PERFORMANCES OF BROWN SWISS AND FRIESIAN CATTLE IN CENTRAL IRAQ

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SUMMARY

Records collected on 272 Brown Swiss (BS) and 273 Friesian cows maintained over 1978-1987 at the Wahda State Farm in central Iraq, were analysed by the Maximum Likelihood method. The cows were originally imported as pregnant heifers from Austria and Denmark respectively.

In the BS and F 30-, 60-, 90- and 120-day milk yield averaged 328.4, 365.8 kg ($P<0.01$); 655.7, 692.1 kg; 1029.8, 1105.4 kg; and 1319.4, 1361.8 kg, with heritability estimates of 0.15, 0.174; 0.25, 0.417; 0.471, 0.473; and 0.494, 0.47 respectively. Age at first calving, lactation period, calving interval, service period and dry period averaged 33.3, 28.1 months ($P<0.01$); 320.8, 320.3 days; 418.97, 414.1 days; 138.2, 145.5 days; and 101.3, 102.2 days, with heritability estimates of 0.21, 0.219; 0.011, 0.07; 0.037, 0.027; 0.023, 0.004; and 0.07, 0.006 in the same order.

INTRODUCTION

The Friesian and other dairy cattle breeds were imported to Iraq since the 1940s to be raised as purestock and to grade the native cows. The Brown Swiss, however, was the last to be introduced, namely in 1982. This communication describes the performances of Brown Swiss and Friesian cows under the same farm conditions in central Iraq.

MATERIAL AND METHODS

Records collected on 272 Brown Swiss (BS) and 273 Friesian (F) cows maintained over 1978-1987 at the Wahda State Farm in central Iraq, were analysed in an attempt to study some of their dairy traits, together with the effects of some non-genetic factors on part lactation yields of heifers. The farm which is one of the largest in Iraq was established in 1976 with pregnant Friesian heifers from Denmark. In 1982 pregnant BS heifers and bulls were imported from Austria and maintained at the same farm.

Animals are housed in closed barns facilitated with evaporative cooling. Cows are inseminated artificially, and milked mechanically twice a day. Feeding varies with seasons depending on feedstuffs available. Lucerne, barley and sorghum (green or hay) and a concentrate mixture of ground barley, wheat bran, soyabean meal and salts (16% crude protein, 12% digestible protein) are offered.

The Maximum Likelihood method (Schaeffer, 1976) was employed in the

estimation of the fixed effects in the mathematical model, and of the components of variance. The heritability of traits studied was estimated by the paternal half-sib method. The t-test (Snedecor and Cochran, 1967) was applied to test the significance of differences between means.

RESULTS

BS heifers freshened 5.2 months later than their F contemporaries ($P<0.01$), while breed differences in lactation period, calving interval, service period and dry period lacked significance (Table 1).

The F surpassed the BS in part lactation milk yield in their first lactations (Table 2); the difference being significant only in respect to 30-day milk yield (Table 3). Highest and lowest yields were produced by winter and summer calvers respectively ($P<0.01$) (Tables 2 and 3). The effect of age at first calving on first lactation 30-, 60- and 120-day milk yields lacked significance (Table 3). Whereas, the regression of 90-day yield on this age (17.6 kg/month) was significant ($P<0.05$) (Tables 2 and 3).

The heritability of part lactation records ranged between 0.15 and 0.494, and of that of age at first calving was 0.21 in the BS and 0.219 in the F (Table 4). The heritability of the remaining traits ranged between 0.006 and 0.07.

DISCUSSION

Results reveal that performances of both breeds are very similar and that the BS which is being tested here for the first time, is a promising dairy breed for central and northern Iraq. Delayed freshening of BS heifers in comparison with the F and most dairy cattle breeds is common (Rosa et al. 1968; Schneeberger, 1974). Service period in the F is much longer than the estimate (82.2 days) reported on the breed in the USA (Olds and Cooper, 1970). This period in dairy cattle increases in tropical and subtropical countries including Iraq where it varies between 157.3 and 212 days (Telloo, 1978; Babona, 1981). Dry period in the F is almost double that quoted (54.3-78.3 days) for the breed in some temperate countries (Brabander et al. 1972; Cobic et al. 1981). Such differences can be attributed to varying dry periods and environmental factors that affect the duration of lactation period and calving interval.

In view of the close relationship between part and total lactation records in dairy cattle (Juma et al. 1970) and the high heritability estimates of 90- and 120-day milk yield in both breeds (Table 4), these part records would be suitable criteria for efficient selection of cows for high milk production. Slight differences between the two breeds in part lactation yields, however, are due to genetic differences between them, and seasonal variation in such records may be attributed to seasonal changes in

Table 1 Dairy characteristics

	Brown Swiss	Friesian
Age at first calving, month	33.31±0.20a(258)	28.14±0.20b(272)
Lactation period, day	320.81±4.22a(336)	320.25±2.61a(704)
Calving interval, day	418.97±4.12a(336)	414.09±2.82a(704)
Service period, day	138.19±4.04a(336)	145.54±2.85a(704)
Dry period, day	101.30±4.59a(336)	101.22±2.86a(704)

Figures within parentheses represent the number of observations
Like letters denote no significant differences between means otherwise they differ sigificantly (P<0.01)

Table 2 Least squares estimates ± S.E. for factors affecting first lactation partial milk yield (kg)

	No.	30-day	60-day	90-day	120-day
Overall mean	475	347.1± 7.4	673.9±13.2.	1067.6±21.6	1340.6±5.0
Breeds					
Brown Swiss	217	-18.7±6.4	-18.2±11.7	-37.8±47.0	-21.2±48.9
Friesian	258	18.7±8.1	18.2±14.4	37.8±58.7	21.2±63.4
Season of calving					
Winter (12-2)	52	96.9±12.5	169.4±21.7	295.2±89.2	263.0±98.4
Spring (3-5)	90	-9.6±10.2	2.0±17.8	-19.7±72.7	19.4±79.4
Summer (6-8)	179	-51.1± 6.3	-100.9±11.2	-143.3±45.4	-162.6±49.2
Autumn (9-11)	154	-36.2± 7.3	-70.5±12.8	-132.2±52.3	-119.8±56.9
Age atfirst calving	475	2.2± 1.2	3.7± 2.0	17.6± 8.4	13.7± 9.3

Table 3 Analysis of variance for factors affecting first lactation partial milk yield

Source of Variation	d.f.	30-day	60-day	90-day	120-day
Breed	1	61313.37xx	48758.92	219663.06	79390.99
Season of calving	3	196273.49xx	579566.23xx	1606850.70xx	1579595.90xx
Age at first calving	1	19163.18	47255.04	1068352.70x	694043.49
Remainder	469	5278.27	14035.68	242852.41	321102.96

x P<0.05, xx P<0.01

Table 4 Heritability estimates

Traits	Brown Swiss	Friesian
Age at first calving	0.210	0.219
30-day milk yield	0.150	0.174
60-day milk yield	0.250	0.417
90-day milk yield	0.471	0.473
120-day milk yield	0.494	0.470
Lactation period	0.011	0.070
Calving interval	0.037	0.027
Service period	0.023	0.004
Dry period	0.070	0.006

atmospheric temperature, quality and quantity of feeds

The very low heritability of most of the traits studied denote to the great role played by the environmental factors in the variation of the trait, Raising the standards of feeding and management, and the full use of all information available on the pedigree and collateral relatives will lead to the improvement of these traits and milk yield as well.

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