labour intensive and inaccurate, offers promise in such investigations. Conclusions should be checked through controlled stocking rate trials in which representative samples of a few selected 'breeds' are formed at a range of feeding levels. It is proposed to use one experimental location to consider this question.

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# POST WEANING GROWTH AND CARCASS CHARACTERISTICS OF CHIANINA, BRAHMAN AND HEREFORD CROSS AND HEREFORD STEERS IN SOUTHERN QUEENSLAND

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With the tendency for beef animals to be kept to heavy weights to satisfy export demand and to combat high processing costs, an animal producing a heavy weight carcass (>300 kg) without excessive fat cover would seem desirable. For this reason the larger European breeds have attracted considerable interest for cross breeding. The largest of these breeds is the Chianina. However, there is very limited information on the potential of the Chianina breed in Australia and especially in tropical Australia.

In this study, the post weaning growth of 281 Chianina x Hereford (CC.HH), Chianina x (Brahman x Hereford) (CC.BH), Brahman x Hereford (BB.HH), Hereford x (Brahman x Hereford ) (HH.BH) and Hereford (HH.HH) steers was studies over three years. The steers were the progeny of 8 Hereford, 6 Brahman and 4 Chianina sires. Representative animals were slaughtered at mean ages of about 880 and 1000 days and carcass characteristics examined according to the requirements of the Australian Beef Carcass Appraisal System. The study was conducted at "Sunnyholt" a commercial property 180 km north of Roma, Queensland. The steers grazed improved brigalow (*Acacia harpophylla*) country at a stocking rate of 0.8 beast $ha^{-1}$. The property is free of cattle ticks.

Analysis of variance was used for liveweight, daily gain from weaning to 880 days, and carcass data to isolate the effects of genotype, draft and their interaction. Pairwise differences between genotypes were tested using Student's t-test. The interaction of genotype by draft was significant for initial weight, hot carcass weight and carcass length. For these parameters results are presented separately for each draft (Tables 1 and 2).

TABLE 1: Growth Rates of Five Genotypes from Weaning to 880 days

| Genotype | No. of Animals | | Initial Wt. (Kg) | | Average Daily Gain (kg.day$^{-1}$) | | |
|---|---|---|---|---|---|---|---|
| | Draft 1 | Draft 2 | Draft 1 | Draft 2 | Yearlings | 2 Year Olds | Overall |
| CC.HH | 30 | 30 | $213.0^{a}$ | $246.5^{a}$ | $0.61^{a}$ | $0.55^{a}$ | $0.58^{a}$ |
| CC.BH | 26 | 30 | $227.7^{b}$ | $253.6^{a}$ | $0.62^{a}$ | $0.50^{b}$ | $0.57^{ba}$ |
| BB.HH | 26 | 24 | $216.4^{ab}$ | $220.3^{b}$ | $0.65^{b}$ | $0.43^{c}$ | $0.55^{b}$ |
| HH.BH | 26 | 30 | $227.7^{b}$ | $229.6^{b}$ | $0.54^{c}$ | $0.45^{c}$ | $0.50^{c}$ |
| HH.HH | 29 | 30 | $212.2^{a}$ | $198.5^{a}$ | $0.52^{c}$ | $0.45^{c}$ | $0.49^{c}$ |
| SD | | | 23.8 | 23.8 | 0.07 | 0.08 | 0.05 |

Means in the same column with a letter in common do not differ significantly $P < 0.05$

TABLE 2: Carcass Characteristics of Five Genotypes

| Genotype | No. of Animals | | Hot Carcass Wt. (kg) | | Length (cm) | | Fat Depth (mm) | Eye Muscle (cm$^{2}$) | Total Points ABCAS |
|---|---|---|---|---|---|---|---|---|---|
| | Draft 1 | Draft 2 | Draft 1 | Draft 2 | Draft 1 | Draft 2 | | | |
| CC.HH | 18 | 25 | $294.3^{a}$ | $319.9^{a}$ | $114.8^{a}$ | $118.4^{a}$ | $6.56^{a}$ | $78.7^{a}$ | $67.9^{a}$ |
| CC.BH | 18 | 25 | $294.5^{a}$ | $317.4^{a}$ | $115.0^{a}$ | $118.7^{a}$ | $7.03^{a}$ | $80.8^{a}$ | $70.8^{a}$ |
| BB.HH | 25 | 22 | $291.4^{a}$ | $290.3^{b}$ | $111.0^{b}$ | $111.3^{bc}$ | $11.57^{b}$ | $68.0^{bc}$ | $57.2^{b}$ |
| HH.BH | 19 | 22 | $271.8^{b}$ | $283.8^{b}$ | $110.8^{b}$ | $111.8^{b}$ | $10.16^{bc}$ | $69.6^{c}$ | $62.7^{c}$ |
| HH.HH | 25 | 22 | $256.3^{c}$ | $263.8^{c}$ | $108.8^{c}$ | $109.8^{c}$ | $9.63^{c}$ | $65.2^{b}$ | $60.6^{bc}$ |
| SD | | | 19.5 | 19.5 | 3.1 | 3.1 | 3.58 | 8.0 | 8.7 |

Means in the same column with a letter in common do not differ significantly $P < 0.05$

From weaning to yearling age (600 days) BB.HH steers gained significantly ($P < 0.05$) faster than CC.HH and CC.BH steers which gained faster ($P < 0.05$) than the HH.BH and HH.HH groups. From yearling to two year old (880 days) both Chianina groups gained faster than the remaining three genotypes ($P < 0.05$). The CC.HH steers gained faster than the CC.BH group ($P < 0.05$). Overall gains showed a graduation in performance with Chianina crosses superior, the HH.BH and HH.HH steers inferior and the BB.HH group intermediate ($P < 0.05$).

Overall, the Chianina crosses produced the heaviest carcasses, the Herefords produced the lightest and the BB.HH and HH.BH groups were intermediate ($P < 0.05$). Fat cover over the eye muscle was greatest in the BB.HH group, least in the Chianina crosses and intermediate in the HH.HH and HH.BH groups. Carcass length and eye muscle area tended to mirror carcass weight. This study found that the growth of Chianina x Hereford crosses was 18% better than the growth of Hereford steers. By comparison, the Brahman x Hereford steers grew 12% better than Hereford steers.

The superior performance of the Chianina cross animals was a reflection of their greater potential for growth, later maturity and slower rate of fat deposition. Lower subcutaneous fat levels on the Chianina carcasses, despite heavier carcass weights, bear out this argument.

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## CONTROLLING INFLUENCE OF FOETAL GENOTYPE ON BOVINE GESTATION LENGTH

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Several years' data on 127 calves resulting from egg transfer operations, and born at a single location ("Bushfield", Finley, in southern N.S.W.) under the same management were analysed under a fixed model, ignoring year effects. This can be justified as cattle were grazed on irrigated pastures, and variation within years would be expected to be as great as that between years.

A least-squares computer program package (Harvey, 1977) was used, with main effects being genotype (breed or cross) of calf, parity (0,1,> 1) of recipient dam, and apparent predominant breed of recipient dam.

Pregnancies were allowed to go to term. Caesarean sections were sometimes performed on an elective basis, but only after the cow entered into labour. Earlier experience on elective caesars before the onset of calving, to suit human convenience, involved problems with many calves having difficulties in respiration and/or showing no interest in suckling, for periods of up to several days after the caesarean.

The usual parity effect on gestation length was manifested. Most recipients were of dairy breeds, and most calves were purebred Charolais or Simmental. Gestation lengths, and birth weights, were typical of those for cows of the same genotype as the calf. That is, in agreement with French and Argentine researchers (discussion in Joandet, 1977), the calf's birth weight and the gestation length of the recipient cow were apparently entirely determined by the phenotype of the calf. The calf's phenotype in turn is determined by its genotype and by the maternal environment available to it, which is where age and parity effects (of the recipient dam) are exhibited.