THE ECONOMICS OF PINK VEAL PRODUCTION IN AUSTRALIA

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SUMMARY

Data from 437 dairy bull calves fed 1 of 35 diets in 10 different experiments were used to compare 4 different feeding systems for producing 70 kg pink veal carcasses. These systems were: feeding high quantities (HM, 10 L/day or more) or low quantities (LM, less than 10 L/day) of milk through till slaughter, or early weaning calves by 8 weeks of age then keeping them indoors (EW) or at pasture (EW/P) until slaughter. In all cases, *ad libitum* concentrates were fed.

Age at slaughter to produce 70 kg pink veal carcasses increased from 95 (HM) to 111 (LM) to 128 (EW) through to 143 (EW/P) days for the 4 feeding systems. Average total feed costs ranged from a high of $266 (HM) to a low of $95 (EW). For a veal producer using a shed holding 85 calves to rear up to 250 calves per year, the break-even return would have to be as high as $5-$6/kg carcass weight with HM-fed calves at high feed prices and should not fall below $4/kg carcass weight when producing EW calves at low feed prices.

Keywords: pink veal, dairy beef, calf growth rates, total feed costs

INTRODUCTION

New-born calves require whole milk and high-energy concentrates in their diet to provide the nutrients for growth. These are high cost feedstuffs (5 to 10 c/MJ of metabolisable energy or ME compared to 0.5 to 1 c/MJ for grazed pasture, Moran 1993). If slaughtered prior to 6 months of age as veal, their carcasses must then command a high price to be profitable. Traditional, and cheaper, sources of veal in Australia have been from week-old "bobby" calves excess to dairy herd requirements and light weight beef breed calves. However, as their meat quality is poorer than from calves specifically grown out for veal, many chefs in Melbourne's hospitality trade dislike "bobby" veal because it shrinks during cooking, resulting in tough and rubbery meat (Warner *et al.* 1990). To produce white veal, calves must be fed minimal levels of iron, through a diet entirely of milk solids, and housed in individual wooden crates, practices which would severely limit acceptance by Australian and European consumers (Moran *et al.* 1991).

Sourcing quality veal poses particular problems for gourmet chefs because they consider milk-fed, white veal too expensive relative to other meats, yet diners do not recognise it as a luxury product. Production costs for grain-fed pink veal are lower than for milk-fed veal; thus it provides a cheaper alternative (Moran *et al.* 1991), and has equivalent eating quality (Johnson *et* al. 1992). Despite this, price discriminations exist against pink veal. For example in 1989, Melbourne meat processors paid producers $6-$7/kg carcass for white veal, $4-$5/kg carcass for grain-fed, pink veal compared to only $2-$3/kg carcass for "bobby" veal (Moran *et al.* 199 1); 1996 Melbourne veal prices are similar to those for 1989.

A 3 year study examined various aspects of pink veal production (Warner *et* al. 1990) in which calves were fed a wide variety of diets and slaughtered over a range of liveweights. This paper summarises these data in terms of animal performance, feed inputs and total feed costs to produce 70 kg carcasses. The end point of this economic appraisal is the break-even carcass return, or the $/kg carcass required to cover full production costs. Relating this to actual prices paid for pink veal can provide a guide to the profit margins that producers might expect.

MATERIALS AND METHODS

Data were used from 10 research experiments conducted between 1985 and 1987 at 2 Agriculture Victoria research stations, 6 at Kyabram and 4 at Ellinbank. Experiments were undertaken using calves sourced either during spring or autumn from local calf sales. Full details of the research methodology, including the diets fed, have been presented by Warner *et al.* (1990). The data presented below originated from a total of 437 dairy bull calves fed on 35 different diets. All calves were fed whole milk or milk powder during early rearing together with *ad Zibitum* concentrates. Concentrate formulations were based on cereal grain and byproducts, formulated to provide at least 11 MJ ME/kg DM and 18% crude protein (Warner *et al.* 1990). For the purposes of the analyses, the wide range of diets were categorised into 4 feeding systems, based on the quantity of whole milk (or milk powder) fed after 8 weeks of age and whether weaned calves were kept indoors in rearing sheds or maintained outdoors at pasture. The feeding systems were as follows:

1. High milk (HM); calves were fed *ad Zibitum* concentrate and 10 L/day or more of whole milk (or its equivalent in milk powder) after 8 weeks of age.
2. Low milk (LM); calves were fed *ad Zibitum* concentrate and less than 10 L/day of whole milk (or its equivalent in milk powder) after 8 weeks of age.
3. Early weaned (EW); calves were fed *ad libitum* concentrate, but not whole milk or milk powder, after 8 weeks of age and were kept indoors until slaughter.
4. Early weaned at pasture (EW/P); calves were fed limited quantities of concentrates, but not whole milk or milk powder, after 8 weeks of age and were grazed outdoors until slaughter.

All calves were slaughtered during the studies, with serial slaughter undertaken in 6 of the 10 experiments. Within each diet group, regressions of individual hot carcass weight (HCW) and slaughter age were used to calculate average ages at slaughter to produce 70 kg HCW. From group feed intake data, the total amount eaten by that age was calculated. This included whole milk, milk powder, concentrates and roughage. Milk powder inputs have been converted to whole milk, assuming 13% milk solids.

The following data were collected on calves fed each of the 35 diets: liveweight at 12 weeks of age (LWT), slaughter age at 70 kg HCW (AGE), growth rates and DM intakes from 8- 12 and from 12-16 weeks of age, total feed costs to produce 70 kg HCW at a low feed price and a high feed price scenario. For calculation of total feed costs, the assumed unit feed costs in 1994/95 for the low vs high feed price scenarios were respectively: whole milk (20 vs.30 c/L), milk powder ($44 vs.$52 per 20 kg bag), concentrates ($250 vs $300/t), roughage ($100 vs $150/t). The extremes of total feed costs were $361/calf for HM at high feed costs and $83/calf for EW at low feed costs.

Data from the 35 diets were weighted for the number of calves used to calculate each mean value. These data were subjected to linear models which predicted Y values from 2 factors, namely SE (season of rearing, spring or autumn) and DI (diet, HM, LM, EW, and EW/P). The Y values calculated were those performance measures and total feed costs mentioned above. Diet effects were compared from predicted Y values using the respective standard errors calculated in each model.

The total production costs for supplying meat processors with 70 kg pink veal carcasses, grown using either the HM, LM or EW feeding systems, were calculated using the following assumptions, described in more detail by Warner *et al.* (1990). These were based on pink veal being only a small part of the total farm operation, having a throughput of up to 250 calves per year in a shed that can hold 85 calves, used for growing them out for only 40 weeks each year. Calves were purchased at $70 each and suffered a 3% mortality, while a further 3% culls resold for their purchase price. Additional annual overhead costs were $7740 which include labour at $10/hr ($5040), power, repairs and maintenance ($1200) and depreciation ($1500). Variable costs of animal health, transport and slaughter were assumed to be $32.50 per calf slaughtered.

RESULTS AND DISCUSSION

Mean inputs of diet constituents are presented in Table 1. Calves fed HM consumed more whole milk and less concentrate ($P<0.05$) to produce 70 kg HCW, followed by those fed LM, EW/P then EW. Roughage intakes and hence total feed consumed were not monitored for EW/P-fed calves. For the other 3 systems, total feed costs to produce 70 kg HCW varied from $95 to $180 at the low price and from $132 to $266 at the high feed price scenarios.

The HM-fed calves had the highest 12 week LWT and the lowest slaughter AGE ($P<0.05$), while LM-fed calves had higher 12 week LWT. and lower slaughter AGE than both EW and EW/P-fed calves. From 8-12 weeks, HM-fed calves grew the fastest ($P<0.05$) and the EW-fed calves grew the slowest ($P<0.05$). There were no significant effects of season of rearing on feed intakes or calf performance.

Between 8 and 12 weeks of age, feed conversion ratios in kg DM/kg liveweight gain for the HM- and LM-fed calves were 1.63 and 2.15 respectively, both lower ($P<0.05$) than the 2.85 calculated for the

EW-fed calves. Corresponding values between 12 and 16 weeks of age were 2.00 and 2.42 for the HM- and LM-fed calves, both lower ($P<0.05$) than the 2.94 calculated for the EW-fed calves.

Compared to HM-fed calves, higher concentrate intakes would reduce dressing percentage of LM-, EW- and EWIP-fed calves, thus increasing their slaughter live weights and ages to produce 70 kg carcasses. Any liveweight gain advantage of EW/P over EW-fed calves beyond 12 weeks of age was lost during paddock grazing. Unlike the 3 housed groups, the grazing calves did not grow any faster after 12 weeks of age, which suggests nutrient intakes were limited by restrictions of feed quality and/or pasture availability. Grazed pasture also causes the meat to become less pale (Warner *et al.* 1990), thus reducing its acceptability to consumers. Therefore, pink veal calves cannot be given access to pasture, and hence will have to be continuously housed.

Table 1. Diet means (and their standard errors) of total inputs of constituents and feed costs to produce 70 kg **HCW and for measures of calf performance. See text for details of diets**

	HM	LM	EW	EW/P
Total input of diet constituents				
Whole milk (L)	860*a*	774*b*	193*d*	353*c*
	(33)	(52)	(46)	(52)
Concentrate (kg)	29.9*d*	76.0*c*	222.1*a*	139.7*b*
	(13.3)	(21.3)	(18.9)	(21.2)
Roughage (kg)	0.6*b*	2.7*b*	24.0*a*	nd
	(1.3)	(2.1)	(1.8)	
Total feed cost ($)				
Low price	180*a*	178*a*	95*b*	nd
High price	266*a*	248*a*	132*b*	nd
alf performance				
Liveweight at 12 weeks (kg)	114.9*a*	105.3*b*	91.3*d*	100.0*c*
	(2.3)	(3.3)	(3.3)	(3.7)
Age at 70 kg HCW (days)	96.2*c*	109.4*b*	134.7*a*	142.5*a*
	(3.4)	(4.8)	(4.8)	(5.5)
Liveweight gain 8-12 wk (kg/day)	1.15*a*	0.84*b*	0.74*c*	0.81*b*
	(0.05)	(0.07)	(0.07)	(0.08)
Liveweight gain 12-16 wk (kg/day)	1.22*a*	1.05*b*	1.01*b*	0.81*c*
	(0.06)	(0.07)	(0.07)	(0.08)

Within rows, values followed by a common letter do not differ ($P<0.05$). nd; not determined.

Table 2 presents an economic appraisal of 3 different feeding systems in a simulated veal production unit, using the assumptions described in the previous section. With low priced feeds, producers require at least $4.58/kg for milk-fed or $3.48/kg carcass weight for early weaned, grain-fed pink veal to cover full production costs. With high priced feeds, producers require a break-even carcass return of at least $5.58/kg when feeding milk through to slaughter and $4.01/kg carcass weight for early weaned calves. Other factors influencing the viability of pink veal producers include the long term risk of the fixed capital invested in sheds and equipment, and the short term risk of time and operating capital invested in each batch of calves, particularly in the face of highly variable veal prices. The issue of return on investment to cover return on capital, risk and profit also needs to be considered.

Early weaning, grain feeding systems appear to be profitable, provided pink veal carcasses return $4 to $5/kg carcass weight. However, long term profitability will be further reduced after including the hidden costs mentioned above. Until meat processors are prepared to pay at least $5.50/kg carcass weight for pink veal, profits from feeding milk beyond 8 weeks of age are very marginal.

Table 2. Total production costs and break-even carcass returns for an operator producing 70 kg carcasses of pink veal using one of 3 production systems. See text for details of costings and other assumptions

	HM	LM	EW
Slaughter age (wks)	13.7	15.6	19.2
Calves purchased each year	250	214	186
Carcasses sold each year	235	201	175
Annual calf costs (less culls) ($ 000)	6.97	14.53	12.63
Annual operating costs ($ 000)	5.38	14.27	13.43
Annual feed costs ($ 000)			
Low feed prices	4230	35.78	16.62
High feed prices	62.51	49.85	23.10
Annual total production costs ($ 000)			
Low feed prices	74.65	64.58	42.68
High feed prices	94.86	78.65	49.16
Break-even carcass returns ($/kg)			
Low feed prices	4.54	4.58	3.48
High feed prices	5.77	5.58	4.01

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REFERENCES

JOHNSON, D., VAN HORN, H., WEST, R. and HARRIS, B. (1992). *J. Dairy Sci. 75: 2799-804.*

MORAN, J.B. (1993). *In* "Calf Rearing - A Guide to Rearing Calves in Australia", p. 220 (AgMedia: Melbourne).

MORAN, J., HOPKINS, A. and WARNER, R. (1991). *Outlook on Agriculture 20:* 183-90.

WARNER, R., MORAN, J., TRUSCOTT, T., STEVENS, S., CURRIE, J., TAYLOR, J. and HOPKINS, A. (1990). Res. Rep. 104, Vic. Dep. Agric.