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## BRIEF COMMUNICATION

### The cost of producing feedlot beef in New Zealand

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#### ABSTRACT

In recent years there has been considerable interest in feedlotting as a means of producing beef carcasses with more desirable characteristics (e.g. improved fat colour, marbling). This paper outlines the cost of feeding heavyweight cattle on a feedlot ration and the likely premiums required to meet this additional cost.

In three experiments Angus steers were fed 70% grain diets *ad libitum* for at least 14 weeks. In experiments 1, 2 and 3, respectively, steers grew from 621 to 761 kg, 574 to 674 kg and 563 to 657 kg, over 70, 68 and 71 day periods, respectively. Feed intakes averaged 15.2 kg of dry matter per day and were 2.2% of bodyweight. Average liveweight gain was 1.60 kg/day and average feed conversion efficiency was 9.5 kg feed per 1 kg of liveweight gain. Based on typical New Zealand feed costs, the average daily feed cost was \$3.44 per head and the premium required to recoup the feed cost alone would need to be \$1.18 per kg of total carcass weight. Approximately \$1.48 per kg would be required to cover all costs.

**Keywords:** Beef; Japan; feedlot fed; cost.

#### INTRODUCTION

The need to diversify away from manufacturing beef and increasing interest in table beef for high value Asian markets, particularly Japan, has led to considerable interest in feedlotting cattle to improve beef quality. There is little appreciation in the farming community of the true cost of feeding cattle on a feedlot ration, particularly one comprising a high percentage of concentrate. Costs typical of feedlotting cattle in New Zealand are outlined in this paper.

#### MATERIALS AND METHODS

Data have been taken from three experiments in which Angus cattle were fed a feedlot ration comprising 70% grain and 30% pasture silage *ad libitum* for periods of at least 12 weeks (plus an adjustment period of at least 2 weeks). Cattle were fed daily and a blended mineral mix (mineral and vitamin premix (NRM#5425), limestone and sodium bicarbonate ( $\text{Na}_2\text{CO}_3$ )) in the ratio of 1:10:15 was mixed daily with feed at a rate of 2g/kg DM. Feed intakes were measured weekly and liveweight gains recorded fortnightly. Data used in this paper was taken from a period when cattle were fully adjusted to the ration and were in or approaching the carcass weight range appropriate for the Japanese market (i.e. in the range 300 to 400 kg).

**Experiment 1:** Ten rising three-year-old Angus steers were fed for 98 days (including a 14 day adjustment period) on a ration of 70% maize grain and 30% pasture silage (Muir *et al.*, 1992). The data set used from this experiment was between days 28 and 98.

**Experiment 2:** Ten rising three-year-old Angus steers were feedlot fed for 84 days (including a 14 day adjustment

period) on a ration of 70% barley grain and 30% pasture silage (Muir, *unpublished data*). The data set used from this experiment was between days 16 and 84.

**Experiment 3:** Fourteen rising two-year-old Angus steers were fed a ration of 70% maize grain and 30% pasture silage in a long running feedlot experiment (Muir, *unpublished data*). A 71 day data set was used and steers had been previously been feedlot fed for 10 months.

#### RESULTS

Steers grew from 621 to 761 kg, 574 to 674 kg, and 563 kg to 657 kg in Experiments 1, 2 and 3, respectively. Over the 70 day period, feed intakes averaged 15.2 kg of dry matter and were 2.2% of bodyweight. Average liveweight gains were 1.60 kg/day and average feed conversion efficiency was 9.5 kg feed to 1 kg of liveweight gain (Table 1). This level of feed conversion efficiency is within the range (8.9:1, 10.1:1, 12.4:1) reported by other authors (Brennan *et al.*, 1987; Oltjen *et al.*, 1971; Young and Kauffman, 1978; respectively) for steers fed *ad libitum* on high grain rations.

**TABLE 1:** Liveweight gains, feed intakes and feed conversion efficiencies (FCE) of cattle fed a 70% grain feedlot ration *ad libitum* for approximately 70 days.

	No days	LWG (kg/d)	DM Intake (kg/d)	(%BW)	FCE
Expt 1	70	2.00	18.01	2.61	9.01
Expt 2	68	1.47	16.81	2.22	11.43
Expt 3	71	1.32	10.62	1.76	8.02
Mean		1.6	15.2	2.2	9.5

## DISCUSSION

Based on typical New Zealand feed costs of 28.2 c/kg DM for barley (\$240/tonne) and 10 c/kg DM for pasture silage, it would cost \$3.44/day to fed these hypothetical cattle on a 70% grain ration under *ad libitum* conditions. These results can be extrapolated to a 120 day feeding period (i.e. a minimum short feeding period for the Japanese market) since changes in feed conversion efficiency and liveweight gain are likely to be small over such a short time frame (Muir, *unpublished data*). The total feed cost would amount to \$413 for a 120 day period. With the average carcass weight gain of 0.85 kg/day achieved in these experiments (1.6 kg liveweight gain x 0.53% dressing out %) total carcass weight would increase by 101 kg over a typical 120 day feeding period and each 1 kg increase in carcass weight would be expected to cost \$4.09 in feed. Assuming a carcass weight at slaughter of 350 kg, the premium needed to recoup the feed cost would be \$1.18 for each kg of the whole carcass. This cost is intended only as a guide. Clearly, feed costs will vary with level of feeding and the growth rates achieved. In addition feed mixes and costs will vary as different regions will have cheaper/alternative feed sources e.g. maize instead of barley, maize silage or hay as a roughage source and brewers grains as an alternative protein source.

Other costs likely to be incurred are mineral and vitamin additives, bedding, labour and machinery for feeding and pen cleaning. In addition there is an initial capital requirement for construction of the initial feedlot structure and its feed troughs and water supply together with ancillary facilities for feed storage and removal/storage of liquid and solid effluent which may be produced. All of these costs are difficult to quantify as they will be heavily influenced by the size of the facility and hence economies of scale. Moreover the location of a feedlot facility will affect the establishment costs as costs of complying with the Resource Management Act will vary with soil type, drainage and distance from a population centre.

As an small scale example, the research feedlot at the Poukawa Research Station holds 100 cattle and would cost

approximately \$90,000 to build and purchase a minimal amount of ancillary machinery. With a throughput of 300 head per year (100 cattle @ 120 days), the per head interest cost of the facility would be approximately \$300 @ 12% (i.e. \$36 or 10.2 cents/kg carcass weight). In addition, mineral and vitamins, animal health, labour for feeding and cleaning together with purchase of sawdust for bedding would cost approximately \$70/head or 20 c/kg carcass weight. The total cost of fully utilising the research facility on a year round basis to feed heavyweight steers would therefore be approximately \$519 per head or \$1.48/kg of total carcass weight. Of this total cost, 80% would be attributable to the cost of feed.

The analysis by Chadee and Mori (1993) would suggest that premiums of this level are unlikely to be captured from the Japanese market if the carcasses are sold through the wholesale auction process since imported carcasses are heavily discounted in the Japanese wholesale market even if of similar grade to Japanese beef. On the other hand, beef sold through an importer/distributor may enable some of the trading margin between Japanese wholesale and retail beef to be captured which would then make the feedlotting exercise economic.

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