EFFECT OF INTENSIVE HANDLING OF ZEBU CROSSBRED WEANER CALVES ON TEMPERAMENT

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SUMMARY

To examine short and long-term effects on temperament of intensive handling, 98 zebu crossbred bull and heifer calves were confined and fed in yards for 11 days at weaning. During that time they were subjected to intensive training after which they were put into the same paddock as 96 non-handled control animals. Temperament was measured by recording each animal's Flight Speed (FS) at weaning, 6 weeks after weaning (June 1988) and 12 months after weaning (April 1989), with fast times indicative of poor temperament. Intensive training of calves had no effect on subsequent FS measurements, nor on change of FS from weaning to June 1988 or to April 1989. Animals that were fast at weaning slowed significantly more than slower animals from weaning to April 1989 ($P<0.01$) and tended to slow more from weaning to June 1988 ($P<0.10$) whether or not they had received intensive training. It is therefore suggested that animals with fast Flight Speeds be identified early in life and targeted either for culling or additional training. Temperament of zebu crossbred cattle in extensive areas of northern Australia is probably best improved by inclusion of temperament as a trait in selection programs.

INTRODUCTION

The temperament of beef cattle has been studied using a variety of different, mostly subjective scoring systems. Most studies concluded that heritabilities of temperament were generally greater than 0.4, indicating the trait should respond to selection (O'Bleness et al. 1960; Beiharz et al. 1966; Dickson et al. 1970; Stricklin et al. 1980; Hearnshaw and Morris 1984; Burrow et al. 1988). Nevertheless, Stricklin et al. (1980) still recommended that temperament not be included in selection programs, but be improved by manipulating environmental effects such as using correct handling techniques, as well as culling obviously unmanageable cattle. Their recommendation was not substantiated by scientific data demonstrating the effectiveness of such environmental manipulation. Other studies however, have shown that temperament improves with increasing age (Dickson et al. 1970; Fordyce and Goddard 1984) and this was attributed by those authors to the effect of increased handling experience with age. Those reports and others based on subjective observations have led to a general recommendation that temperament is best improved through management options such as intensive handling at weaning (Binstead 1977; Fordyce 1987). One report recommended a combination of selection and weaner training (Fordyce et al. 1988). To date though, the effectiveness of weaner training programs has not been objectively evaluated. This paper examines the short-term and longer term effects on temperament of intensive training of zebu crossbred cattle at weaning at about 180 days of age.

MATERIALS AND METHODS

Animals and management

AX (nominally 50% Africander, 25% Hereford, 25% Shorthorn) and AXBX (nominally 25% contribution from each of the Africander, Brahman, Hereford and Shorthorn breeds) bull and heifer calves were used

in this study. They were born at the National Cattle Breeding Station 'Belmont' near Rockhampton over 12 weeks from September to December 1987, and except for 70 days during the breeding season, were reared together until weaning on 26th April 1988 at about 180 days of age. Before weaning, all calves were handled on four occasions. At birth, calves were caught in the paddock, eartagged and weighed. Within a week of birth, cows and calves were yarded and dams of calves identified. All calves were again weighed at the start of the breeding season. After the breeding season, calves were weighed, branded and vaccinated. Special calf-handling facilities were used to handle calves to weaning age.

Calves were allocated randomly within genotype, sex and sire progeny group to either an intensively handled group (TRAINED) or a control group (CONTROL). At weaning all calves were weighed and drafted into treatment group using adult cattle handling facilities. At the same time, an initial temperament score was measured by the animal's Flight Speed (FS). An animals's FS is the electronically recorded time taken for the animal to cover a distance of 1.7 metres after leaving a weighing crush, with rapid times indicative of poor temperament (Burrow et al. 1988).

Weaner handling treatments

CONTROL group calves were returned to a paddock immediately after weaning and given no further training. TRAINED animals remained confined in yards for 11 days during which time hay was delivered by motor vehicle to hay racks in the yard each morning and evening. During days 1-4, animal handlers periodically moved through the yards and amongst the animals to familiarize the animals to humans. By Day 4, all but about 10% of animals approached the hay racks immediately the hay was delivered and remained there as the vehicle was driven away. From days 5-11, all animals were moved through a series of yards and crushes, were caught in head and squeeze bails and touched all over the body. If animals responded adversely to handling they were allowed to settle completely before further handling occurred. On several occasions towards the end of the training period animals were moved from the yards and taught to stop, start and move as required by stockmen on horseback. At the end of the training period, TRAINED animals were put into the same paddock as CONTROL animals.

On 2nd June 1988, about one month after the training period, all animals were mustered, weighed and FS was recorded. Animals were drafted according to sex, and were subsequently managed separately. Each month thereafter until April 1989 all animals were weighed and if cattle ticks (*Boophilus microplus*) or gastrointestinal helminths (worms) were believed present, tick and worm burdens were measured. No treatment to control ticks or worms was given to any of the animals from birth to April 1989 when the animals were about 18 months of age. At time of weighing in April 1989 FS was again recorded.

Statistical analyses

Data were analysed by least squares methods to estimate the effects of genotype, sex and weaner handling treatment on FS at weaning, June 1988 and April 1989 and on the change of FS from weaning to June 1988 and to April 1989. Age of calf and all first order interactions were non-significant and were therefore excluded from the model to estimate least squares means. A separate analysis was carried out to determine if treatment had a differential effect within FS category at weaning on the change of FS from weaning to June 1988 and to April 1989. In that analysis, FS at weaning was fitted as a fixed effect using ten FS categories of 0.10 second intervals ranging from fast to slow. The model also included genotype, sex, treatment and the FS category x treatment interaction.

RESULTS AND DISCUSSION

Intensive training of calves at weaning had no significant effect on subsequent FS measurements (Table 1) nor on the change of FS from weaning to June 1988 or to April 1989. AX animals were significantly ($P<0.05$) slower than AXBX animals at weaning (1.16 vs 1.06 for AX and AXBX respectively) but at no other time. There were no differences in FS between bulls and heifers at any time.

Table 1. Least squares means for the effect of weaner handling treatment on flight speed (FS) in seconds at weaning, 6 weeks after weaning (June 1988) and 12 months after weaning (April 1989)

	Number of animals	FS at weaning	FS at June 1988	FS at April 1989
Mean ± s.d.		1.11 ± .31	1.22 ± .49	1.09 ± .50
Treatment		(n.s.)	(n.s.)	(n.s.)
TRAINED	98	1.10	1.24	1.12
CONTROL	96	1.12	1.20	1.06

The analysis that included FS category as a fixed effect indicated that while intensive training of calves had no overall effect on subsequent FS measurements, FS category at weaning did affect the change of FS from weaning to April 1989 ($P<0.01$) and also tended ($P<0.10$) to affect the change of FS from weaning to June 1988 (Table 2). Animals that were fast at weaning slowed more than slower animals from weaning to June 1988 and to April 1989, whether they were TRAINED or CONTROL animals. There was no practical change in FS of slower animals at weaning over either period. Intensive training of weaners is high in costs such as feed and labour, and on the basis of these results cannot be justified for all animals. However it appears that FS of fast animals may improve with increased handling either through use of an intensive training period or by handling during routine management procedures.

Table 2. The effect of weaner handling treatment within flight speed (FS) category at weaning on change of FS from weaning to 6 weeks after weaning (June 1988) and to 12 months after weaning (April 1989)

FS category at weaning	Number of animals	Change of FS from weaning to June 1988	Change of FS from weaning to April 1989
Mean ± s.d.		0.14 ± .43	0.08 ± .47
FS (seconds)		(n.s.)	($P<0.01$)
< 0.7	6	0.42	0.37
> 0.7 to ≤ 0.8	28	0.25	0.28
> 0.8 to ≤ 0.9	40	0.23	0.14
> 0.9 to ≤ 1.0	30	0.09	0.11
> 1.0 to ≤ 1.1	24	0.13	0.17
> 1.1 to ≤ 1.2	18	0.19	0.20
> 1.2 to ≤ 1.3	10	-0.10	0.02
> 1.3 to ≤ 1.4	9	0.09	-0.12
> 1.4 to ≤ 1.5	10	0.09	-0.13
> 1.5	19	0.00	-0.24

These results are similar to those of Murphey et al. (1980) who compared *Bos taurus* (dairy and beef breeds) and *Bos indicus* (Guzerat) raised as both beef and dairy animals. They concluded the method of raising animals had no effect on approachability of an observer to the animals, but handling of animals could not be excluded as a method of modifying approachability. Boissy and Bouissou (1988) concluded that extended prepubertal handling (from 0-9 months of age) was more effective in improving man-animal relationships than intensive short-term handling (from either 0-3 or 6-9 months of age). They found there were no differences between control animals and animals handled over the shorter periods. The results from this study and those cited above indicate it may be possible to modify temperament by training. To maintain long-term improvements however, it appears that intensive, long-term (>3 months) training is necessary. Such handling is not practical in extensive areas of northern Australia. The problem of poor temperament of cattle in northern Australia is also compounded by the necessity to use zebu crossbred cattle (Turner 1975) that have poorer temperaments than *Bos taurus* (Hearnshaw and Morris 1984).

In those areas, it is therefore suggested that temperament of zebu crossbred cattle is best improved by inclusion of temperament as a trait in selection programs. As well, animals that have fast Flight Speeds should be identified early in life and targeted either for slaughter or for additional handling. If calves were to be held in yards for other purposes (e.g. early weaning) intensive training could be used but in other cases, less expensive forms of training (e.g. animals grazed at pasture but mustered and handled as frequently as possible) would provide a more economical but equally effective adjunct to selection.

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