

Milk and meat performance of Egyptian baladis and their crosses  
with European cattle

Rendimiento, en leche y carne, del ganado egipcio Baladi y de sus  
cruzas con razas europeas

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In 1976 a crossbreeding experiment between Egyptian Baladi cows and Central European cattle was started. The Baladi cows were collected from farms of the lower Delta region and brought to a large government farm (North Thareer). The cows were inseminated by semen of 6 bulls each of the Red Angler (RA), German Brown (BV), of a cross German Brown x Brown Swiss (F<sub>1</sub>) (BC), Friesians F and Baladis B and of 3 bulls of the South Tyrolean Grey (G). The Friesian and the Baladi bulls were bred locally, the semen of the bulls of the other breeds was imported (breed information: I.L. Mason, A world dictionary of breeds..., CAB, 1957).

When the cows had calved the male progeny was fattened on concentrate, clover and rice straw and slaughtered, one third of each type, at 12 months, or 15 months, or 18 months, respectively. The female progeny was raised at the farm and bred with a bull of their sire's breed at the first heat after they had reached 15 month of age. In addition, 10 locally bred Friesian and 5 buffalo heifers were brought in from another farm. About one fourth of the cows with first lactations have a 2<sup>nd</sup> lactation part record (100 days).

The fattening and slaughter traits were analysed by a model which included breed of sire, age at slaughter and interaction between the two factors which reached significance for one trait, empty body weight, only. The statistical model employed for lactation records included breed of sire and season of calving.

Results and discussion

As evident from table 1 the crossbreds grew better than the Baladis, while differences between crossbreds were small the dressing percentage favored again crossbreds but among them those with dual purpose sires (BV, G, F) were superior to progeny of dairy type bulls (RA, BC). The same tendency is evident in most other slaughter traits although the offspring of BC bulls compare favorably for some traits such as meat/bone in rear quarter.

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Table I

## Beef merit of Baladis and crossbreds

$\mu$	n	bw <sup>1)2)</sup> kg	ccw <sup>1)</sup> kg	%k	hqm <sup>1)</sup> kg	hqb <sup>1)</sup> kg	m/b	ft <sup>1)</sup> cm
B	25	334	174	53.6	37.0	6.95	5.32	3.16
RA	22	375	203	54.1	41.9	8.15	5.14	2.39
BV	24	386	210	54.4	44.4	8.22	5.40	1.92
BC	24	397	216	54.4	44.7	8.42	5.31	2.79
G	11	382	213	55.8	43.9	8.17	5.37	2.09
F	17	381	198	52.0	41.5	7.8	5.31	2.43
$s_{\bar{x}}$		10-15	6-9		1.3-2	.3-.5		.3-.5

1) LSQ means

2) mean of 3 age groups

bw = body weight, mean of age groups

ccw = cold carcass weight

%k = ccw/bw

hqm = hindquarter meat (includes intermuscular fat)

hqb = hindquarter bone

m/b = hqm/hqb

ft = fat thickness of 3-rib cut

$s_{\bar{x}}$  = appt. standard error of LSQ means

Table II

## Dairy performance of crossbreds, Baladis, pure Friesians and buffaloes

	n	weight at 1 <sup>st</sup> calving <sup>1)</sup> kg	305-day yield <sup>1)</sup> kg	dm <sup>2)</sup>	$\Delta$ <sup>1)</sup> kg	(n)
B	9	261	365	8.8	74	7
RA	20	319	1769	37.2	331	13
BV	16	305	1355	29.3	253	7
BC	16	298	1748	38.4	211	8
G	7	317	1325	28.0	190	4
F	13	324	1300	27.0	160	3
F pure	10	324	1756	36.5	-	
Buffaloes	5	441	1556	26.3	-	
$s_{\bar{x}}$		10 - 13	103 - 209			

1) LSQ means

2) dm - dairy merit  $\frac{305\text{-d yield}}{W^{2/3}}$

F pure purebred Friesians

$\Delta$  increment 1<sup>st</sup> to 2<sup>nd</sup> lactation in 100-day milk yield

(n) number with 2<sup>nd</sup> part lactations

$s_{\bar{x}}$  standard error of LS mean

In Table 2 the dairy data are given. The superiority of the crossbreds and of pure Friesians is comparatively much greater than for beef traits; outproducing the Baladis four to five fold. It is noteworthy that yields of crossbred progeny of dairy type sires (RA, BC) approach and even surpass the performance of purebred Friesians. Also the excellent performance of buffaloes becomes apparent. Unfortunately, milk composition could not be analysed regularly but the fat content of buffalo milk is known to be much higher than for cow milk which must be considered when the various types are to be evaluated on an economic basis.

The low performance of the Baladis must be attributed to a large degree to their short and variable lactation length which is quite similar to Zebus even though Egyptian Baladis are largely *bos taurus* (H. Epstein, The origin of the domestic animals of Africa I, Afric. Publ. Co., NY, 1971). The lactation lengths of progeny of dairy type sires and of pure Friesians, and of Buffaloes are somewhat longer than those of dual purpose offspring.

The increments of 1<sup>st</sup> to 2<sup>nd</sup> lactation are much larger in offspring of European cattle than in Baladis which favors the 2<sup>nd</sup> lactation of crossbreds even more than the first lactation.

Brody has suggested to estimate dairy merit by the ratio of milk to body weight or to metabolic body weight. This measure should be closely related to feed efficiency and it indicates, too, the superiority of crosses to Baladis.

The comparison of the F<sub>1</sub> Friesian x Baladi with the average of the two parental breeds permits a first estimate of the possible extent of heterosis. In both milk yield and lactation length the heterosis increment is large, it approaches 25%  $\left[ \frac{(1300 - \frac{365+1736}{2})}{1060} \right]$  for milk yield. It appears that it is largely caused by the near normal lactation length in the crossbreds caused largely by restoration of milkability. In this respect the results resemble those of Swiss Brown x Zebu crosses (P.N.R. Nair, Evolutionary crossbreeding as a basis for cattle development in Kerala State, 1973, Doct. Th., Vet. Med. Fac., Univ. Zürich).

The ranking of the breeds in respect to beef and dairy merit follows the expectation on account of their known performance in Europe. In beef merit the crossbreds out of dual purpose sires (German brown, South Tyrolean Grey, Friesians) are superior to crossbreds from dairy sires (Red Angler, F<sub>1</sub> BV x BS) even though progeny of F<sub>1</sub> BV x BS bulls are in several traits nearly equal to dual purpose offspring. In case of dairy merit the ranking is reversed, the crossbred offspring of dairy sires outproduce the others and are equal in performance to purebred Friesians. Progeny test results for milk yield in Europe were available from 15 sires. The within breed of sire correlation between progeny averages in Europe and in Egypt was 0.44 significantly different neither from 1 nor from 0. In general it appears that in spite of large environmental differences, genotype (breed or sire) x region (Egypt vs. Europe) interaction appear not to be very important.

### Summary

In 1976 an evaluation of genetic resources for Egypt was started by inseminating some 500 Egyptian Baladi cows with semen of 6 Red Angler, 6 German Brown, 3 South Tyrolean Grey, 6 Friesian bulls and 6 F<sub>1</sub> bulls German Brown x Brown Swiss. For controls one sixth of the females were inseminated with Baladi bulls. The male progeny was fattened and slaughtered at 12 months, or 15 months, or 18 months of age. The female progeny were bred with bulls of their sire's breed. The growth and fattening traits were analysed by a model including breed of sire, age at slaughter and interaction between the two factors which failed to reach significance for any of the traits. The model employed for lactation records included breed of sire and season. Fat content of milk was measured twice during the lactation and no correction was applied. Milk yield was measured daily. One fourth of the cows has a 100 day record of 2<sup>nd</sup> lactation milk yield. In this experiment F<sub>1</sub> progeny of Baladis with some European breeds are nearly as good or even slightly better than the yield of pure European cattle and heterosis for milk yield is substantial reaching nearly 40 % of the parental mean (Baladi x Friesian vs. pure Baladis and pure Friesians).

### Resumen

En 1976, se comenzó en Egipto una evaluación de recursos genéticos por medio de la inseminación artificial de 500 vacas de la raza Baladi, con semen de 6 toros de la raza Red Angler, 6 de la raza German Brown, 3 de la raza South Tyrolean Grey, 6 de la raza Friesian, y 6 toros F<sub>1</sub> (German Brown x Brown Swiss). Como control, un sexto de las hembras fue inseminado por toros de la raza Baladi. Los novillos obtenidos con dichos cruces fueron engordados, y la matanza se realizó a los 12, 15 ó 18 meses de edad. Las novillas fueron cruzadas con toros pertenecientes a la raza del padre. La producción de leche fue medida diariamente. Un cuarto de las vacas contó con un registro de 100 días para el rendimiento lácteo de la segunda lactancia. En esta evaluación, el rendimiento de la progenie F<sub>1</sub> de la raza Baladi con algunas razas europeas fue tan bueno como el del ganado europeo, y aún levemente mejor. La heterosis para la producción de leche alcanza aproximadamente el 40 % del promedio de los padres (Baladi x Friesian vs. Baladi puros y Friesian puros).