

# Beef Cattle Investigations in the Southern States of Australia

By B. A. PANARETTO\*

FACTUAL data of the liveweight curves of steers of the beef breeds and their dairy crosses have been collected in the Southern Australian States since

## SUMMARY

1949.

Repeatable liveweight change patterns have been identified. The duration and magnitude of gains and losses have been measured.

The carcass appraisal data have emphasised that liveweight increase per se is not the sole criterion of merit in production.

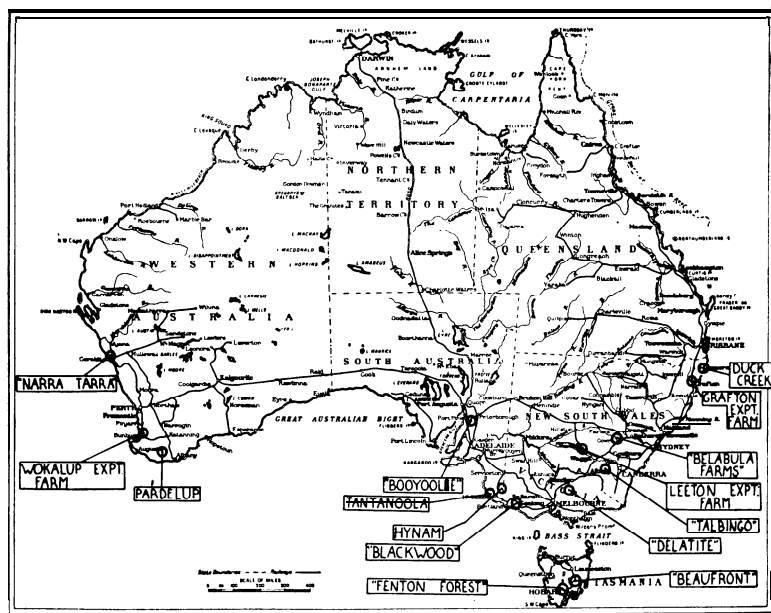
Progeny tests to date between tested sire groups have revealed no genetic superiority in ability to gain weight under the grazing conditions of these experiments.

## INTRODUCTION

The data discussed in this paper are based on experiments commenced in 1949 at fifteen cattle weighing centres in the Southern States of Australia?.

†This project has been sponsored by the Australian Committee on Animal Production, and financed by the Australian Meat Board and the Commonwealth Bank. Officers of the State Departments of Agriculture and the Division of Animal Health and Production, C.S.I.R.O., have co-operated in the work.

The locations of the centres are shown in Figure 1. They were selected to provide data which would be typical of extensive areas devoted to beef cattle production and, in a few instances, to provide specific information on a particular phase of the industry.



**FIGURE 1:** Location of beef cattle weighing centres in the southern States of Australia.

\*McMaster Laboratory, Division of Animal Health and Production, C.S.I.R.O., Sydney, N.S.W.

A description of these centres and some of the data have already been published (Hewitt, 1950, 1953; Muirhead and Allden, 1952 a, 1952 b; Bignell and Meldrum, 1952; Pillinger and Kelly, 1954; Franklin, 1955).

The object of this paper is to summarise very briefly the growth patterns from all centres and to discuss some aspects of carcass appraisal data and progeny testing.

## RESULTS

### Growth Curves

Three distinct growth patterns have been recorded:

- Rapid gains without any significant check at Belabula Farms, N.S.W., Tantanoola and Booyoolie, S.A., and at Fenton Forest and Beaufront, Tasmania.
- Biphasic gains comprised of periods of rapid and slow gains or moderate checks at Blackwood, Vic., and Narra Tarra, W.A.
- Biphasic gains comprised of periods of rapid and slow gains succeeded by prolonged periods of static or falling bodyweight at Grafton, N.S.W.; Delatite, Vic.; Hynam, S.A.; Wokalup and Pardelup, W.A.

Typical examples of these data are included in Table 1. They have been selected to illustrate the three types of growth pattern, but it must be emphasised that the figures give no indication of the time relationship of gains and losses. In the discussion of this paper, growth curves from Delatite in North Eastern Victoria are included in Figure 2, to illustrate the changing seasonal patterns of these gains and losses. Full details for other centres have been summarised elsewhere (Franklin, 1955).

TABLE 1

### MEAN LIVEWEIGHT CHANGES AT BEEF CATTLE INVESTIGATION CENTRES IN SOUTHERN STATES OF AUSTRALIA

Centre	Breed	Mean daily liveweight change		
		Gross gain <sup>1</sup>	Total loss <sup>2</sup>	Net gain <sup>3</sup>
		lb.	lb.	lb.
(a) Rapid gains without any serious check.				
Balabula Farms, N.S.W.	Aberdeen Angus	1.75 (181) <sup>4</sup>	Nil	1.75 (181)
Tantanoola, S.A.	Hereford	1.61 (281)	0.25 (28)	1.44 (309)
Fenton Forest, Tas.	Devon x Shorthorn	1.63 (330)	Nil	1.63 (330)
Beaufront, Tas.	Shorthorn	1.53 (336)	0.24 (28)	1.40 (364)
(b) Biphasic gains including periods of rapid and slow gains and moderate checks.				
Blackwood, Vic.	(i) Aberdeen Angus	1.68 (238)	0.87 (31)	1.38 (269)
	(ii) Aberdeen Angus	1.20 (313)	0.21 (53)	0.99 (367)
Narra Tarra, W.A.	(i) Aberdeen Angus	1.28 (635)	0.71 (85)	1.04 (720)
	(ii) Aberdeen Angus	1.58 (535)	0.37 (165)	1.12 (700)
(c) Biphasic gains including periods of rapid and slow gains succeeded by prolonged periods of static or falling bodyweight.				
Grafton, N.S.W.	Aberdeen Angus	1.09 (641)	0.44 (134)	0.82 (775)
Delatite, Vic.	(i) Hereford	1.61 (421)	0.59 (159)	1.00 (580)
	(ii) Hereford	1.44 (474)	0.47 (140)	1.08 (612)
Hynam, S.A.	(i) Poll Hereford	1.62 (427)	0.87 (195)	0.84 (622)
	(ii) Poll Hereford	1.71 (196)	0.82 (84)	1.00 (280)
Wokalup, W.A.	(i) AIS	2.29 (293)	0.82 (130)	1.24 (443)
	(ii) Aberdeen Angus	1.60 (570)	0.79 (178)	1.03 (748)
	(iii) AIS	1.87 (280)	0.85 (163)	0.87 (443)
Pardelup, W.A.	Hereford x AIS	2.23 (307)	0.70 (196)	1.09 (503)

<sup>1</sup>Gross gain represents mean daily liveweight increase during the periods when the animals were gaining weight.

<sup>2</sup>'Loss' represents mean daily loss during the periods when the animals were losing weight.

<sup>3</sup>'Net gain' represents mean daily liveweight gain over the whole of the experimental period.

<sup>4</sup>The figures in brackets represent the number of days.

## Carcass Appraisal

Groups of cattle from Beaufront and Fenton Forest in Tasmania, Delatite and Blackwood in Victoria, and Tantanoola in South Australia, have been appraised at slaughter by the Kneebone, Marks, McMeekan and Walker (1950) system.

The results of these tests have shown that carcass quality has been variable not only between centres, but between groups at a single centre and even within single groups.

## Progeny Tests and Production Testing

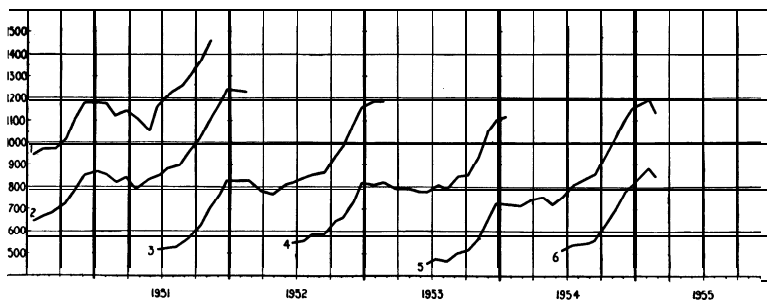
The Blackwood centre in Victoria, and Tantanoola and Hynam centres in South Australia, have run progeny tests under grazing conditions. To date, no significant differences in weights between progeny groups have been recorded at any of these centres.

In addition, production testing of both males and females has been carried out at Blackwood. The details of this work are not included here, but it is of interest to mention that the results have been similar to those reported by MacDonald (1956) from New Zealand.

## DISCUSSION

At centres where the plane of nutrition has been kept high throughout the year (pattern (a) Table 1), net gains almost equal gross gains. The problem of satisfactory beef production at these centres is mainly that of early maturity under conditions of rapid growth in which growth of bone, muscle and fat are more nearly simultaneous than where there are extended periods of static or falling bodyweights (patterns (b) and (c) Table 1). In these cases, the problem is more complex and it necessitates collection of data on the duration and magnitude of the periods of static or falling bodyweights and their effect on carcass quality.

As an example, the growth curves of cattle at the North Eastern Victorian centre are shown in Figure 2.



**FIGURE 2:** Seasonal changes in liveweight of Hereford steers at "Delatite," Mansfield, Victoria.

From the growth curves of group 3, for example, it will be seen that these steers grew to 800 lb. liveweight in December, 1951. In the 192 days, 22.vi.51-31.xii.51, they gained 306 lb. head liveweight. For the 113 days, 31.xii.51 until 23.iv.52, they lost 45 lb. per head. Finally, the cattle were finished and sold in February of 1953, at approximately 1,200 lb. liveweight. At slaughter, 22 of these cattle were appraised, using the Kneebone, Marks, McMeekan and Walker (1950) system and, of these, 15 were underfat and 3 overfat (Hewitt, 1953). It should be noted that these cattle which were over 800 lb. in December, 1951, did not grow to 1,082 lb. liveweight until December, 1952. In effect, from 31.xii.1951 until 4.xii.1952, these cattle gained 259 lb. in 339 days, so that the growth curve for these cattle was:

phase 1: 306 lb. per head gained in 192 days;

phase 2: 45 lb. per head lost in 113 days.

This was followed by another phase 1:

phase 1: 259 lb. per head gained in 225 days.

And this would have been followed by another phase 2 period had the cattle been carried on.

In this case, it is not the **magnitude** of the phase 2 which is grossly wasteful, but its **duration**. **In many cases, however, both the magnitude and duration** of phase 2 are very high; see Table 1, Wokalup and Pardelup, W.A.; Hynam, S.A.; and Delatite, Vic.

One of the most interesting points arising from the carcass appraisal data at Beaufront, Tas., has been the very low score for eye muscle development. However, at this stage of the work, it is not possible to draw many conclusions from the carcass appraisal studies at the various centres. The wide variation in carcass characters within groups as well as between groups has emphasised the complexity of the problem and that rapid liveweight increases **per se** are not sufficient criterion when measuring production in the beef animal.

The observations with the progeny test data would appear to support the experimental findings of Knapp and Baker (1943) who showed that the inherited differences in the ability of a sire's progeny to gain weight on **ad lib.** feeding were not evident when the feed intakes were restricted. The variable growth rates at the Southern States centres and the periods of liveweight loss appear to be masking evidence of genetic superiority for weight gains between sire groups. Another explanation, of course, could be that the sires being tested are of equal merit. In this regard, it must be mentioned that no observations were made on the sires themselves.

At the Blackwood centre, stud males and females from the 1953 calving have been weighed regularly, and it is hoped that data on progeny groups from these sires will be collected in order to provide further information on the performance of different sires under grazing conditions.

#### REFERENCES:

- Bignell, T. T., and Meldrum, G. K. (1952). Tasm. J. Agric. 23: 326.  
Franklin, M. C. (1955). Beef Cattle Investigations in the Southern States of Australia. Roneoed report prepared for 19th meeting of the Australian Committee on Animal Production, May 27, 1955.  
Hewitt, A. C. T. (1950). J. Dep. Agric. Vict. 48: 404.  
Hewitt, A. C. T. (1953). J. Dep. Agric. Vict. 51: 289.  
Knapp, Bradford, Jr., and Baker, A. L. (1943). J. Anim. Sci. 2: 321.  
Kneebone, H., Marks, T., McMeekan, C. P., and Walker, D. (1950). N.Z. J. Sci. Tech. A. 31: 4.  
MacDonald, M. A. (1956). Proc. Aust. Soc. Anim. Prod. 1.  
Muirhead, D. B., and Allden, W. G. (1952 a). J. Dep. Agric. S. Aust. 55: 348.  
Muirhead, D. B., and Allden, W. G. (1952 b). J. Dep. Agric. S. Aust. 56: 211.  
Pillinger, D. B., and Kelly, J. T. (1954). Tasm. J. Agric. 25: 5.