

A COMPARISON OF ZEBU CROSS AND SHORTHORN STEERS GROWN IN THE CHANNEL COUNTRY OF SOUTH WEST QUEENSLAND

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SUMMARY

The comparative growth rates from August 1983 to June 1986 and carcass characteristics at slaughter in June 1986 of 59 Zebu cross and 59 Shorthorn steers that grazed Channel Country pastures in south west Queensland were studied. The Zebu cross steers were younger (7 v. 9 months) and lighter (195 v. 221 kg, $P < 0.05$) at commencement, had slightly lower final liveweight (571 v. 579 kg, $P > 0.05$), higher liveweight gain (376 v. 358 kg, $P < 0.05$), heavier carcass weight (311 v. 306 kg, $P > 0.05$), higher dressing percentage (54.5 v. 52.8%, $P < 0.05$) and lower P8 rump fat depth (13.0 v. 17.6 mm, $P < 0.05$) than the Shorthorn steers.

Keywords: Channel Country, steers, genotypes, productivity, specifications.

INTRODUCTION

British breeds, especially Shorthorns, have been the traditional beef breeds used in the Channel Country of south west Queensland. These cattle have been marketed between 3 and 6 years of age when carcass weights ranged from 300 to 400 kg.

Management is extensive in the Channel Country where the area of properties is up to 12 000 km² and stocking rates 1 beast to 0.3–0.6 km². One to 2-year-old store steers brought down from northern breeding properties for fattening are rarely handled again before being remustered for sale 1 or 2 years later.

Beef cattle of Zebu origins have faster growth rates and lower rates of breeder mortality than British breeds in northern Australia (Turner 1975; Winks 1984). This has encouraged a change from British breeds to Zebu crosses in northern Australia. A similar trend is reflected in cattle fattened in the Channel Country.

The higher-priced market for Channel Country steers is the Japanese grass-fed category of either chilled or frozen, full sets of primal cuts. Carcass weights need to be 300–420 kg and P8 rump fat depth 7 to 22 mm (AUS-MEAT fat scores 3 and 4).

No experimental work has been reported on the suitability of the Zebu crosses for grazing in the Channel Country. In this paper we report on the comparative liveweight gain and carcass characteristics of 2 groups of steers, Shorthorns and interbred Zebu crosses derived from Zebu, British and large European breeds.

MATERIALS AND METHODS

During August 1983, 59 Zebu cross steers ($\frac{5}{8}$ Zebu, $\frac{1}{4}$ European and $\frac{1}{8}$ British) were weaned at Bulloo Downs, Thargomindah. The derivation of these crossbreeds was such that the hybrid vigour component was minimal. Concurrently 59 Shorthorn steers were also weaned. Station records indicated that the average ages of the Zebu crosses and Shorthorns were 7 and 9 months, respectively. The steers were tagged and weighed after an overnight fast (no feed and water) and then grazed together, with 2000 similar steers, from 23 August 1983 to 17 June 1986.

On 17 June 1986, the experimental steers were mustered and weighed after an overnight fast. The steers were transported 320 km by road to Quilpie where they were fed, watered and rested for 1 day prior to being railed 1320 km to an abattoir at Beaudesert. Then they were rested for 2 days, with access to water, and slaughtered on 24 June 1986.

Individual hot carcass weights, subcutaneous fat depths, conformation and bruising were recorded for all carcasses. Dressing percentage was calculated as the trimmed hot carcass weight as a percentage of the final liveweight at Bulloo Downs. The depth of subcutaneous fat was measured at the P8 rump site, as described by the Authority for Uniform Specification Meat and Livestock (AUS-MEAT) (Anon. 1987).

The liveweight and carcass data were analysed using analysis of variance procedures for orthogonal data.

RESULTS

The Zebu crosses were lighter ($P < 0.05$) initially and gained 18 kg more ($P < 0.05$) than the

Table 1. The comparative age, liveweight gain and carcass characteristics of Zebu cross and Shorthorn steers grazing Channel Country pastures

	Zebu cross	Shorthorn	l.s.d. ($P = 0.05$)
Number of animals	59	59	—
Weaning age (months)	7	9	—
Initial liveweight (kg)	195a	221b	12.7
Final liveweight (kg)	571	579	19.5
Liveweight gain (kg)	376a	358b	17.8
Carcass weight (kg)	311	306	12.1
Dressing percentage (%)	54.5a	52.8b	0.007
Fat depth – P8 rump site (mm)	13.0a	17.6b	1.8
Means in the same rows followed by a different letter differ significantly ($P < 0.05$).			

Table 2. Percentages of carcasses of Zebu cross and Shorthorn steers within different general carcass weight and P8 fat depth categories

(Premium market for > 299 kg carcass weight and 7-22 mm fat depth)

Carcass weight (kg)	Fat depth (mm)					
	< 7	7 to 22	> 22	< 7	7 to 22	> 22
	<i>Zebu cross</i>			<i>Shorthorn</i>		
< 280	0	18.6	0	0	11.9	1.7
280 to 299	0	13.6	3.4	0	28.8	5.1
> 299	3.4	59.3	1.7	0	45.8	6.8

Shorthorns over the 1030 days of the experiment. The difference in initial liveweight may have been related to the difference in weaning age (Table 1).

Although carcass weights were not significantly different ($P < 0.05$), Zebu crosses had a higher ($P < 0.05$) dressing percentage than Shorthorns and had less ($P < 0.05$) fat over the P8 rump site.

The distribution of carcasses across a carcass weight X fat depth grid (Table 2) shows that a greater percentage of Zebu cross carcasses met the specifications for the premium market segment (> 299 kg carcass weight; 7 to 22 mm P8 fat) than Shorthorn carcasses (59.3 v. 45.8%). Fewer Zebu cross carcasses exceeded 22 mm P8 fat than Shorthorn carcasses (5.1 v. 13.6%) despite higher average carcass weights.

DISCUSSION

Our study has highlighted production advantages of Zebu crosses over Shorthorns for beef production in south west Queensland. The 18 kg additional weight gain represents a 5% advantage which compares with 23 to 113% reported from more northern environments (Norman 1967; Winks *et al.* 1977, 1980). The smaller responses in our study may be a function of reduced nutritional stress and parasite infestation in the Channel Country relative to areas further north. While the Channel Country does experience extremes of temperature, relative humidity would normally be much lower than in the north. Generally, the greater the environmental stresses, the better the Zebu crosses perform relative to the British breeds (Winks 1984). Our 5% liveweight gain advantage is similar to that recorded at Dirranbandi in south west Queensland for $\frac{1}{2}$ Africander, $\frac{1}{4}$ Hereford, $\frac{1}{4}$ Simmental relative to Herefords (J. Cavaye, pers. comm.).

The greater percentage of carcasses from the Zebu crosses which fitted the specifications for the premium-priced Japanese grass-fed chiller market (> 299 kg carcass weight; 7 to 22 mm P8 fat) highlights a further advantage of the Zebu crosses over the Shorthorns. The greater tendency of Shorthorns to lay down subcutaneous fat resulted in more carcasses exceeding the maximum desirable P8 fat level. Primal cuts from these carcasses require additional trimming of fat to meet the specifications for the market. The lower fat depth of the Zebu cross steers was expected because both

Zebu and European genotypes have less fat cover than British genotypes at the same age (Carpenter 1973).

Using regression equations for estimating saleable beef yield from export carcasses (Ball and Johnson 1989) incorporating hot side weight and P8 fat thickness, it is obvious that the Zebu cross animals produced much more saleable beef than the Shorthorns. Johnson and Ball (1989) examined yields of saleable beef from a range of genotypes. They concluded that Brahman cross animals produced carcasses much more suited to the Japanese grass-fed chiller market than Herefords. Our data would tend to support this conclusion in relation to Zebu crosses and Shorthorns in the Channel Country.

We conclude that Zebu crosses similar to ours will grow better than Shorthorns in the Channel Country and will produce a greater percentage of carcasses which meet optimal market specifications for the Japanese grass-fed chiller market.

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REFERENCES

- ANON. (1987). **AUS-MEAT** Language, Authority for Uniform Specification Meat and Livestock. Australian Meat and Live-stock Corporation, Sydney, NSW.
- BALL, B. and JOHNSON, E. R. (1989). *Aust. J. Expt. Agric.* 29: 483-7.
- CARPENTER, Z. L. (1973). *In* 'Crossbreeding Beef Cattle Series 2'. (Eds M. Koger, T. Cunha and A. Warnick.) (University of Florida Press: Gainesville).
- JOHNSON, E. R. and BALL, B. (1989). *Aust. J. Expt. Agric.* 29: 489-96.
- NORMAN, M. J. T. (1967). *Aust. J. Expt. Agric. Anim. Husb.* 7: 217-24.
- TURNER, H. G. (1975). *Aust. Meat Res. Comm. Rev.* 24: 1-30.
- WINKS, L., LAMBERTH, F. C. and O'ROURKE, P. K. (1977). *Aust. J. Expt. Agric. Anim. Husb.* 17: 357-66.
- WINKS, L., WRIGHT, G. S. and WIGHTON, I? A. (1980). *Qld J. Agric. Anim. Sci.* 37: 189-97.
- WINKS, L. (1984). *Aust. Meat Res. Comm. Rev. No.* 45.