

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

K.A. Rathie

Department of Primary Industries, Newstead, Queensland, 4006

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.

For comparison purposes, gestation lengths and calf birth weights were available for several of the donor cows, sometimes for several pregnancies per cow.

Some large calves out of small dams appeared for a couple of days after birth to be a little slower to move about than calves from larger dams, possibly due to the former group having been somewhat cramped in the late pre-natal period.

REFERENCES

- HARVEY, W.R. (1977) User's guide for LSML76. Mixed model least-squares and maximum likelihood computer program - Ohio State University; November 1977
- JOANDET, G.E. (1977). Crossbreeding research in South America. In "Crossbreeding Experiments and Strategy of Beef Utilization to Increase Beef Production," pp.155-173 (Verden Seminar, February 1976; Editors, I.L. Mason & W. Pabst). Commission of the European Communities: Luxembourg.

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GENETIC CORRELATION BETWEEN HEAT TOLERANCE AND FERTILITY IN BEEF COWS

H. G. Turner

CSIRO Tropical Cattle Research Centre,
Rockhampton, Qld, 4700.

The effect on growth of reducing heat stress in the field, and the phenotypic regression of growth on body temperature, have been estimated in British-breed cattle (Turner, 1962). By extrapolation, a part of the superior performance of Zebu crosses can be attributed to their heat tolerance. There remains a question whether the heat tolerance of Zebu crosses is beyond the threshold for effects on performance in this environment. This paper reports covariation of body temperature and fertility in cows within different breeding lines.

MATERIAL

Observations were made on the herd of over 1100 cows at the National Cattle Breeding Station, "Belmont", Rockhampton, in 1976 and 1977. The results here are for lines of British breeding (Hereford-Shorthorn) and of Zebu crossbreds (each F_2 $\frac{1}{2}$ -breds derived from Brahman, Africander, or Sahiwal bulls and Hereford/Shorthorn cows). Rectal temperatures were recorded in March-April, following mating in single-sire families for 7 weeks in January-February. At the rate of 60-70/hr, readings took several days, and conservative corrections for major environmental variations were applied. The mean numbers of readings/animal were 1.2 (1976)