COMPARISON OF BELMONT RED AND BONSMARA CATTLE IN THE REPUBLIC OF SOUTH AFRICA : AN UPDATE

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SUMMARY

Progeny of Belmont Red and Bonsmara sires have been compared in four diverse environments in the Republic of South Africa. There were no breed differences for birth weight, preweaning gain or weight for age at 18 months. Sire differences for all traits were small with the exception of one outstanding Bonsmara bull. The experiment was also designed to estimate sire x environment interactions. In a subset of the data, there were no sire x herd-year interactions nor sire x year interactions for birth weight or preweaning gain, and it was therefore concluded that there were no sire x environment interactions. Further data from the second phase of the experiment will allow a closer examination of interactions for these traits.

INTRODUCTION

Importation of the Bonsmara breed of cattle into Australia was recommended by the Animal Production Committee (Anon. 1979). As the genetic backgrounds of the Bonsmara and the Australian Belmont Red cattle were very similar, a comparative trial was initiated in 1981 in the Republic of South Africa to determine whether the breeds differed sufficiently to warrant the importation of the Bonsmara.

In a preliminary report, Seifert et al. (1985) found there were small but non-significant differences in the birth and weaning weights of Bonsmara (BONS) and Belmont Red (BR) sired progeny. This paper examines breed differences for birth weight, preweaning gain and weight for age at 18 months in a larger set of data, and also reports preliminary estimates of sire x environment interactions.

MATERIALS AND METHODS

Animals and location

The initial phase of this experiment, from 1981 to 1984, was conducted using semen from the six Belmont Red bulls that had been mated in

1980/81 at the National Cattle Breeding Station 'Belmont'. These bulls had been selected for a combination of high weaning weight, tick resistance, and two year old weight. A second consignment of semen from three Belmont and seven industry-bred Belmont Red bulls was used from 1985 to 1987 for the second phase of the experiment. Bonsmara semen for both phases came from sires in the state herd and industry herds.

Semen from the two breeds was used in Bonsmara and crossbred herds in four diverse environments. These environments were :

(1) Highveld - characterized by cool summers, followed by cold winters during which feed supplementation is necessary;

(2) Lowveld - where hot, humid summers and warm, dry winters are experienced; parasite challenges are high in this area and regular dipping is practised;

(3) Bushveld - features are hot summers and cool dry winters; and

(4) Kalahari - a semi arid environment, typified by hot summers, cold dry winters and a low parasite challenge.

The Belmont Red sires were used in all environments in all years. More than fifty Bonsmara sires were used overall, but in the first phase of the experiment, only a small number of Bonsmara sires were used in more than one environment.

Data analysis

Data were analysed by least squares methods to estimate effects of sire breed, year, location, sire within breed and first-order interactions on birth weight, preweaning gain and weight for age at 18 months. Preweaning data were collected from the first four calf crops while postweaning weights were from the first two crops only.

A subset of data, where progeny of five Belmont Red and two Bonsmara sires were represented over two years in three locations, was analysed separately to estimate sire effects and the sire x herd-year interaction. Additional models tested the effect of sire, year, and the sire x year interaction within herds.

RESULTS

Least squares means for herd-year groups ranged from 34.0 to 39.4 kgs for birth weight, 0.601 to 0.996 kg/day for preweaning gain and from 0.437 to 0.654 kg/day for weight per day of age at 18 months. Breed differences for all variables were small and non-significant (Table 1).

Table 1 Effect of breed on birth weight, preweaning gain and weight for age at 18 months (number of animals in parentheses).

	Birth Wt. (kg)	Preweaning Gain (kg/day)	Wt/Age at 18 months (kg/day)
Bonsmara	36.5 (912)	0.80 (912)	0.55 (340)
Belmont Red	36.4 (452)	0.80 (452)	0.55 (195)

Overall, sire differences for birth weight and preweaning gain were small. However, as most Bonsmara sires were confounded with herds, some of the sire differences may have been removed with herd-year effects. A subset of data, where progeny of five Belmont Red and two Bonsmara sires were represented over two years in three locations also showed small sire differences, with the exception of one outstanding Bonsmara bull (Table 2).

Table 2 Least squares mean birth weights and preweaning gains for sire progeny groups from Highveld, Lowveld and Kalahari for 1983 and 1984.

Sire	Number of Progeny	Birth Wt. (kg)	Preweaning Gain (kg/day)
BR 12	25	38.2	0.76
BR 13	39	39.7	0.82
BR 80	40	38.1	0.83
BR 189	24	39.0	0.80
BR 487	26	35.8	0.81
BONS 11	40	38.4	0.82
BONS 100	28	41.0	0.89
s.d.		4.4	0.09

Overall, sire x herd-year interactions for birth weight and preweaning gain were small and non significant. Similarly, the data set consisting of progeny of five Belmont Red and two Bonsmara sires showed no sire x herd-year interaction. Additional models testing sire x year within herds showed no significant sire x year interaction.

DISCUSSION

Assuming that differential heterotic effects did not affect the breed comparison, these data indicate that there are very small differences in growth rate between the Bonsmara and the Belmont Red, and that the variation within breeds is larger than that between the breeds.

Although the genetic bases of the Belmont Red and Bonsmara were similar, the failure to detect differences between the breeds is surprising, for the following reasons:

- the very small (5 bulls and 2 cows), inbred sample of Afrikanders imported into Australia in 1953, which was used as the basis of the Belmont Red breed;

- the difference in time when the Hereford and Shorthorn parental breeds were sampled, the Bonsmara breed being established in the early 1940's while the Belmont Red was developed from crosses made in 1954; and

- the difference in time and emphasis of selection in the two breeds. In recent years Bonsmara breeders have favoured central test performance with selection pressure directed at feed efficiency while Belmont Red breeders have used on-farm grassfed performance testing with weight for age at 18-24 months considered the major selection criterion.

As there were no sire x herd-year interactions nor sire x year interactions for birth weight and preweaning gain, it was concluded that there was no sire x environment interaction for these traits. However, confounding of sires and herd-year may have affected the estimate of any sire x environment interaction. Therefore the second phase of this experiment, yet to be completed, was designed specifically to estimate the interaction through the use of more sires in all environments.

Based on these results, it would be difficult to justify the importation of the Bonsmara breed into Australia to increase the growth performance of Australian beef herds. Nevertheless a final conclusion should await further data on carcase traits, tick resistance, feed lot performance and fertility which will be collected in the future.

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