conception	73.6	0.313
Age at first calving	33.3	-

Table 2 reveals non-significant effects on parity and season of calving on all traits included in this study. The non-significant parity effect may be attributed partially to the fact that for animals with available information concerning their age at first calving, this age was high relatively (Table 3). For others which were originally bought from local market, their parity sequence might have been underestimated. Nevertheless, the non significant parity and season of calving effects on traits studied here are in partial agreement with those reported earlier by Haddad (1981) and Maarof et al. (1987).

Estimates of coefficients of variation and repeatabilities are presented in Table 4. The coefficients of variation were all high except for calving interval. Moreover, coefficients for both milk yield and lactation period were higher than those obtained for the Friesian at the same farm (Mahmoud, 1988). Repeatability estimates ranged from low to medium in value indicating the

importance of the non-genetic factors. The combination of both estimates, coefficient of variation and repeatability warrants the possibility of improving milk production in Sharabi cattle.

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دراسة أداء الأبقار الشرابية

ملخص :

إستخدمت طريقة ال Maximum likelihood في التحليل الإحصائي للسجلات الخاصة بإنتاج الحليب الكلي طول موسم الحليب وفترة الجفاف وفترة ما بين ولادتين وفترة ما بين الولادة والإخصاب والعمر عند أول ولادة وعدد التلقيحات اللازمة للإخصاب والعائدة للأبقار الشرابية في محطة الرشيدية - محافظة نينوي - الكائنة في شمال العراق . بلغ متوسطاتها ٨٤ر٨٢٠ كغم و ١٨ ر ١٦٠ يوما و ٠٨ ر ٢٥١ يوما و ٢٠ ر٤٠٩ يوما و ٤٧ر ١٤٤ يوما و ٧٣ ر ١١٥٧ يوما و ٦٤ر١ على التوالي .

كما وأظهرت النتائج معنوية تأثير سنة الولادة على كل من إنتاج الحليب الكلي وطول موسم الحليب وفترة الجفاف وعدد التلقيحات اللازمة للإخصاب (١ <١ر٠) وفترة ما بين الولادة والإخصاب (١<٠٥ر٠) . أما تأثير كل من فصل الولادة وتسلسلها على الصفات المدروسة فلم يكن معنويا