

CONTRACT REVIEW

CHANGING BEEF MARKETS - SHOULD NORTH QUEENSLAND PRODUCERS CHANGE MANAGEMENT TO MEET THEM?

M.T. SULLIVAN

Queensland Dept of Primary Industries, Mount Isa, Qld 4825.

INTRODUCTION

For the purposes of this paper, north Queensland is considered to be the area north of a line from Mackay to Mount Isa. Apart from the wet tropics and the Atherton Tablelands the region has a highly seasonal, dry tropical climate. Cattle production is limited by the relatively short periods of good cattle growth and long periods of weight maintenance and loss.

Traditionally the region has produced bullocks aged 3-5 years and cull cows for the American manufacturing meat market or store cattle for finishing elsewhere. A small proportion of slaughter cattle are suitable for the Japanese and Korean markets. The cattle industry has seen major changes in management and markets in recent times. Poor seasonal and economic conditions in the 1980s and in some cases the Brucellosis and Tuberculosis Eradication Campaign (BTEC) campaign encouraged and/or forced many bullock producers into store production and store producers into younger turnoff.

Access to premium markets by northern beef producers is likely to be further restricted in the future by tighter specifications on age, weight and finish. Store producers will also face increasingly specific markets, as finishers seek cattle able to produce suitable carcasses under their production systems at a profit. Producers who have adopted younger turnoff have often found store markets more prone to seasonal and general market fluctuations.

This contract discusses factors northern producers should consider in response to possible changes in beef markets.

IMPACT OF YOUNGER TURNOFF ON THE PROFITABILITY AND STRUCTURE OF CATTLEHERDS

M. T. SULLIVAN^A, T. H. RUDDER^B and W.E. HOLMES^C^AQueensland Dept of Primary Industries, Mount Isa Qld 4825.^BQueensland Dept of Primary Industries, Brisbane Qld. 4001.^CQueensland Dept of Primary Industries, Townsville Qld 4810.

Northern graziers have traditionally turned off bullocks at 3.5-5 years or store steers at 1.5-3 years. Because of the likely future requirements of some markets for younger beef it is important to assess the impact of different ages of turnoff on profitability and herd structure.

Profitability

To evaluate the impact of turnoff age on profitability the **Breedcow/Dynama** Herd Budgeting Package (Holmes 1990) was used to model the following male turnoff options: (i) bullocks (3.5-4.5 years), (ii) steers (2.5-3 years), (iii) yearling steers (15-20 months), (iv) weaner steers (8-15 months).

Each turnoff option was applied to model herds with production and input parameters representative of north Queensland properties. For each turnoff option, male cattle prices which would produce the same gross margin as bullock turnoff were calculated (Table 1). Table 1 shows that, for yearling and weaner turnoff, considerably higher prices per kg liveweight are required to produce the same gross margin as bullock production. The magnitude of the weaner prices required is such that a major shift in price relationships would have to occur for weaner turnoff to be profitable for most producers. Exceptions would be properties on good country with suitable cattle which can achieve high weaning rates and produce high value vealers or weaners.

A northern beef property is really 2 enterprises, a breeding enterprise producing weaners and a growing enterprise turning these weaners into bullocks or older stores. Optimum age of turnoff is determined by the relative profitability of breeding stores versus growing these animals into older stores or slaughter bullocks. If the profit from breeding is restricted by low branding rates, retention of stores is favoured.

Table 1. Breakeven prices (\$/kg liveweight) for younger male turnoff to produce gross margins equal to those for bullock turnoff

Turnoff age	Liveweight (kg)	Branding 60% Low input	Branding 70% Improved management	Branding 80% Improved management	Branding 80% Low input
Bullocks (3.5–4.5 years)	565	1.00	1.00	1.00	1.00
Steers (2.5–3 years)	400	1.06	1.05	1.02	0.99
Yearling steers (15–20 months)	280	1.27	1.25	1.19	1.13
Weaner steers (8–15 months)	210	1.60	1.58	1.48	1.39

As branding rates increase, the price premium for younger cattle to produce returns equal to bullock turnoff declines. Increased branding rates which result from improved management practices may enable producers to consider younger turnoff. One consequence of changing to a younger turnoff may be a rise in branding rates when breeders are grazed on better country which was previously used for bullocks.

The profitability of growing steers is affected by growth rates and by relative prices for stores and slaughter cattle. Demand for younger beef may lead to reduced returns for older cattle and/or increased prices for stores which can be finished by the required age. The expanding Asian market for yearling steers may also lead to higher prices for stores.

While bullock turnoff still appears to be the most profitable option for individual northern properties, the vertical integration of 'northern' breeding properties and 'southern' fattening properties is an established practice which more producers are adopting. The economics of such integrated operations have not been assessed; however some advantages would result. These include being able to breed the type of store cattle required, greater control over supply and some flexibility of age of transfer according to feed supplies on both properties. Younger animals are also cheaper to move and cattle can be on higher quality feed sooner, thus reaching target turnoff weights at younger ages.

Because properties vary in performance and individual producers have different financial positions, the optimum turnoff age is best determined by analysis of the individual enterprise. In some instances cash flow considerations may prevent the adoption of older turnoff even when it is more profitable. An important consideration in determining optimum age of turnoff is the capital cost of owning cattle. Producers should consider if the money tied up in older cattle could be invested more profitably by marketing cattle earlier.

Herd structure

If age of turnoff is reduced, major changes occur in herd structure, which necessitates management changes. Table 2 shows that the proportion of breeders and weaners will increase and that of growing cattle will decrease as age of turnoff is lowered.

Table 2. Composition (%) of bullock and weaner producing herds with 70% branding rates

	Breeders	Weaners	Others
Bullock turnoff	31	26	43
Weaner turnoff	44	36	20

Management of breeders and weaners is **labour** intensive and a property changing to younger turnoff has to be able to provide the extra **labour** requirements. Changes in infrastructure, such as larger weaner and heifer paddocks may also be required to manage the changes in herd structure.

Breeders and weaners have the highest nutritional requirements and consequently herds employing a younger turnoff will be more vulnerable to adverse seasonal conditions. With fewer dry growing stock there is less opportunity to reduce stock numbers without selling breeders in a drought. In general drought-affected breeders attract few buyers because of their condition and the problems created by small calves.

IMPROVING BREEDER HERD EFFICIENCY IN NORTH QUEENSLAND

G. FORDYCE^a and K. W. ENTWISTLE^b^aQueensland Dept of Primary Industries, Swan's Lagoon Research Station, Millaroo, Qld 4807.^bJames Cook University of North Queensland, Townsville, Qld 4810.

Breeder herd production in many areas of north Queensland remains relatively low despite major advances in technology in the past 3 decades. If producers are to adopt a younger turnover they have to achieve branding rates in the order of 80% for the profitability of the enterprise to be equal to bullock production. This paper presents some options for achieving improvements in breeder herd productivity.

Management strategies

Segregation allows more efficient implementation of other strategies. Primary segregation groups are early weaners (100-150 kg), weaners (> 150 kg), heifers, first calf cows, mature cows, cull cows, steers and bulls.

Gross margins are increased by approximately 20% by implementing recommended weaning practices in a typical North Queensland herd (Fordyce 1990). At each muster, calves are weaned down to a minimum age (generally 3 months or 100 kg) which is determined primarily by pasture quality changes and availability of facilities to manage weaners. Weaning must be carried out at least twice yearly (Sullivan *et al.* 1992). The second weaning is necessary to minimise the number of cows lactating during the dry season. Weaning improves body condition of cows, thereby increasing fertility and probability of dry season survival. In non-pregnant cows in backward store condition or better, weaning also triggers cycling (McSweeney *et al.* 1989). Growth of early-weaned calves given appropriate supplementation matches that of unweaned calves (Fordyce 1990) as dams have low milk yields on poor quality pastures.

At least 10% of cows will have low fertility but may not be readily identified. Systems to identify these sub-fertile cows in continuously mated herds have been described (Fordyce 1990). Many fat non-lactating cows which are culled have adequate fertility as evidenced by the 70% pregnant at slaughter (Ladds *et al.* 1975).

Bull purchases are a significant cost. Bull efficiency is increased by initial mating at 2 years of age when most have reached puberty (Wildeus *et al.* 1984) and culling after 6 years of age when fertility begins to decline (Entwistle 1984). Culling at this age also increases the rate of genetic improvement by reducing the generation interval. Culling of reproductively unsound bulls will also increase herd efficiency, though 10% of apparently normal *Bos indicus* bulls may be subfertile (Holroyd and Entwistle, unpublished data).

Self-mustering systems (Cheffins and Hirst 1990) reduce labour costs and stress. This technology allows additional musters at minimal cost which facilitates the adoption of other strategies, particularly dry season weaning and segregation of animals for preferential treatment.

Improving nutrition

Seasonal undernutrition is the primary reason for low growth, low fertility and high death rates in north Queensland herds. Primary nutrient deficiencies are of nitrogen, sulfur, phosphorus and energy. A policy of conservative, flexible stocking rates improves nutrition and reduces supplementation requirements. Improved pastures can increase significantly growth and calf output efficiency, while reducing management and supplementary feeding costs.

Phosphorus (P) supplementation is recommended for much of North Queensland (Winks 1990). In the wet season, P is the major limiting nutrient and supplementation has effects primarily by increasing dry matter intake (Winks 1990). Many producers claim major improvements in productivity through improved branding rates, breeder body condition and weight with P supplementation. Precise supplemental P requirements for breeding cows have not been well defined, nor have responses in breeding herds been adequately documented.

Supplementation with non protein nitrogen and sulphur commencing early in the dry season reduces weight loss (Winks 1984), thus reducing mortalities particularly in weaners and in late pregnant and lactating cows. True proteins are commonly included in supplements for weaners and other classes of animals with higher nutritional requirements. Supplementing for a short period at the end of the dry season to arrest weight loss requires higher levels of nitrogen, sulphur and energy; these can be provided by protein meals or fortified molasses.

Feeding a high-energy supplement for 50 days in the late dry season to mid- to late-pregnant cows (spike feeding) reduces the calving to cycling interval (Fordyce *et al.* 1989). Pregnancy rates prior to weaning are increased by 15% in first-calf cows (G. Fordyce and K.W. Entwistle, unpublished data). This strategy is a simulation of an early break in the season which is related to high quality pre-partum feed and subsequent above-average fertility (Anderson 1990). Post-par-turn feeding with high energy supplements is generally inefficient in increasing fertility as *Bos indicus* cows partition a major proportion of supplemental energy to milk production (McSweeney *et al.* 1988).

Independently of established weight-fertility relationships, pre-pubertal heifers which lose weight in the dry season after weaning may have reduced fertility at 2-year-olds (Doogan *et al.* 1991). Current research is defining phases of pre-pubertal reproductive development which are sensitive to nutritional and hormonal feedback.

Animal health

Vaccines are available against the major economically-important infectious diseases in northern Australia. For the most important, botulism, effective diagnostic tests, better understanding of the vaccine’s protection, and a full understanding of the disease’s epidemiology will improve management of vaccination programs.

Genetic contribution

In the dry tropics, breeder performance does not significantly differ between 1/2 and 3/4 Brahman crosses (Holroyd *et al.*1990), though cattle with lower and higher levels of *Bos indicus* may both have lower productivity. Saiwahl crosses do not offer production advantages over Brahman crosses (Holroyd *et al.* 1990). **Africander** crosses have only expressed higher productivity in more favourable environments (Entwistle and Goddard 1985). As fertility is both heritable (MacKinnon *et al.* 1987,1990) and repeatable (Fordyce *et al.* 1988) in tropical cattle in tropical environments, culling of subfertile cattle can improve herd reproductive efficiency.

TECHNOLOGIES TO ENHANCE THE ABILITY OF PRODUCERS TO MEET MARKET REQUIREMENTS

J. A. LINDSAY

Queensland Dept of Primary Industries, Swan’s Lagoon Research Station, Millaroo, Qld 4807.

Current price relativities for stores and bullocks mean that bullock production for the USA manufacturing meat market is likely to remain the most attractive option for many producers. However, there is the potential for technology to be used to improve returns from a wider range of markets.

Market requirements

Table 3 shows the carcass specifications for the principal export markets to which north Queensland producers can target their production.

Table 3. Beef market carcass specifications

	USA manufacturing	Japanese grassfed	Korean grassfed
Weight (kg)	> 220	280–420	180–280
P8 fat depth	3–22	12–22	6–12
Dentition	0–8	0–8	0–8

USA market. The USA market is for lean manufacturing beef and the broad specifications mean that most cull cows and bullocks produced in north Queensland are suitable. Heavier carcasses produce greater returns, with a premium being paid for carcasses above 300 kg.

Japanese market. This market requires carcasses of at least 280 kg and premiums are offered for those above 300 kg. A greater degree of finish is required and fat and meat colour specifications are applied. Northern cattle generally fail to meet market specifications because of a lack of weight and/or

finish. Likely future demand for animals with 6 teeth or less will further restrict access to this market unless growth rates are increased or minimum carcass weights reduced.

Korean market. Producers in many areas of north Queensland have the potential to supply this market. This is because the requirement is for lighter and leaner carcasses as well as the 6 tooth age restriction.

Meeting market specifications

Producers have the opportunity to use technology, to either produce a heavier animal at the same age for the USA market or to produce animals at an acceptable weight and age for the alternative markets of Korea and Japan.

More beef at same age. The northern producer can do this economically by using an hormonal growth promotant (HGP) alone or a HGP in combination with dry season supplementation. The HGP will increase final liveweight by 25 to 35 kg and the combination can increase turn-off weight by up to 80 kg (Table 4). This will not only increase returns per animal, but may enable a producer to target the Japanese market as more of his bullocks will be suitable for the market.

A typical dry season supplement is cottonseed meal or a molasses, urea mixture, the cost benefit ratio is usually 1:2.

Table 4. Effects of HGP implantation and supplementation on final liveweights (3.5 year old steers) (Lindsay *et al.* unpublished data)

HGP hormonal growth promotant; supplement, molasses plus 8% urea or cottonseed meal given in the first and last dry seasons

Treatment	Final liveweight (kg)
Control	530
HGP	560
Supplement	570

Younger beef at acceptable weights. Improved pastures have the potential to boost liveweight gains in some areas of north Queensland. *Stylosanthes* spp. pastures can be established where rainfall is more than 800 mm. The potential of these pastures is illustrated in a current study (Lindsay, Cox and Gelling, unpublished data) using steers which are now 2.5 years old. The steers on the native pastures weighed 475 kg and those on improved pasture (*Stylosanthes* spp. plus P supplements) weighed an extra 100 kg.

Table 5. Effects of age of transfer to finishing pasture on liveweight at 2.4 years of age (Lindsay, Venamore and Loxton, unpublished data)

Treatment	Liveweight (kg)
Northern native pasture	376
Weaner transfer ^A	483
Yearling transfer ^A	443
^A Transferred to buffel grass pastures.	

Transferring northern cattle to superior finishing country is a well established practice. However, because little is known about the performance of transferred cattle it is currently difficult to identify the most profitable transfer options. Recent results with yearling transfer show that steers reach carcass weights for the Japanese trade 9 months earlier if moved to buffel grass pastures. An even earlier turn-off is expected when the steers are moved at weaning. This is shown in Table 5. In determining the most profitable option, the age requirement of target markets, growth rates on the breeding property from weaning to yearling transfer age and freight costs will also have to be considered.

Feedlots are playing an increasing important role in the Australian beef industry because animals can be rapidly finished to consistently produce carcasses suitable for premium markets. There would appear to be limited potential for feedlotting in north Queensland due to a lack of grain. In addition the *Bos indicus* content of most northern cattle makes them unsuitable for current premium lot fed markets.

CATTLE AND PROPERTY MANAGEMENT FOR SUSTAINED PRODUCTIVITY AND PROFITABILITY

T. H. MANN^a and L. T. WICKSTEED^b

^aHillgrove Station, Charters Towers Qld 4820.

^bQueensland Dept of Primary Industries, Townsville, Qld 4810.

This paper provides an introduction to the management philosophy and practise of one grazier who has carefully considered management and marketing options and evolved a production system to suit his environment.

Hillgrove Station is managed as a business with a focus on profits; however this policy recognises the need to 'care' for the land resource. Management philosophy is characterised by flexibility, the need to change in response to variable climate and markets. Management in times of drought emphasises selling cattle early, rather than drought feeding large numbers. This policy is implemented if general rain has not been received by late February. The longer term objective is to be slightly understocked rather than overstocked and uses occasional fires to control regrowth. In the longer term also a policy of steady capital expenditure on improvements (fencing, lanes, traps and pasture improvement) is followed to permit continued gains in efficiency and productivity.

Lochwall and Hillgrove, 85 km north west of Charters Towers, comprise in total about 650 km² of country, 8000 ha of which is basalt 'fattening' land (1 beast to 4 ha), while 30% of the balance is narrow leaf ironbark river frontage country and the remainder is phosphorus deficient yellowjack-titree country (1 animal to 16 ha). The station usually runs around 8000 cattle including 3000 breeders, with most cattle of 3/4 Brahman or higher. Higher grade Brahman bulls are used.

Pasture improvement has been practised on Hillgrove since the 1960's when the first buffel grass was planted. In recent years a CSIRO pasture site on the Hillgrove basalt has demonstrated the value of pasture improvement, and given station plantings further impetus, particularly the planting of buffel, *Urochloa*, and *Seca* and *Verano* stylos. These plantings, although still small in relative terms, have proved capable of almost doubling stocking rates and are particularly beneficial for weaners. The Hillgrove philosophy with improved pastures is 'long term', one of small plantings each year, particularly along laneways and fencelines, rather than undertake more 'risky' large scale plantings.

Marketing on Hillgrove has seen a steady change from the early 1970s, when British breed cattle and 5-year-old bullock turnoff were a feature, to the present policy of selling high grade Brahman 3.5-year-old bullocks. The target turnoff weight is a 300 kg bullock carcass although in seasons less favourable to growth, weight can average down to 285 kg. In 1991 for example very few bullocks reached 300 kg. This reflected poor growing conditions in 1991 and early selling in anticipation of a 'dry' year. The market for Brahman export heifers is regarded as very important and 'overselling' of heifers is practised when this market is favourable. In this situation culling and sale of dry cows is reduced to compensate for lower heifer numbers available as replacements. Turnoff is usually around 1800 to 2000 head per year with females comprising 45–48% of sales.

The decision support program 'Beefman' is used to evaluate marketing strategies continually. Modelling has confirmed the present bullock turnoff strategy to be more profitable than selling store steers, particularly with branding rates of around 70%. The program revealed that a policy of store cattle production could compete profitably with bullock turnoff only if branding rates were at least 80%. However, this could be achieved only by increasing supplement costs for cows and weaners and by increasing the cow herd by 50%. This was considered too 'risky' for country which averages 1 drought every 5 years.

Female cattle sales, as a percentage of total cattle sales, have increased over the last decade from 4.1% to 45–48%. This is a useful indicator of high breeding herd productivity, particularly in relation to branding rates and female mortality. This indicator using objective sales data over time and relying only on the assumption of relatively low male cattle deaths is considered more reliable than 'branding rate'.

A general policy of overmating heifers is followed using maiden bulls. The objective is to keep heifers segregated until mated for the second time. Three or 4 musters of cows are carried out each year and any breeders over 4 years of age, in fat saleable condition between March and July are usually sold. Similarly any cows remaining on the property at 8 years are culled for age. Calves are usually weaned down to 4 months of age except in very dry conditions when calves 2-3 months of age are also weaned. Weaners are segregated on the basis of age and younger groups are supplemented with true protein.

Most bulls are bred on the property, with the occasional bull purchased 'off property' to make up the numbers, and to enable a bull ratio of around 5% to be maintained.

Hillgrove is managed with 3 permanent staff and 3 part-time, contract musterers. A flexible approach to management with clear objectives for labour efficiency and herd productivity, married to a land care philosophy, will auger well for Hillgrove into the future.

CONCLUSION

For the industry to maintain market share and profitability, Australian cattle producers must produce cattle which meet increasingly tight market requirements. Although north Queensland's principal markets are the relatively unspecific, USA manufacturing meat market and the store market, younger turnoff age will affect northern producers. In the future younger animals are likely to be required for both premium beef markets and store cattle markets.

Most herds will have to lift their performance substantially if they are to adopt younger turnoff. In addition, a major shift in the relativity of prices for different age groups will be required for younger turnoff to be viable for many producers. This is particularly so for weaner turnoff. Younger turnoff will increase the labour requirements and drought susceptibility of herds. Many producers will require a substantial price premium to justify more intensive management. However, producers who raise herd productivity through improved management will not only receive higher returns but may be able to supply a wider range of markets which should improve long term profitability and viability.

A range of management strategies to improve breeder herd efficiency have been developed and proven in northern Australia. Key factors are segregation and management of key classes of cattle, early weaning and improved nutrition. Most economically important infectious diseases can be controlled with vaccines. Technologies are available to improve the growth rates of male cattle. These strategies enable the production of a heavier and consequently more profitable animal for current markets. They may also enable the production of younger cattle suitable for premium markets.

Property management is becoming increasingly intensive and this trend will be accentuated by changes in beef markets. Producers will need to monitor market developments and modify their production system accordingly. Of greater concern to producers than increasingly specific markets is the stability of their enterprises in the face of seasonal fluctuations and increasing market volatility. A range of decision support programs is available and these can play a key role in improving management. As well as improving productivity and management, producers must ensure that they are operating a sustainable production system.

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