final report

Project code: **M.544a**

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Date published: **February 1995**

ISBN: **9781741917888**

PUBLISHED BY
Meat & Livestock Australia Limited
Locked Bag 991
NORTH SYDNEY NSW 2059

Input Requirements for Cattle Feedlot Industry

Volume 1: Summary & Strategies

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government to support the research and development detailed in this publication.

VOLUME 1 - SUMMARY AND STRATEGIES

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ACRONYMS AND ABBREVIATIONS

ABARE	Australian Bureau of Agriculture and Resource Economics
ae	adult equivalent = 450 kg liveweight cattle
ALFA	Australian Lotfeeders Association
AMLC	Australian Meat & Livestock Corporation
APEC	Asia & Pacific Economic Conference
BIA	Beef Improvement Association
CCA	Cattle Council of Australia
c&f	costs & freight
CRC	Cooperative Research Centre
cwe	carcase weight equivalent
CSIRO	Commonwealth Scientific & Industrial Research Organisation
DRDC	Dairy Research & Development Corporation
evao	estimated value of agricultural operations
fas	free along side
fmd	foot & mouth disease
fcr	feed conversion ratio
GATT	General Agreement on Tariffs and Trade
GMI Model	Global Meat Industry Model
kt	kilotonne
LIPC	Livestock Improvements & Promotion Corporation (Japan)
MATFA	Meat & Allied Trades Federation of Australia
MRC	Meat Research Corporation
OECD	Organisation for Economic Cooperation and Development
pcw	production carcase weight

1. BACKGROUND

Objective of the study

This study aims to "provide an outline to the year 2000 of major global market demand and local supply factors to assist the Australian lotfeeders to respond appropriately with respect to growth of the Industry and supply to the Industry of agricultural inputs, principally cattle and grain. The research will provide an Industry strategy for progressing the supply issues while leaving individual options and choices to individual Industry participants in their particular circumstances".

Our Approach

This is the first time that any comprehensive study has examined the prospects for feedlots in Australia and the study has identified the need for and developed a better method of analysing supply and demand issues for the feedlot industry. The study has involved close consultation with the Feedlot Industry and the various organisations providing support to the cattle, grain and feedlot industries.

An Overview of the Industry Situation

Industry structure

The feedlot industry in Australia has two distinct sub-sectors — the formal sector represented by the major feedlots (over 500 head) and an informal or opportunity sector comprising smaller feedlots often integrated with grain production as a farm enterprise. In terms of animal numbers, the formal sector with 1.18 million head annual throughput accounts for 59% of the estimated 2.0 million cattle which were grainfed in 1994 in Australia. The informal or opportunity feedlot sector has not been surveyed and its size and performance is largely unknown. It supplies both the domestic and overseas markets directly but it also supplies the formal feedlot sector with some unfinished cattle. The feedlots in the informal sector compete with the formal sector for access to inputs.

Recommendation 1.
Given the size and importance of the opportunity feedlot sector, it is critically important that this sector be surveyed and its performance analysed to maximise efficiency of the total beef industry.

The drivers for rapid growth

Both sectors of the feedlot industry have grown very rapidly in response to two major changes in the demand for beef. The first and dominant change has been the liberalisation of the market in Japan

and the second has been the move to domestic consumption of grainfed or grain-finished beef as a means of improving consumer satisfaction with beef. At present, the Japanese market accounts for about 62% (733,000 cattle out of the estimated total of 1,183,000) of the cattle being turned off from the formal feedlot sector. (Data are unavailable for the informal sector). The domestic market for cattle that are fed at least 70 days accounts for a further 33% (394,000 hd) of the turnoff. The remaining 56,000 cattle of the 1.18 million cattle that are turned off in the formal feedlot sector are directed to the small but growing market in Korea.

An increasing number of grassfed cattle are also partly grain-finished, particularly under poor seasonal conditions. We estimate that some 249,000 head of the so-called grassfed cattle turnoff may be partly grain-finished at present. Feedlotting has provided the opportunity for greater specialisation in beef production in Australia and this has improved the overall efficiency of the beef production systems of Australia. Under adverse conditions such as those now experienced over most of the continent, feedlots have provided outlets for cattle that might otherwise have been unsaleable.

Steady Growth has been accommodated

Despite the very rapid expansion of lotfeeding, there have been no serious shortages of cattle nor, until the recent drought, has the repid increase in grain feeding led to shortages of feed inputs. Although there have been regional shortages, these have been accommodated by grain and cattle transfers from other regions. Regional shortages have been a feature of the industry in Queensland where a relatively long run of poor seasons in northern Australia followed by the current drought has led to serious grain shortages.

Although the feedlots have been able to source sufficient cattle to meet their requirements without major difficulties, further growth in the B3 market segment may become constrained by availability of suitable cattle, particularly Angus, Murray Grey and Shorthorn. At current demand levels for the Japanese B3 type cattle, some 50% of all the available supplies of suitable steer calves are required to meet demand. Although the industry may be meeting demand and supplying sufficient numbers of cattle, many of these cattle are not performing as well as expected and there are considerable losses through downgrading. Whilst such inefficiencies have been absorbed in the past, growing competition in the global markets will make it essential that overall performance is improved so that Australia can maintain a competitive edge.

One of the key factors that has helped the feedlots meet demand has been the steady increase in carcase weights over the past five years. The feedlots have helped this trend by providing consumers with tender meat from heavier carcases whereas in the past consumers had relied on the fact that the meat came from young animals (with lighter carcases) as their best assurance of tenderness.

Three major feedlotting areas have developed

The largest concentration of feedlots has been in southern Queensland (Darling Downs) which has a capacity of around 259,000 head or about 48% of the May 1994 total capacity of 542,000 head. (This is based on the ALFA Survey and only includes feedlots with a capacity in excess of 500 head). NSW has two major feedlotting regions—the Northern Slopes and the Riverina—with a combined capacity of around 187,000 head or 35% of the total. The feedlots of the Northern Slopes are supplied with cattle from the surrounding area and from Queensland. The feedlots of the Riverina are supplied from the surrounding area and from elsewhere in NSW, Victoria and South Australia. Victoria has a capacity of around 45,000 and there is only a small formal feedlot industry in WA at this stage with a capacity of around 40,000 head.

Feedlot utilisation has been reasonable

Feedlot capacity has expanded at almost 50,000 head per year since 1990 but the expansion has matched market demand and levels of utilisation have remained reasonably high. According to the ALFA Survey of September 1994 snapshot feedlot utilisation at that time was 69%, down somewhat on the average of 77% since 1990. Based on our breakdown of feedlot occupancy (for feedlots with capacity >100 head) by target markets, which takes into account variations in time on feed, we estimate that average feedlot utilisation for 1994 is around 73%.

Feedlots have provided strong markets for grain

Feedlots now require about 1,506 kt of feedgrains annually which represents about 28% of the estimated 5,453 kt of feedgrains used in Australia by all livestock industries at present. At the same time that the feedlot industry has been growing rapidly, the dairy industry has expanded its use of grain supplements to around 1,175 kt annually. The development of the feedlot industry and use of feedgrains in dairying has doubled the domestic demand for feedgrains over the past ten years.

Whilst in normal seasons this demand has been easily absorbed, there are emerging signs of regional shortages and there is insufficient capacity to cater for demands under extreme drought conditions as experienced currently. In addition, whereas in the past the domestic demand for feedgrains was approximately equal to export demand for feedgrains, this is no longer the case. Domestic demand of 5,453 kt compares with exports of around 3,500 kt and hence the feedlot (and other grain users) are moving into a new role as price makers rather than price takers.

Growing competition in major global markets

Australian feedlots have a narrow market focus with only two international markets. In both those markets they are meeting strong and growing competition from US exporters who are operating with the benefits of a much larger domestic market providing scope for economies of scale and potentially

stronger political support in the context of trade liberalisation. In addition, as a result of the current stage of the cattle cycle and domestic consumption patterns in the US, exporters are likely to have access to considerable volumes of grainfed beef for the next two to five years.
Owing to the greater size of the US feedlot industry and the stronger trading relationships that the US has with the markets of Japan and Korea, the US tends to be the price maker in those markets. In contrast, Australian exporters find themselves to be relatively weak sellers and largely price takers.

2. OUTLINE OF GLOBAL MARKET DEMAND

Before considering the prospects for grainfed beef, the study examined the global market demand for all beef (grass-fed and grain-fed) up to 2005 and estimated Australia's likely share of that demand. The global meat industry (GMI) model developed by the Meat Research Corporation (MRC) was used to provide a consistent analysis that balances supply and demand throughout the world. The model was modified to ensure that the projected exports to Japan in 1994 matched the product volume targeted on the Japanese market by Japanese-owned feedlots in Australia. This was achieved by including a 'vertical integration factor' in the form of a 10% lower effective tarriff on Australian product entering Japan in comparison with the US product. The five key scenarios and four sensitivity tests used with the GMI model cover the range of market demand and supply outcomes considered possible over the next ten years. Although the main report provides details of all scenarios, in this summary we present only the baseline and the "extreme scenarios"— those that would generate the highest and lowest demands for Australia's grain fed beef. This summary also deals only with the period to 2000.

The basis used for comparison of all GMI projections is the 1994 data. The values used for 1994 have been reconciled with AMLC estimates. All volume estimates presented below are in Production Carcase Weight equivalent unless indicated otherwise. (See Box for explanation of Production Carcase Weight).

The Baseline Scenario

The baseline scenario projected by the GMI model is that Australia's total beef production will increase 14% over 1994 by 2000 and that exports will increase 21% over the same period. The average annual increase in total beef exports up to 2000 is projected to be 40,000 tonnes and of the total increase of 239,000 tonnes, 40% is expected to go to Japan, 20% to "Other Markets", 12% to South Korea, 10% to both the US and to Canada and 4% to Taiwan.

Production Carcase Weight (pcw)

Production carcase weight, (pcw) is used to express the carcase weight of slaughtered animals throughout this report rather than carcase weight equivalent (cwe). The pcw is the carcase weight of slaughtered animals required to supply the shipped weight of a particular market segment PLUS trim which would be diverted to another market.

The traditional methodology is to assume that boned out shipped weight is 67% of carcase weight. Thus shipped weight is divided by 0.67 to convert to carcase weight (cwe) and this carcase weight is divided by the relevant average carcase weight to estimate the number of animals slaughtered. The study has identified that this results in a substantial underestimation of animals grainfed for export (with an offsetting increase in the recorded grassfed exports). The number of animals estimated by this cwe methodology cannot be reconciled with industry production information (eg specification of number of animals on feed).

For example, the shipped weight of grainfed beef into Japan in 1994 was 112.6 kt. It is estimated that the carcases used to produce this 112.6 kt would produce another 50.7kt of trim. The real carcase weight (ie pcw) required to produce the recorded 112.6 kt shipped to Japan is (112.6 + 50.7)/ 0.67 = 243kt. In comparison the traditional methodology would estimate the carcase weight at 112.6/0.67 = 168kt. Using the revised methodology results in a 45 percent increase in the estimated number of animals fed for Japan in 1994.

The Extreme Scenarios

The results of the extreme scenarios are summarised in Table 1 below along with the baseline scenario. This suggests that Australia's total beef exports are projected to increase between 11 and 18% between now and 2000 depending on which scenario (or combination of scenarios) is assumed to apply over the period.

Table 1. Key Projections for Australia's Total Beef Production and Exports

	Pessimistic	Baseline	Optimistic
Total beef production (2000) pcw	2,009,000 T	2,074,000 T	2,154,000 T
Projected increase in beef production 1994 - 2000	191,000 T 11%	256,000 T 14%	336,000 T 18%
Total beef exports (2000) pcw	1,301,000 T	1,380,000 T	1,472,000 T
Increase in total beef exports 1994 - 2000	160,000 T 14%	239,000 T 21%	331,000 T 29%
Percentage change in market share of export increase '94 - '00	Japan 34% Other 26% Korea 22% US 0% Canada 13% Taiwan 5%	Japan 40% Other 20% Korea 12% US 10% Canada 10% Taiwan 4%	Japan 43% Other 20% Korea 25 % US 3% Canada 6% Taiwan 3%

Sensitivity Tests

A number of possible global supply and demand developments were analysed using the GMI model to test the likely impact on Australian export of beef.

- Increased supplies of grainfed beef from the US would compete directly with Australia in the North Asian markets. If US grainfed beef supplies were to expand 10% faster than projected in the Baseline scenario (ie 1.25% per year rather than 1.14% per year), Australian total beef exports for the period 1994-2000 are projected to be 346 kt lower than the Baseline of 8,924 kt over the period. This would mean an average of 49 kt/year below the Baseline.

- The impact from greater competition from South American countries as a result of early removal of FMD bans and the supply of discounted meat into the Pacific Rim markets was relatively minor up to 2000. In this period the worst case would only reduce total exports by an average of 9 kt per year and this would only be in the last 3 years of the decade. However, beyond 2000, the competition would reduce Australia's exports by about 18 percent below Baseline.

- The competition for land that would result from a resurgence of wool prices and a 25% improvement in the profitability of wool relative to beef production would have little or no effect up to 2000.

3. MARKET DISAGGREGATION AND CATTLE REQUIREMENTS

Market Segments

This study is the first time that the total demand estimates generated with the GMI model have been disaggregated into the range of beef products produced by the Australian beef industry. The distribution of Australian grainfed beef production amongst the six export and two domestic market segments was estimated to be as indicated in Table 2. The study developed a new procedure to translate these shipped volumes into slaughter cattle and feedlot entry numbers. The results of this disaggregation are summarised for the 1994 base year in Table 2.

Table 2. Estimated Distribution of Australian Grainfed Beef Market Segments and Cattle Requirements 1994

Market Segment	Share	1994 Shipped Volume	Estimated Cattle Requirements (Thousand head)
Exports			
Japanese B3	17.4%	22.2 kt	174
Japanese B2	33.1%	42.1 kt	287
Japanese B1	27.8%	35.4 kt	162
Japanese Yearling	10.1%	12.8 kt	110
Korean Quarter K1	11.0%	14.0 kt	50
Korean Fullsets	0.6%	0.7 kt	6
Export Total	100.0%	127.2 kt	789
Domestic			
Grainfed >70 days			394
Grain supplemented			819
Domestic Total			1,213
Total Grainfed			**2,002**

Possible Market Segment Shifts

The team examined the possible future shifts between market segments over the projection period and suggested that the following changes are most likely:

- Given the higher production costs in Japan and a move by the US feedlot sector to slaughter cattle at an earlier age (and hence low marbling level) the Japanese B3 offers opportunities to Australian feedlotters to increase market share if it improves its efficiency in producing for this segment.

- The Japanese B2 will be a highly contested price sensitive part of the market but Australia has scope for cost leadership using northern Australia's production base in the pastoral zone followed by backgrounding in the wheat/sheep zone.

- The Japanese B1 market is expected to decline at the expense of the more profitable B2 and the Grainfed Yearling which will be preferred by the younger generation because of its tenderness and greater leanness.

- The Korean market will definitely change and the products required will be similar to the Japanese market but excluding B3.

- The Australian domestic grainfed market is expected to grow steadily at the expense of grassfed beef and account for 50% of total consumption by 2000.

Cattle Requirements

The same process was used to estimate the numbers of cattle required for each year to 2000 and for the year 2005 for each scenario. In the Baseline scenario it was projected that the feedlots would require 2.192 million cattle by 2000. In the most Optimistic scenario the estimated feedlot requirement for 2000 was 2.282 million head whereas in the Pessimistic scenario they were 2.190 million.

Consistent with the study team's expectation that there will be significant market shifts in both domestic and export markets, a significant increase in feeder cattle will be required, amounting to some 2.649 million head by 2000 or 21 percent above the requirements under the Baseline scenario.

The total requirement for cattle to meet the various market demand scenarios is summarised in Table 3 below. Importantly, it shows that in general the higher the proportion of total demand that is met by grainfed beef, the lower the total requirement for cattle becomes.

Table 3. Estimated Cattle Required to meet demand for Beef in 2000

	Numbers Required in 2000 (Thousand head)		
	Feedlot	Grassfed	Total
Baseline	2192	7141	9333
Optimistic Demand/Competing Supply	2283	7339	9621
Pessimistic Demand/Competing Supply	2190	6891	9081
South American FMD Free	2211	7048	9259
High Wool Price	2185	6991	9176
Productivity Boost in Australian Beef Industry	2598	6964	9562
Lower Dairy Beef Production in Japan	2212	7210	9422
Market Shifts	2649	6638	9285

Grain Requirements

The grain requirements for feedlots were estimated based on preferred feeding regimes for each market segment and the estimated cattle on feed for each scenario. The total annual grain requirements under the various scenarios range from a low of 1689 kt to a high of 2235 kt. This compares with a current requirement of 1506 kt.

4. IMPLICATIONS FOR FEEDLOT INPUTS

Cattle Requirements

Total Requirements

Based on the global supply and demand analysis carried out in this study, Australia will be slaughtering somewhere between 9.0 and 9.6 million cattle by 2000, an increase of between 820,000 (10%) and 1.36 million (16%) over the next six years. This increase could come either from a national herd of current size with improved productivity or from a larger national herd. Given the need to generally improve competitiveness and the pressure to use land more efficiently, it is likely that the major change will be towards improved productivity.

The productivity of the national beef cattle herd can be improved by structural change and specialisation and by enhanced biological and managerial efficiency. One of the major benefits of the growth of the feedlot sector is that it makes it possible for Australia to use its land resources more efficiently. Through use of feedlots, beef production can be expanded without requiring more land for grazing.

Grainfed Cattle Requirements

The numerical requirements for feeder cattle are modest and can be easily met. As indicated in Table 3, Australia will be slaughtering somewhere between 2.2 and 2.6 million grainfed cattle by 2000. This represents an increase of between 184,000 (9%) and 647,000 (32%) over the next six years. Provided that the feedlot industry is offering prices for feeder cattle that are competitive with other market opportunities, there is unlikely to be any numerical shortage of feeder cattle. However, unless the quality of feeder cattle is improved, there may be shortages of the feeder cattle required to meet specific market opportunities. It is likely that access to the higher value Japanese B3 market will be constrained by the number of cattle available that are suited to that market. Similarly, unless the efficiency of the total beef industry in Australia is improved and the level of downgrading reduced, Australia's market share in the highly competitive North Asian markets will be constrained by the limited numbers of cattle that can be efficiently grainfed to deliver a product that can compete with the US over the next 5 - 10 years.

Grain Requirements

The total production of feedgrains (excluding wheat) in Australia is projected to be in the range of 8,500 kt to 9,000 kt in the period up to 2000. Since on average there is an additional 1,000 - 2,000 kt of downgraded wheat available to the pig and poultry industries, the supply of feedgrains exceeds the projected demands of all feedgrain users (6,043 kt) by about 3,500 to 6,000 kt. However, assuming that exports remain in the range of 3,000 to 3,500 kt as projected by ABARE, it is clear that supply and demand are closely balanced. Hence, whereas in the past the domestic feedgrain users were able to secure the smaller volumes needed relatively easily, in the future they will be competing with other users and exporters to a greater degree.

At the national level the Australian grain industry is unlikely to face any serious difficulty in meeting the projected grain requirements of the feedlot industry over the next ten years provided that the feedlot industry is prepared to meet world prices. Total grain requirements are projected to increase somewhere between 207 kt and 729 kt in the six years to 2000.

It is likely that regional shortages will occur occasionally particularly in the Darling Downs. These will require transfer of grain from other regions or, under exceptional circumstances, importation from overseas. The industry needs to explore possible options for reducing the regional grain shortages.

Given Australia's climatic variability, it is also inevitable that there will be occasional severe droughts that limit the supply of feedgrain for one or perhaps two seasons. If Australia's feedlot industry is to compete successfully with the US, it will be essential that a procedure be established for the industry to import feedgrains in a cost-effective manner when necessary.

5. CHANGES NEEDED IN INDUSTRY OPERATIONS

The key change needed is to improve overall efficiency so that Australia can compete successfully against the US in the short term and against new entrants in the longer term. This will require change in three key areas as indicated below.

- The structures of the feedlot industry and those industries providing inputs to it needs to be modified to make best use of Australia's comparative advantage. This will require changes at the regional and farm level in the form of specialisation in accordance with the natural advantages of particular regions and farms. It will also require changes at the industry and firm level in the form of rationalisation of numbers and feedlot capacity and the development of new strategic alliances with domestic suppliers. This is also expected to include rationalisation of the large opportunity feedlotting sector.

- The production systems used to produce feeder cattle need to be modified and specialised to meet the specific requirements of the customers of the feedlot industry. The beef industry must recognise that the feedlot industry has become a major and permanent part of the total industry and that it has specific requirements that must be met. To a lesser extent, similar changes are needed in the feedgrain industries. These industries need to recognise the growing importance of the feedlot industry and seek to meet their specific needs more efficiently. This may require the development of modified production systems particularly at the regional level.

- The marketing systems used to provide inputs to feedlots and to distribute outputs need to be improved so that they can operate more efficiently and help convey the appropriate price and demand signals needed to drive the changes in structure and production systems that have been outlined above. Most importantly, there needs to be much more effective communication between the feedlot industry and its suppliers of inputs, particularly feeder cattle. This also needs to be linked with an effective grading system. There also needs to be improvement in beef distribution along with better access to distribution channels in overseas markets. To a large extent improvements in distribution will be the responsibility of individual firms through their strategic alliances.

6 RECOMMENDED STRATEGIES

Goal and Broad Strategies

The overall goal should be to improve the total efficiency of the grainfed beef production system. The ultimate measure of the total efficiency will be the cost of production in Australia in comparison to that in the US and other competing suppliers. The three broad strategies that are recommended to achieve the goal are to:

- Hasten structural change in the cattle supply, grain supply and feedlot industries.

- Facilitate improvements in cattle supply production systems

- Accelerate improvements in cattle, grain and grainfed beef marketing systems.

Structural Change Strategies

Change in the structure of the Cattle Supply Industry

The objective should be to facilitate the structural changes that will improve efficiency through specialisation and changes in the types of enterprises carried out on farms. In particular, this will involve changes in the northern part of Australia with an emphasis on breeding in the pastoral zone and earlier transfer of young stock for growing out in the endowed (wheat-sheep) zone. It will also include the emergence of specialist operators who will "background" cattle for feedlots in the northern and southern regions. The existing trend towards specialisation evident in the industry, particularly in northern Australia, needs to be accelerated.

Recommendation 2
Promote stratification of production systems in the northern pastoral zone to encourage earlier turnoff of cattle from the pastoral (harsh) zone and their transfer to better growing areas in the sheep/wheat (endowed) zone.

Recommendation 3
Promote substitution of feedlot finishing for grass finishing production systems in the endowed zone to turn cattle off grass in the endowed zone at an earlier age and finish them in feedlots rather than holding on the farm to produce grassfed Japanese Ox.

Recommendation 4
Investigate means of using the dairy beef bobby calves in southern Australia for feedlot finishing to supply dairy beef in Japan as domestic supplies decline.

Change in the structure of the Grain Supply Industry

The competitive ability of the feedlot industry (and in fact the whole beef industry) is constrained on occasions by its access to competitively priced feedgrains. Whilst Australia can generally provide feedgrains at world prices, its supply capacity is subject to seasonal variation to a much greater extent than that of the US feedlot industry with which it is directly competing. There are two structural changes needed in the grain supply industry to assist in the overall objective of improving the efficiency of the total beef industry.

The first is an improvement in the regional supply and demand balance. In those regions such as the Darling Downs where grain demand is outstripping supply capacity, there can be benefits to both feedlotters and grain producers from greater local production of feedgrains. The major constraint to the expansion of feedgrain supplies at the local level is that at current prices feedgrain production is less profitable than other alternatives.

Recommendation 5
Feedlots need to examine the extent to which it is worthwhile offering a feedgrain premium over national "parity" prices to expand production on a regional level.

In some circumstances there may also be technical constraints but given the long gestation period of breeding work and the likelihood of increasing liberalisation of grain movements over time, it is unlikely that there would be any merit in developing R & D programs to serve a local regional supply shortfall.

The second change needed is greater flexibility in the use of grain imports in times of national grain shortage such as at present. The current requirements for the importation and use of feedgrains are unnecessarily costly and will seriously reduce the competitiveness of the feedlot and cattle industries. The risk associated with feedgrain imports needs to be carefully assessed and compared with the cost to the Australian intensive livestock industries in times of national grain shortages.

Recommendation 6
ALFA and MRC should quantify the benefits and risks of the importation of feedgrains and continue efforts to lobby for increased liberalisation of importation regulations along with other feedgrain users and beef cattle producers. At the time of publication of this report this recommendation had largely been achieved by efforts of MRC and ALFA.

Change in the structure of the Feedlot Industry

The objective should be to create an environment that will lead to a feedlot industry structure that will be the most efficient for the beef industry as a whole. In the informal or opportunity feedlot sector there is no information available to indicate its efficiency. Given the very large numbers of cattle involved and the lack of data, it is recommended that this sector be closely studied as a matter of some urgency. (See Recommendation 1)

In the formal feedlot sector the structural issues that are most important in terms of industry competitiveness are: the numbers/size of feedlots and their effect on capacity utilisation; the nature and extent of the strategic alliances with distributors and their effect on gaining market share and

diversifying markets; and the degree of vertical integration and its effect on competition and competitiveness.

Although there is a high degree of uncertainty concerning the capacity in the informal sector, the study estimated the present capacity of formal and informal feedlots (>100 head) amounts to 660,000 head with average utilisation of 73% for 1994. Demand projections for high feedlot use scenarios carried out under this study suggest that a dedicated feedlot capacity of about 800,000 head will be required by 2000. If 50% of the informal sector is absorbed into the formal sector, the required dedicated feedlot capacity would rise to 900,000 head by 2000. The expansion plans reported by the industry total some 540,000 head which would bring capacity to 1.2 million head by 2000. This implies that there will be a need for some rationalisation of expansion plans and possibly for a reduction in feedlot numbers if operators believe that expansion of scale is required for competitiveness of individual firms. This will inevitably lead to some increase in concentration of ownership and control in the feedlot industry. Provided these changes are accompanied by improved efficiency while maintaining an equitable share of returns amongst all sectors of industry, they will be in the long term advantage of the total industry.

Recommendation 7
ALFA should encourage its members to review plans for expansion in the light of the demand estimates presented in this study.

The Australian beef industry as a whole would benefit from the creation and strengthening of strategic alliances between Australian feedlot operators and distributors in overseas markets. These alliances have already being established with operators in Japan but the industry should encourage other parties such as the Koreans and the Chinese by providing the opportunity to obtain some share of the Australian feedlotting capacity as part of the rationalisation process. There are benefits to the whole industry if the ownership base can be widened to include more of the distributors in the future market areas.

Recommendation 8
ALFA should encourage its members to develop strategic alliances into overseas markets and should explain the benefits of such alliances to the beef industry and wider public.

At this stage there is little, if any, objective information that would indicate the extent to which vertical integration of a feedlot firm with domestic cattle and grain suppliers and meatworks enable them to operate more efficiently than other firms. It would be in the interests of the total industry to have more information on the relatively efficiency of vertically integrated operations and to assess whether this trend should be influenced in any way by industry action.

Recommendation 9
ALFA and MRC should assess whether or not vertical integration improves overall industry efficiency.

Production Systems Strategies

Cattle Supply Systems

The objective should be to facilitate the development and adoption of production systems that will improve industry efficiency by addressing the present shortcomings (high level of downgrading of feedlot entrants) and by providing technologies for backgrounding and the improvement in overall farm level production efficiency. Improvements are needed particularly for the Japanese B3 segment where there is the largest gap between what the market wants and what producers are currently able to provide. Feedlot operators must provide the financial incentives to reward those producers that adopt the practices.

In order to improve overall efficiency and to provide Australia with a competitive advantage over other new entrants into the grainfed beef market there is a need for ongoing genetic improvement through the identification of desirable traits and selection for those traits in production herds and sires. The work already underway at the Cooperative Research Centre Armidale and elsewhere needs to be accelerated and widened so that producers have access to preferred genetics and so that inferior genetics can be identified and eliminated from the national herd as quickly as possible. In particular, genetic improvement must reduce the very high variability of performance of apparently similar cattle in feedlots in terms of feed conversion, carcase yield and meat quality.

Recommendation 10
ALFA and MRC should support a progeny testing program at CRC Armidale for all breeds of cattle to identify animals with preferred attributes, including meat quality and marbling, and to provide information to breed societies and other interested parties

Recommendation 11
Feedlots should offer premiums (or discount non-compliers) to suppliers of feeder cattle meeting specified performance targets

Recommendation 12
ALFA, MRC , CCA and BIA should implement an awareness program to promote the use of superior genetics in feeder cattle breeding herds

There are a range of measures that need to be improved in the general herd performance so that the feedlot industry can operate at a high level of total efficiency. Most of these measures are already being addressed by the CRC Armidale, MRC, Departments of Agriculture and other service providers.

It will be necessary to greatly expand the numbers of feeder cattle that are backgrounded to accommodate the structural changes recommended in this study. Backgrounding will reduce the total number of cattle required to meet the total demand for Australia's beef by better matching the requirements of the growing feeder cattle to the fodder available. It can also provide the basis for improved feedlot efficiency by culling out those cattle that will not perform well in the feedlot. In addition, backgrounding offers a means of improving the availability of feeder cattle by regulating the flow into feedlots and partially offsetting the seasonal peaks in supply of feeder cattle.

Recommendation 13
Backgrounding should be promoted as a specialist operation and performance standards should be developed along with recommendations for practice in specific locations that offer particular benefits to the feedlot industry.

Recommendation 14
CRC Armidale, MRC and ALFA should provide information to producer organisations, state departments and to BIA and encourage the conduct of trials to demonstrate the costs and benefits of backgrounding to producers in different areas.

Recommendation 15
Individual feedlot operators should offer forward contracts to backgrounders including premiums based on the subsequent performance of the cattle in the feedlot. ALFA may be able to assist the feedlotters in developing appropriate contracts and provisions.

Recommendation 16
MRC and BIA should examine the advantages and disadvantages of alternative ownership arrangements for cattle that are being backgrounded in order to be able to advise whether it is in the interest of the industry as a whole for cattle producers to retain ownership of the cattle further down the marketing chain.

Grain Supply Systems

The scope for improvement in the grain production systems is limited and the major focus should be on the opportunity to address regional imbalances and the need to liberalise feedgrain importation. While security of feed supply is clearly a problem in times of national feed shortage, at other times it is not and feedlotters showed no clear commitment to forward contracts or other means of obtain forward supplies. Similarly, while the nutritive value and particular attributes of the grain used are clearly important, feedlotters were unable or unwilling to define their requirements more precisely than they are now doing. Hence there seems little scope for development of more specifically focused feedgrains given the capacity of feedlots to handle a variety of feed grains with different attributes.

An increasing number of feedlots are producing at least part of their own feed requirements and it would be in the interests of the grain industry to assess whether this trend was likely to continue. (See Recommendation 9)

Feedlot Production Systems

The Terms of Reference for this study did not include the feedlot production systems but clearly these need to be assessed if industry is to ensure that it is taking all steps to become a world leader in grainfed beef production.

Recommendation 18
ALFA should assess the efficiency of feedlots in Australia in comparison with its competitors in the US.

Marketing Systems Strategies.

Market Signals and Communications

The objective should be to ensure that producers of feeder cattle and grains were better informed as to the requirements of the feedlots and that they were adequately and fairly rewarded/penalised to the extent that their inputs met the performance criteria.

The feedlot industry must improve the level of understanding and acceptance of feedlotting amongst its suppliers. At present, the importance of the industry is not generally acknowledged with the result that input suppliers are still not targeting the feedlot industry with their products. The feedlot industry itself has done little to change this situation and perhaps feels that it is to its advantage to take the role of just one other buyer in the market for inputs. However, owing to the rapid growth of the feedlot industry, it has now moved to a situation where it tends to be a dominant force in the market and to set prices rather than to accept the prices others set. Accordingly, it will have to modify its stance and provide clear market signals if it is to continue to remain competitive.

Improvements in communications are needed in order to: convince input suppliers that this is a market worth following and serving well; clearly specify the inputs needed so that producers can plan for their supply over the medium term; and to strengthen the sense of mutual inter-dependence amongst input suppliers and feedlot operators and processors so that they can collaborate to improve quality and build competitive strengths in advance of increasing competition in the future. Much of the improvement in communications needs to go to strengthening the market signals and providing better feedback on performance so that producers are able to respond objectively to performance shortfalls.

Recommendation 19
The initiatives already underway to improve the communication of market signals need to be supported and extended if necessary to meet the specific requirements of the feedlot industry.

Market Intelligence

One of the findings of this study has been that the information available to feedlots on Australia's own meat production and trade are presented in a form that is inappropriate for industry planning and analysis. A large part of the effort of this study has been directed to developing a procedure for providing statistics on the basis of market segments rather than the present aggregation which is of little value to the feedlot industry. The procedure developed as part of the study provides a reliable basis for translating estimates of demand for shipped product into feedlot entry requirements in terms of cattle numbers and types.

Another major shortcoming in market intelligence revealed by this study concerns the largely unrecorded informal opportunity feedlot sector. Finally, the statistics on the national herd and the regional distribution of the herd are not in a form that allows any monitoring of input availability nor any accurate projections of future supply prospects.
The objective must be to develop a market intelligence system that meets industry's needs and disaggregates production and exports according to market segments and links feedlot input requirements with output targets by market segments. It should also be linked with a regional monitoring of cattle supply prospects. The basis for such a system has been developed under this study. Further work is required to develop this to the operational level.

Recommendation 20
AMLC and ALFA should support further development of the market intelligence system initiated in this study and should implement an ongoing system to relate projections of future product demand with feedlot input requirements..

Marketing Initiatives

This study has revealed scope for a number of marketing initiatives that warrant further analysis.

Recommendation 21
MRC and AMLC should assess whether Australia should target the Japanese B3 market.

Recommendation 22
ALFA and MATFA should promote more rapid increases in carcase weights provided these were achieved using younger and more efficient animals.

Recommendation 23
AMLC, MATFA and ALFA should encourage greater overlap in the specifications of products to different markets.

Recommendation 24
In order to assist in arresting the decline in domestic consumption of beef and to help prepare Australia's capacity to expand value added exports, industry should encourage the adoption of boxed beef.

Recommendation 25
CCA and BIA should encourage the greater use of heifers.

1. INTRODUCTION

The Meat Research Corporation has commissioned a study into the *Input Requirements of the Cattle Feedlot Industry*. Rapid expansion of the lot feeding industry is challenging assumptions regarding the future structure and operation of the beef industry in Australia (eg fed beef accounted for six percent of exports in 1989 and over 18 percent in 1993).

In its initial stage of establishment the industry could rely on its relatively small size ("price taker'" status) to assure supply of key inputs (feeder cattle and feed) at competitive prices. Expansion will propel the industry to a situation where this is no longer the case, not only at the regional level, but nationally. In terms of investment and industry strategies, key questions centre around:

- The future growth in international demand for fed beef.
- The capacity of the Australian beef cattle industry to respond to increased demand (ie. its ability to expand competitively priced supply) from current production systems.
- The potential to hasten changes in the industry which would increase its ability to profit from increased demand for fed beef.

A basic tool of the study is the Global Meat Industry (GMI) Model which seeks to provide insights into the future global meat trade and Australia's part in that. This is not a forecasting exercise. The intention is to provide order of magnitude estimates of the global trade under given sets of assumptions regarding key (foreseeable) factors. The future will almost certainly be different to any of these Scenarios. Non-forecastable factors (e.g. weather and drought) and un-foreseen factors (e.g. military clashes on the Korean Peninsula, a nuclear accident and contamination in the USA) must be expected to play a significant but unpredictable part in future price and production outcomes for the industry.

This study was undertaken as seven distinct components or modules. The purpose of the respective research modules was as follows:

- Module 1 reviews the factors thought capable of exerting a significant impact on the production and trade in Australian beef over the coming ten years. These factors have been used to define the Scenarios modelled via the Global Meat Industry Model (GMI). The five key Scenarios ("baseline", "optimistic", "pessimistic", "FMD free South America" and "high wool price in late 1990's") are described.
- Module 2 assesses the prospects for global beef markets to year 2005 through the use of the GMI Model which captures the main demand and supply features of the Industry in the

interactive fashion for five plausible Scenarios and sensitivity test key parameters. The output of the GMI model, used in sequential modules of this study, is the total beef supply and demand in Australia, in other competitive supplying countries and in major country markets.

- Module 3 disaggregates the total beef demand to year 2005, described in Module 2, into specific beef products by major country markets. The market disaggregation includes beef products within the domestic grainfed market and beef products for the Japanese and Korean grainfed export markets. Possible future shifts in the grainfed beef market profile are analysed. Grassfed markets are identified only as either domestic or export. The projected demand by beef product and by market is translated into animal numbers and different types of cattle required.

- Module 4 ascertains cattle supply options to year 2005. Consideration is given to disaggregation of the herd from existing ABS data on a regional basis and according to breed and animal type. Supply shifts, produced by such factors as changing slaughter weights, processing yields, age of turnoff, mortality, productivity, culling, genetics and husbandry practices are considered. Possibilities of substitution between beef activities and the effect of out-of-normal seasonal conditions are analysed. Feedlot operators' specification for feeder cattle and the matching of feeder cattle supply with current and future market requirements is determined.

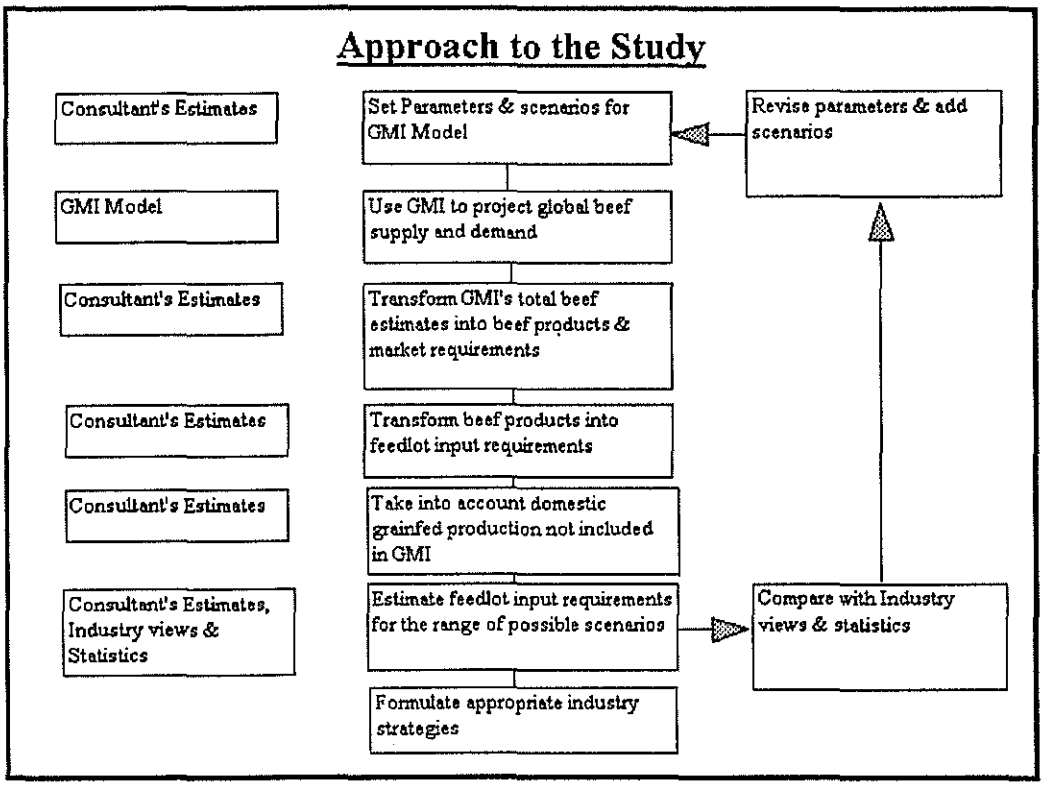
- Module 5 appraises the Australian feedgrain and other feeds supply picture as it relates to beef feedlot industry demand described in Modules 1 to 4. The demand for specified beef products is translated into demand for feedgrain and other feedstuffs based on achievable feed conversion ratios and feed-on periods. Particular attention is given to where feedlots are currently established and where they are likely to develop in the future.

- Modules 6 and 7 analyses the implications of the research results of modules 1-5 for the Australian feedlotting industry. A strategy for the feedlot industry is developed for the supplies of key agricultural inputs, specifically cattle, grains and other feeds.

1.1 Our Approach to the Study

The study has involved close consultation with the Feedlot Industry and the various organisations providing support to the cattle, grain and feedlot industries. With the assistance of the Steering Group and industry contacts, the Team has overcome the shortcomings of the data currently available and has prepared a comprehensive assessment of the global market demand and its implications for the supply of inputs to the Feedlot Industry. The general approach to the study is indicated in Chart 1.1.

Chart 1.1



The Study team members and their main areas of responsibility were as follows: Ian Sillar (team leader, cattle supply), Rick Lacey (trading environment), David Vincent (Global Meat Industry model), Greg Chappell (beef market disaggregation and cattle demand), Pat Houlahan (feedgrain supply), Greg Hayes (PDP study director and strategies) and David Crombie (GRM study director).

2. TRADING ENVIRONMENT

Major factors likely to influence the international trade in beef were analysed and compiled into a number of scenarios for which outcomes were estimated using the GMI Model. The GMI Model provides a complete balance sheet for international production, consumption and trade in meat. The model distinguishes a range of meat types, including grassfed beef, grainfed beef, pig meat, poultry, lamb, mutton and goat meat. It also identifies seafoods.

For this study, the seventeen regions shown in Table 2.1 were identified in the model. The production, consumption and trade flows are modelled and projected for each of these regions. Projections cover the period 1994-2005.

Table 2.1: REGIONS DISTINGUISHED IN MODEL PROJECTIONS

Australia	Japan	Ireland & Denmark	Argentina
New Zealand	South Korea	Other Europe	Uruguay
United States	Taiwan	Saudi Arabia	Paraguay
Canada	Other Asia	Mexico	Brazil
			Rest of World

The database of the GMI model is being updated on a continuing basis. The projections in this study incorporate, as their starting point, the latest available data on meat production, consumption, prices and trade for each region (data available to June 1994). The projections have been forced to line up with the AMLC's May 1994 forecast for the 1994 calendar year for:

- total Australian beef and sheep meat production and exports; and

- Australia's beef and sheep meat exports to major markets: US, Japan, South Korea, Taiwan, Canada, Other Asia, European Community, other.

2.1 Global Meat Demand

Economic factors, population increase and trade liberalisation have been major shift factors working in the favour of increased export demand for Australian beef. In the main, this is expected to continue.

2.1.1 Economic Factors

Real Per Capita Income

This is a key factor for future demand. Demand for meat is typically highly responsive to growth in per capita incomes, at least before incomes reach "high" levels. At higher levels of income, overall demand response may slow but real incomes will continue to drive preferences for high and reliable quality.

The GMI model captures this income effect via income elasticities and projected rates of growth in real personal expenditure. While both are key components of any simulation, income elasticities are based on best available estimates and generally treated as fixed components of the model (see discussion below regarding Japan and South American countries).

Determining a set of plausible growth rates for real incomes is not easy or straight forward. Even in the more developed/stable economies, actual performance is subject to considerable year to year fluctuation. The situation for developing countries is often volatile.

In simulations for the MRC Project, *Analysis for Increased Competition in World Beef Markets*, Baseline projections for income growth were relatively optimistic. Compared to the last decade, these projections envisage:

- Stronger growth in real incomes in OECD countries, except Japan.
- Strong growth in real incomes in Korea, but at a slower rate than the previous decade.
- Continuing strong growth in "Other Asia" (dominated by China).
- Much stronger (and more consistent) growth in real incomes in South America and Mexico.(Note that since the Study was completed Mexico's financial situation and prospects have deteriorated significantly.)

While the optimism for South American economies is shared by many forecasters, history would caution against assuming sound and consistent economic performance in that region. The reverse

has been the case for most of the post war period, with some economies (eg Argentina) having negative growth for sustained periods. Depending on the income elasticities used (see below) this is a key assumption, as beef consumption in this region is very large and hence projected changes in this region will significantly effect global demand. Assumed annual growth rates for each country under each of the key scenarios are listed in Table 2.2.

For the Baseline Scenario real per capita incomes have been projected forward after a period of recovery from recession (eg to 1996) as follows:

- OECD Countries, similar but more conservative levels to the South American Study; [1]
- South Korea and "Other Asia", as for the South American Study; and
- Mexico and South America, more conservative projections more in keeping with the experience of the 1980s (particularly for Argentina and Mexico).

For the Optimistic Demand Scenario. The assumed rates of increase in real incomes are as used in the South American Study, but with higher rates of growth in South Korea and "Other Asia".

For the Pessimistic Demand Scenario. Projections of real per capita incomes are as for the Baseline Scenario, but with lower long term growth in OECD countries.

[1] MRC funded Study M.336 "Analysis for Increased Competition in World Beef Markets".

Table 2.2: ASSUMED GROWTH IN PER CAPITA INCOMES

Country	*Year*	*GDP/capita US$*	*Baseline %*	*Optimistic Demand/ competing supply %*	*Pessimistic Demand/ Competing Supply %*
Australia	1993	16266	2.5	3.0	2.0
New Zealand	1992	12161	2.5	3.0	2.0
Ireland & Denmark			2.0	2.3	1.5
Other Europe			2.0	2.6	1.5
United States	1993	24760	2.5	3.1	2.0
Canada	1993	24753	2.0	3.0	1.5
Japan	1993	33789	2.3	3.5	1.5
South Korea	1993	7510	4.2	4.7	4.2
Taiwan	1993	10246	4.6	5.0	4.6
Other Asia			4.6	5.3	4.6
Saudi Arabia	1992	7634	1.8	2.0	1.8
Mexico	1992	3678	1.5	2.5	1.5
Argentina	1992	6854	0.0	3.1	0.0
Uruguay	1993	4173	2.5	3.6	2.5
Paraguay	1992	1227	2.0	2.3	2.0
Brazil	1992	2620	0.0	2.6	0.0
Rest of World			2.0	3.0	2.0

Demand Elasticities.

Price and income elasticities are generally treated as fixed components of the GMI model. However, these elasticities have been estimated from historical data and are most relevant in terms of small changes from these levels. For Japan in particular, the extent of change experienced in recent years and that likely to occur in coming years is fundamentally altering the structure of meat consumption.

Such large scale changes are themselves likely to generate changes in demand response. In simple terms, as beef increases as a proportion of total meat consumption, demand is likely to become less responsive to changes in incomes and possibly prices. Consumption will tend to plateau, not in an absolute sense, but relative to the demand response experienced to date.

While such an outcome is predictable from common sense and economic observation, the timing and course of such "taste" changes are difficult to predict. In the case of Japan, account must also be taken of:

- The substantial regional variation in per capita consumption.

- The fact that until recently consumption levels and choices (eg of type of beef) were constrained by import quotas and regulation. Consumption patterns post liberalisation may vary in ways not evident from analysis of pre-liberalisation consumption.

For the purposes of this study, no constraints were to be imposed on per capita beef consumption unless it rose above 14 kilogram, retail weight. (This is approximately the upper rates of consumption for pork and chicken.) This rate of consumption was not exceeded for any of the projected scenarios.

Income (Expenditure) Elasticities South America.

For these countries, the GMI model utilises income elasticities of over one, ie a one per cent increase in income results in demand increasing by more than one per cent. Some reservations have been expressed about this assumption given that these countries have unusually large per capita consumption of beef already. (Higher incomes would suggest more diversity of diet and the potential of lower consumption.) However, on the basis that relatively low rates of growth in real incomes were assumed for these countries in this study, the high income elasticities were not important to this study.

Real Exchange Rate

Real exchange rate formation is not well understood and is influenced by a variety of factors themselves difficult to predict (eg international capital/investment flows and relative inflation rates). Hence it is difficult to project real exchange rates in a meaningful sense, particularly in terms of a consistent set of changes across countries over time.

With the exception of the USA : A$ rate (discussed below) real exchange rates were assumed constant. One currency for which this assumption is notably sensitive is the Yen to US$.

Over the last two decades the real value of the Yen against the US$ has trended strongly upwards. For most of this period quota restrictions operated for imports of beef and hence the

appreciation in the Yen did not favour beef consumption. However, since liberalisation in 1992, the rising value of the Yen has resulted in lower prices for imported beef in Japan.

Despite the long run trend, there is reason to believe that the real value of the Yen will not continue to appreciate against the US$. For domestic and international reasons Japan is under pressure to reform its trade policy and liberalise access for goods and services. Failure to do so is likely to result in lower real income growth and higher unemployment (or under-employment). Removal of trade barriers will put downward pressure on the exchange rate, as may the more sluggish economic performance anticipated for Japan over the next few years.

2.1.2 Population Change

While important, this is not subject to fluctuation. The projections used in this study are listed in Table 2.3. These projections remain unchanged between Scenarios.

Table 2.3: POPULATION PROJECTIONS

Population Million	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2005*	*2010*	*2015*
Australia	17.7	17.9	18.1	18.3	18.5	18.7	18.9	19.8	20.6	21.5
New Zealand	3.5	3.5	3.6	3.6	3.6	3.6	3.7	3.8	3.9	4.0
United States	256.3	258.2	259.7	261.3	262.9	264.5	266.1	273.5	280.9	288.2
Canada	27.3	27.6	27.7	27.9	28.1	28.3	28.5	29.3	30.2	30.9
Japan	125.4	125.9	126.3	126.7	127.2	127.6	128.1	129.8	130.6	130.0
South Korea	44.8	45.2	45.5	45.9	46.2	46.5	46.9	48.3	49.3	49.9
Taiwan	20.5	20.6	20.7	20.8	20.8	20.9	21.0	21.3	21.4	21.3
Other Asia	1552.0	1575.6	1595.1	1614.8	1634.7	1654.9	1675.4	1701.4	1825.6	1897.2
Ireland and Denmark	9.0	9.1	9.1	9.1	9.2	9.2	9.2	9.4	9.6	9.7
Other Europe	318.7	319.3	319.9	320.4	320.9	321.4	322.0	322.9	322.7	321.7
Saudi Arabia	17.0	17.6	18.2	18.8	19.4	20.9	20.7	24.1	27.8	31.8
Mexico	96.0	98.0	99.8	101.6	103.4	105.3	107.2	116.3	125.2	133.8
Argentina	33.9	34.3	34.7	35.0	35.4	35.8	36.2	38.2	40.2	42.1
Uruguay	3.2	3.2	3.2	3.2	3.2	3.3	3.3	3.4	3.5	3.5
Paraguay	4.8	4.9	5.0	5.1	5.3	5.4	5.5	6.2	6.9	7.7
Brazil	162.0	165.1	167.9	170.7	173.6	176.5	179.5	193.6	207.5	221.0

Source: Based on United National Population Division projections.

2.1.3 Trade Access

GATT Round Outcome

The beef industry fared relatively well within the GATT Round. Outcomes of relevance to this study include:

- As a "side deal" to the Agreement, continuation of the Andriessen assurances to exclude subsidised EU exports from Asian markets.

- United States Of America:

  - From January 1995, global import quota of 657,000 tonnes, Australia allocated (378,000 tonnes).

  - Over quota duty rate of 31 per cent reducing to 27 per cent by 2000.

  - New quota of 20,000 tonnes allocated to both Argentina and Uruguay (access conditional on achieving FMD free status).

- European Union: To cut subsidised exports by 21 per cent and the amount of subsidy paid by 36 per cent compared to the average for 1986 - 1990.

- South Korea: Full tariffication in 2001, with a maximum tariff rate of 41.6 per cent. In the mean time, import quotas to be progressively increased from 106,000 tonne in 1994 to 225,000 tonne in 2000.

- Japan: To progressively reduce the current 50 per cent tariff to 38 per cent by 2000.

- Canada: The 20 per cent tariff replaced with a tariff quota; 72,000 duty free and an over quota tariff of 38 per cent.

It is assumed that key parties (notably the EU) will not seek to circumvent the constraint on subsidised exports (eg by decreasing internal price support and increasing use of GATT permitted compensation payments).

The situation for Korea is more problematic. Other GMI simulations have shown that meat demand in South Korea is likely to grow strongly. If announced quota levels are rigidly adhered to, internal beef prices will be greatly increased; for Korea, a negative outcome in its own right and a change in direct contradiction of a smooth transition to tariffication in 2001.

The optimistic view is that imports will exceed announced quotas in the years leading up to tariffication (so that by 2001, internal prices are more in line with the 46.8 per cent tariff to apply). The pessimistic view is that Korea will adhere to its quota levels but fail to "tariffy" (or genuinely "tariffy") in 2001.

Industry and other opinion varies on this issue. The demand Scenarios for Korea are included in this study as follows:

- Optimistic: Progressive implicit tariffication from 1996. Allow quota volumes to increase to the degree needed to maintain domestic beef prices on a trajectory toward equalling import price plus 46.8 per cent in 2001.

- Pessimistic. Quota as agreed but no tariffication in 2001 (continued growth of quota providing in line with earlier years)

Regional Bilateral Developments

A number of factors suggest further trade access gains in South East and North Asia. These include:

- The GATT Accession process for China (and subsequently Taiwan). China currently has an import duty of 70 per cent for beef and 30 per cent for cattle for feeding.

- Development and initiatives within the APEC forum.

- A continuation in trade liberalisation trends evident within the region over the last decade or more.

The Optimistic Scenario in the GMI assumes that import duties in "Other Asia" be cut by a third by the year 2005.

FMD Free Exports From South America

A recent study conducted for the MRC, *Analysis for increased competition in world beef markets*, made a detailed assessment of potential FMD free exports of beef from South American countries into Pacific Rim markets by the year 2015. That study included seven Scenarios on the volume and time profile of exports from these regions to Pacific Rim markets. The Scenarios differ according to whether entry into Pacific Rim markets is early or late and whether the volume of exports for each of early or late is low, medium or high.

The export volumes in each Scenario were arrived at by assessing:

- the effectiveness of veterinary controls in regions striving for FMD free status;

- the perception of the effectiveness of those programs by importing agencies in Pacific Rim countries; and

- likely acceptance by consumers of the new entrant's product.

In this study a scenario is included which is the Baseline Scenario plus the entry of FMD free exports from South America into the Pacific Rim. This scenario utilises Scenario 3 (early entry, high volume) from the South American Study. This assumes effective application of controls and a high level of acceptance in Pacific Rim countries. Export volumes to Pacific Rim import countries under this Scenario are shown in Table 2.4.

These exports are assumed to be distributed among Pacific Rim importing countries according to each country's current share of total Pacific Rim beef imports. They are assumed to receive a price discount of 20 per cent relative to the price received by Australian beef in these

markets to the year 2000. Thereafter the discount falls to 5 per cent as FMD free product from these countries becomes more acceptable to importers.

Table 2.4: POTENTIAL FMD FREE EXPORT VOLUMES TO PACIFIC RIM MARKETS FROM SOUTH AMERICAN COUNTRIES (kt pcw)

	1996	*1997*	*1998*	*1999*	*2000*	*2005*
Grass fed Argentina	0	20	30	35	50	85
Uruguay	30	55	70	80	90	110
Paraguay	0	0	0	0	0	25
Brazil	0	25	40	50	60	90
Total	**30**	**100**	**140**	**165**	**200**	**310**
Grain fed Argentina	0	0	0	20	30	80
Uruguay	0	0	25	30	40	80
Paraguay	0	0	0	0	0	20
Brazil	0	0	20	30	40	70
Total	**0**	**0**	**45**	**80**	**110**	**250**

Source: Southern American Study in Scenario 3 (early entry, high volume).

2.2 Competitive Supply

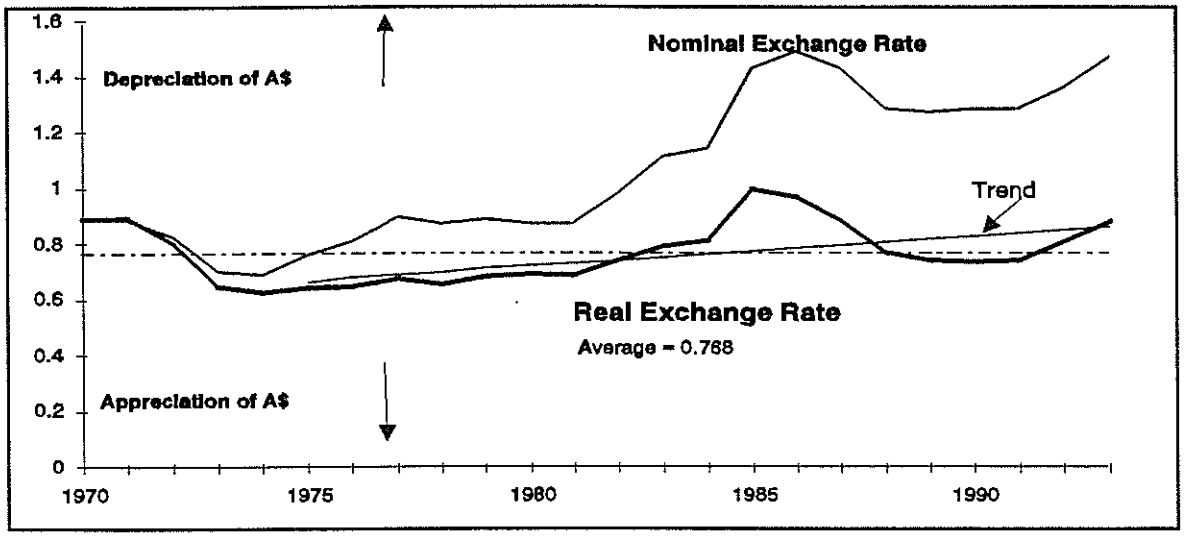
Within the GMI model, competitive supply is captured by way of a Relative Cost of Production Index. Implicitly, this is driven by changes in real exchange rates and by different rates of change in productivity growth and the price of non-traded inputs. For the purposes of this study the key country (with respect to both exchange rate and production competition) is the USA.

2.2.1 Real Exchange Rate: USA

The future pattern of *real* exchange rate between the A$ and the US$ is of vital importance to the Australian industry (ie nominal exchange rates adjusted for differences in rates of inflation). Changes in this rate directly affect returns the USA market (378,000 tonnes from 1995) and competition from our major competitor in our other principal export markets. Relative competitiveness is particularly important for the fed beef sector.

It is important to focus on real exchange rates. Increases in the value of the A$ as a consequence of lower inflation here than the US does not put the industry at a disadvantage (ie the exchange rate gain for the US industry is offset by the greater increase in costs).

Chart 2.1: REAL AND NOMINAL VALUES OF THE A$ AGAINST THE US$



Data Source: GMI Data Base

While there are many forecasts for a higher nominal A$ over the next one to two years, it is not always clear if this is expected on the basis of a stable real dollar (and differential inflation rates) or in consequence of a higher real rate. Overall, it would appear that a plausible case can be made for a higher than average real A$ over the remainder of the decade. Recent history (Chart 2.1) provides:

- Some comfort, the downward trend in the real value of the A$ since 1975. The real value of the A$ has fallen by around a cent per year, ie an average decline of 1.4 per cent per year.

- Some discomfort, the real rate in 1993 was nearly 15 per cent below its average value since 1970. It appears likely that the real A$ will increase in 1994 but still be below the average since 1970.

For the Baseline Scenario the real value of the $A is assumed to remain at its long run average value. The other scenarios are assumed to vary from this as follows:

- the Optimistic Scenario projects a continuation of the trend rate of depreciation (ie 1.4% per annum)

- the Pessimistic Scenarios projects a reversal of the trend rate of depreciation (ie a 1.4% per annum appreciation).

2.2.2 Sector Productivity Costs: USA

The Steering Committee believed that relative productivity change was likely to trend in favour of the Australian industry over the projection period. Factors thought likely to result in a higher rate of productivity improvement in Australia included:

- The lot feeding industry in Australia was less mature than in the USA, in terms of technology, skills, economies of scale etc. it was now in a position to "catch up" with USA efficiencies.

- Large new feedlots were state of the art facilities.

- The Australian abattoir sector had room for improvement and would achieve this under competition, whereas the USA plants were already at a high level of efficiency.

There was also the potential in Australia for greater efficiency of services from other key sectors of the economy (eg transport).

Against these factors it must be acknowledged that the USA has a strong ethos and track record in achieving efficiency gains. In addition, the lot feeding and abattoir sectors account for a little over a half of the value of export fed beef. It is not clear that the rate of efficiency gain in the farm sector will be any greater than "normal" over the projection period.

Determining relative rates of productivity improvement is of necessity arbitrary. However, it is felt that the following are reasonable quantifications of the Steering Committee's view on this matter:

- Baseline and Optimistic Scenarios: A relative rate of productivity improvement against the USA of one per cent per annum in the feedlot and processing sector, amounting to around 0.6 per cent per annum for the total production chain.

- Pessimistic Scenario: No relative gain (or loss) in productivity.

2.3 Commercial Factors

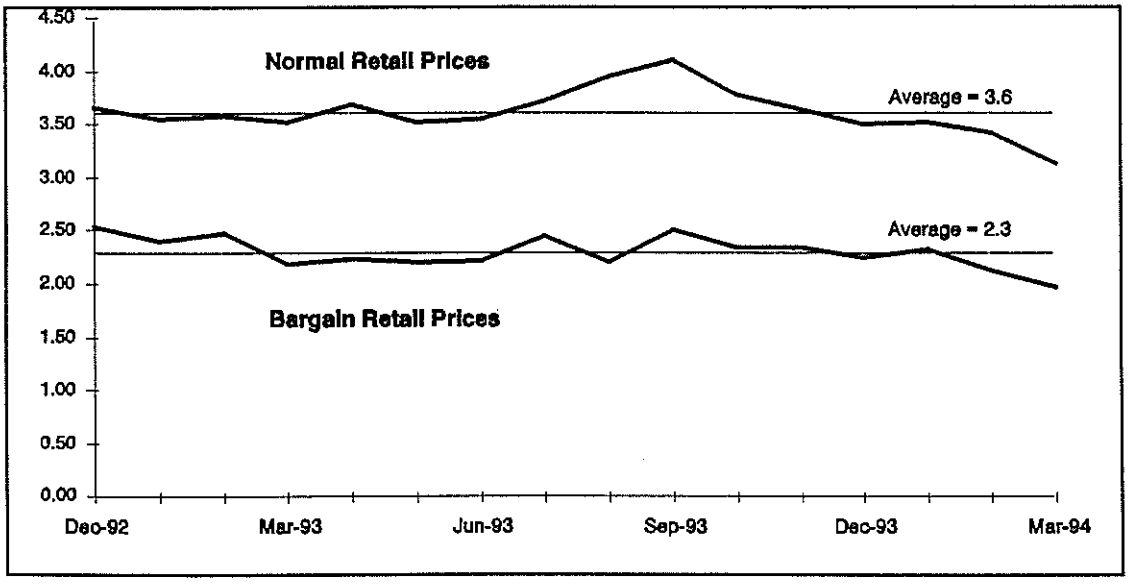
In addition to general economic and competitive issues, there are some "localised" commercial or related issues which would appear important to address in the modelling exercise.

2.3.1 Japanese Market Channel Reform

The distribution and retailing industries in Japan can be characterised as non-transparent, strongly regulated/administered and high cost. This results in higher prices to consumers and restricts consumption. The "marketing margin" between dock and consumer is illustrated in the Chart 2.2.

Chart 2.2: JAPAN:- RATIO OF RETAIL TO DUTY PAID C&F PRICE

(Fullset, Shortfed)



Data Source: AMLC.

The ratio of landed duty paid import prices to final retail price provides a broad measure of the impact of the market channel impediments. As illustrated the "normal" retail price is

around 3.6 times the importation price. In comparison, using the chilled grassfed fullset price as a base:

- Average retail prices for Sydney are around twice the FAS value of this product.

- Reported retail price in Singapore (1991 and 1992) was approximately twice the C&F value of this product.

It is not suggested that this is a precise comparison but it does give an order of magnitude relativity. The potential for significant reduction in this margin is instanced by the existing differential with "bargain" retail prices and the reported growth in discount meat shops.

Many factors are creating pressure for change in the distribution and retailing system within Japan (eg the recession, strong trade pressure from the USA) and there are indications of change in many areas. The key question for the beef market is whether reform in this sector will lead or lag the general rate of reform and whether the total margin reductions will be smaller or larger than the average for food products.

Initial indications from other research by the MRC and AMLC suggest that the proportion of Australian beef being sold at the "bargain" price is already much higher than that being sold at the "normal" price. Hence the degree of price reduction possible in this area may be more modest than it would first appear. In the life of this study, understanding of the potential gains from market channel reform will remain less than ideal but given available information it is assumed that there is no change from the current marketing margins.

2.3.2 Vertical Integration

A feature of the feed lot sector in Australia is its dependence on the Japan market and the degree of vertical integration with that market. Direct investment by Japanese firms in Australian lot feeding is considerable (in terms of the proportion of turnoff).

High levels of vertical integration can be expected to impact on trade flows, as:

- Sourcing into Japan can be expected to be increased and buffered by such investment, as:

  - Total company profit is maximised by directing its fed beef turnoff through the market chain it controls.

  - In the short run production investments are a "sunk cost". Hence, in periods when sourcing from Australia may appear less favourable on the basis of market prices, for the vertically integrated firm, the short run (marginal) cost of supply from tied (Australian) facilities will typically be lower than switching to alternate sources.

- Supply to emerging alternate markets may be constrained. Unless the vertically integrated firm has a strong presence in the alternate market:

  - It will not be able to capture profits along the market chain.

  - It will not have the same degree of marketing advantage (eg market knowledge and strength).

In its standard form, the model does not incorporate this factor (implicitly it assumes the economist's "perfect market"). For this study, a vertical integration factor is included in the model by introducing an import price differential (via a lower effective tariff on the Australian product) between Australian and US grainfed beef exports to Japan. The tariff differential is set at a rate sufficient to ensure that Australia's exports of grainfed beef to Japan through to the mid 1990s increase according to the product volume being targeted for the Japanese market by Japanese owned feedlots in Australia. A tariff preference in the Australian product relative to the US product of 10 per cent is needed to achieve this. The tariff preference is assumed to remain at this level until the year 2000 before declining gradually to reach zero by 2005.

The above discussion highlights the potential importance of vertically integrated investment by firms with strength in other emerging markets, particularly South Korea. These may modify outcomes from that predicted using a "perfect market" assumption. However, this is considered outside the scope of this study.

2.4 Agricultural Competition In Australia

Agricultural competition in Australia is of particular relevance to this study. More than 40 per cent of the total cattle turn off come from the Wheat/Sheep zone and the proportion of the actual/potential feeder cattle turn off would be even higher. Output of cattle from this region will be influenced by the returns from alternate enterprises, as well as those from beef.

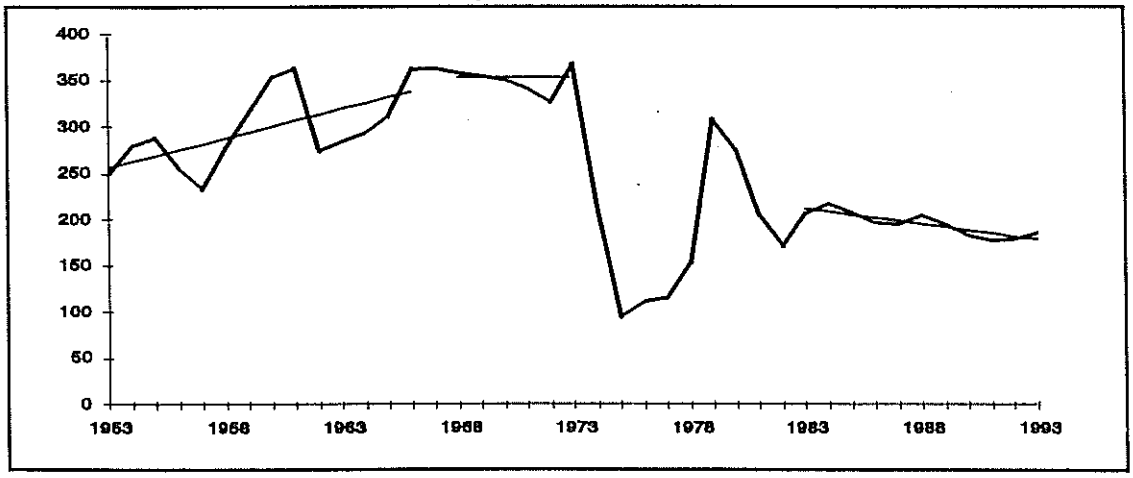
The price of competing commodities and their effect on beef supply are external to the GMI Model and in most simulations run to date have been presumed constant. For reasons outlined below, it is considered important to include these supply shift factors in the simulations run for this study. Beef prices have been relatively favourable (compared to wool and wheat) in recent years. However, this is more related to below trend prices for the alternate products (particularly wool) than it is to above trend prices for beef. The relative prices of alternate products may well change toward the end of the decade, at a time when demand could be expanded by increased access to South Korea.

2.4.1 Wool

Wool is the key competing commodity for beef cattle. History has shown its importance, for example, the surge in beef cattle numbers in the late 1960s and early 1970s being in part attributable to falling wool prices over that period. Charts 2.3 and 2.4 illustrate the changes in real prices for beef cattle and wool since 1953. Chart 2.4 illustrates the depth of the recent slump in wool prices. In 1993, real prices were around 30 percent below their (post 1975) trend level.

Chart 2.3: REAL FARM GATE PRICE BEEF CATTLE

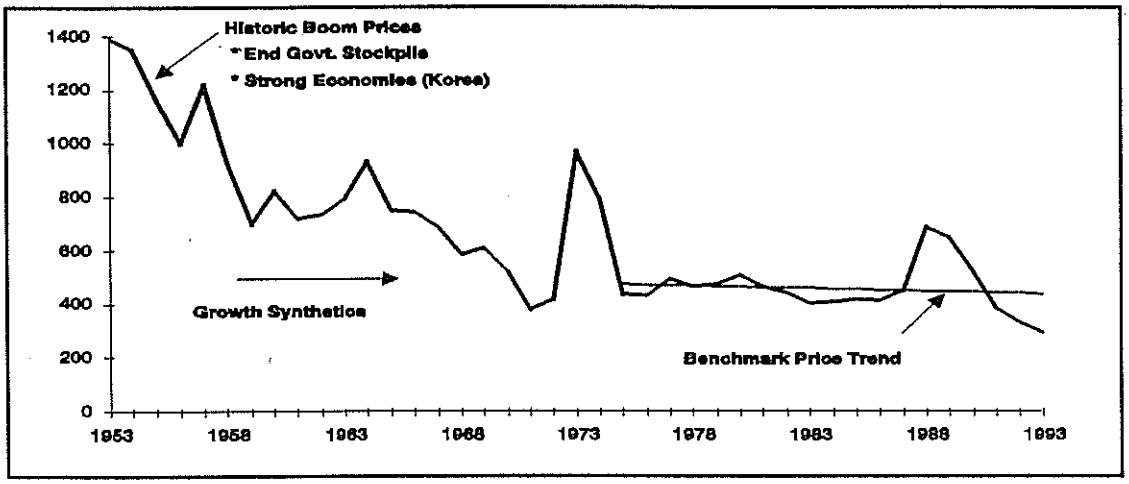
(1988 $s, C/kg est Dressed Weight)



Data Source: BAE to 1979 then GMI Data Base.

Chart 2.4: REAL FARM GATE PRICE WOOL

(1988 $s, C/Kg Greasy)



Data Source: BAE to 1979 then GMI Data Base.

Unlike, other agricultural products, wool has little direct benefit from the Uruguay Round Outcome. International trade in greasy wool is relatively free of trade barriers. International trade in processed wool and textiles is subject to constraints by way or the Multi Fibre Agreement. However, this was excluded from the Round and is being debated separately.

In fact recent trade access developments have probably been to the detriment of wool:

- The USA has imposed a "voluntary" quota on imports of non-silk textile products from China.

- China is reforming its tariff structure and imposing a higher tariff on wool (with a remittance for subsequent exporting). China is now the largest single market for Australian raw wool.

- Russia has imposed a 25 per cent tariff. Although this is relatively less important given the collapse in import demand following the breakdown of the former Soviet Union.

The key shift factors for wool prices are the strength of economic activity in key consuming countries (about two thirds of final consumption is attributable to the USA, Japan, Germany, UK, Italy and France) and the stock-pile over hang. It is anticipated that by 1996 all these major economies should have emerged from recession and be operating at higher levels of growth. This can be expected to feed through to higher wool demand later in the decade.

Following the "Garnaut Report" the stockpile is to be reduced by given annual amounts. If the policy is adhered to, the stockpile will have been virtually eliminated by the end of 1998/99. This corresponds with the time that international demand should be benefiting from buoyant economic conditions in the key consuming countries.

Under the fixed sell off plan, Australia's exports in 1998/99 would be nearly 20 per cent above production and stocks would be all but exhausted by the end of that year. The potential for a coincidence of a fall in availability from Australia and high international demand is real. While the trade will be aware of the movement in stocks, the potential for a price surge is clear.

While not drawing parallels, it is worth noting that a significant factor in the "Korean War Boom" in wool prices at the start of the 1950s was the exhaustion of the World War II wool stockpile (held jointly by Australia and Great Britain).

A scenario included in the study was the Baseline Scenario plus a surge in wool prices (25 per cent above trend) at the end of this decade.

3. FUTURE TOTAL AUSTRALIAN BEEF PRODUCTION AND SUPPLY TO MAJOR MARKETS

3.1 GMI Model Simulations

Future global beef market prospects, from base year 1994 to year 2005, are analysed through the use of the GMI Model which captures the global demand and supply features of the meat industry (including beef[2], pig meat, poultry, lamb, mutton and goat meat and seafoods). The output of the GMI model which is applicable to the purpose of this study is the total beef demand and supply in Australia, in other competing beef supplying countries and, in major country markets, particularly Japan and Korea.

Nine simulations, five key Scenarios and four sensitivity tests using the GMI model were completed. These were:

Scenarios:

- baseline;
- optimistic demand/competing supply;
- pessimistic demand/competing supply;
- baseline plus FMD free exports from South America;
- baseline plus high wool prices in the late 1990s;

Other Simulations/Sensitivity Tests:

- 25% decline in Japan's dairy beef productivity by 2005;
- 10% increase in US grainfed production;
- 10% decline in US grainfed production: and
- baseline plus improvement in Australia's grainfed productivity.

[2] The GMI model distinguishes at an aggregate level grainfed and grassfed beef but for the purpose of this study only the total Australian beef production output from the model was used. Disaggregation into various grainfed beef market segments by major country markets used the methodology described in Chapter 4.

3.2 Results

A summary of total beef demand and supply in Australia from each simulation is presented in the following tables and charts. A more detailed presentation of the GMI output is given in Volume 2, Module 2.

It is noted that the results are expressed as "production carcass weights" (pcw) which is the same as "carcase weight equivalent" (cwe) for total beef production figures shown in Tables 3.1 to 3.9. The distinction between pcw and cwe is important when considering particular market segments and to be consistent, pcw has been used throughout this report. A description of the difference between pcw and cwe is given in Section 4.2.

Table 3.1: BASELINE SCENARIO

		1994	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2005*
Australian beef production	(kt pcw)								
Exports		1141	1213	1247	1282	1313	1348	1380	1538
Domestic utilisation		677	677	680	683	687	690	694	712
Total		**1818**	**1890**	**1927**	**1965**	1999	**2038**	**2074**	**2249**
Japanese market	(kt pcw)								
Total imports		799	822	853	885	916	952	986	1079
Total consumption		1498	1524	1558	1595	1629	1667	1705	1814
Consumption per person	(kg pcw)	12	12	12	13	13	13	13	14
Composition of Australia's beef exports	(kt pcw)								
United States		405	427	428	430	430	430	429	411
Canada		76	103	102	102	101	101	100	99
Japan		470	490	505	522	532	550	566	607
South Korea		41	42	50	57	66	72	79	153
Taiwan		50	50	52	54	56	58	59	67
Other		100	101	109	118	127	138	147	201
Total		**1141**	**1213**	**1247**	**1282**	**1313**	**1348**	**1380**	**1538**
Present value of Australia's beef production	$m[1]								
Exports									24447
Production consumed on domestic market									12243
Total									**36690**

[1] Cumulative gross value for the period 1994-2005 expressed in 1994 dollars using a nominal discount rate of 10 per cent.

Table 3.2: OPTIMISTIC DEMAND/COMPETING SUPPLY SCENARIO

		1994	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2005*
Australian beef production	(kt pcw)								
Exports		1141	1223	1270	1319	1368	1422	1472	1656
Domestic utilisation		676	676	677	678	679	6809	682	698
Total		**1818**	**1899**	**1947**	**1997**	**2048**	**2102**	**2154**	**2354**
Japanese market	(kt pcw)								
Total imports		799	835	878	924	969	1017	1063	1241
Total consumption		1498	1539	1588	1640	1690	1744	1795	1997
Consumption per person	(kg pcw)	12	12	13	13	13	14	14	15
Composition of Australia's beef exports	(kt pcw)								
United States		405	426	427	426	422	419	414	398
Canada		76	102	101	100	98	97	96	93
Japan		470	498	520	545	567	591	612	684
South Korea		41	42	52	64	80	101	123	168
Taiwan		50	50	52	54	56	58	59	66
Other		100	104	117	130	145	157	168	247
Total		**1141**	**1223**	**1270**	**1319**	**1368**	**1422**	**1472**	**1656**
Present value of Australia's beef production	$m[1]								
Exports									26346
Production consumed on domestic market									12495
Total									**38841**

[1] Cumulative gross value for the period 1994-2005 expressed in 1994 dollars using a nominal discount rate of 10 per cent.

Table 3.3: PESSIMISTIC DEMAND/COMPETING SUPPLY SCENARIO

		1994	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2005*
Australian beef production	(kt pcw)								
Exports		1141	1199	1221	1241	1261	1282	1301	1358
Domestic utilisation		677	680	685	691	679	703	709	742
Total		**1818**	**1879**	**1906**	**1932**	**1958**	**1985**	**2009**	**2100**
Japanese market	(kt pcw)								
Total imports		799	811	830	851	872	894	917	947
Total consumption		1498	1512	1534	1557	1580	1605	1629	1670
Consumption per person	(kg pcw)	12	12	12	12	12	13	13	13
Composition of Australia's beef exports	(kt pcw)								
United States		405	422	419	417	413	409	404	381
Canada		76	102	101	100	99	98	97	95
Japan		470	482	490	499	507	516	524	508
South Korea		41	42	50	57	63	69	76	118
Taiwan		50	50	52	54	55	57	58	65
Other		100	100	108	116	124	133	142	192
Total		**1141**	**1199**	**1221**	**1241**	**1261**	**1282**	**1301**	**1358**
Present value of Australia's beef production	$m[1]								
Exports									23216
Production consumed on domestic market									12492
Total									**35708**

[1] Cumulative gross value for the period 1994-2005 expressed in 1994 dollars using a nominal discount rate of 10 per cent.

Table 3.4: BASELINE PLUS FMD FREE EXPORTS FROM SOUTH AMERICA SCENARIO

		1994	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2005*
Australian beef production	(kt pcw)								
Exports		1141	1213	1244	1272	1301	1331	1360	1490
Domestic utilisation		677	677	681	685	689	693	698	719
Total		**1818**	**1890**	**1925**	**1957**	**1991**	**2025**	**2058**	**2209**
Japanese market	(kt pcw)								
Total imports		799	822	857	900	941	1013	1064	1224
Total consumption		1498	1524	1563	1608	1652	1727	1781	1956
Consumption per person	(kg pcw)	12	12	12	13	13	14	14	15
Composition of Australia's beef exports	(kt pcw)								
United States		405	427	427	424	423	423	421	403
Canada		76	103	102	101	100	99	98	96
Japan		470	490	505	521	537	552	567	575
South Korea		41	42	50	55	61	65	70	155
Taiwan		50	50	52	54	55	56	58	64
Other		100	101	109	116	125	136	145	197
Total		**1141**	**1213**	**1244**	**1272**	**1301**	**1331**	**1360**	**1490**
Present value of Australia's beef production	$m[1]								
Exports									23862
Production consumed on domestic market									12164
Total									**36026**

[1] Cumulative gross value for the period 1994-2005 expressed in 1994 dollars using a nominal discount rate of 10 per cent.

Table 3.5: BASELINE PLUS HIGH WOOL PRICES IN THE LATE 1990s SCENARIO

		1994	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2005*
Australian beef production	(kt pcw)								
Exports		1141	1213	1247	1282	1315	1316	1348	1531
Domestic utilisation		677	677	680	683	687	687	691	712
Total		**1818**	**1890**	**1927**	**1965**	**2002**	**2003**	**2038**	**2242**
Japanese market	(kt pcw)								
Total imports		799	822	853	885	918	945	980	1072
Total consumption		1498	1524	1558	1595	1630	1661	1699	1808
Consumption per person	(kg pcw)	12	12	12	13	13	13	13	14
Composition of Australia's beef exports	(kt pcw)								
United States		405	427	428	430	430	415	414	413
Canada		76	103	102	102	101	98	98	99
Japan		470	490	505	522	538	544	560	588
South Korea		41	42	50	57	64	69	75	163
Taiwan		50	50	52	54	56	57	59	67
Other		100	101	109	118	127	133	142	202
Total		**1141**	**1213**	**1247**	**1282**	**1315**	**1316**	**1348**	**1531**
Present value of Australia's beef production	$m[1]								
Exports									24311
Production consumed on domestic market									12273
Total									**36584**

[1] Cumulative gross value for the period 1994-2005 expressed in 1994 dollars using a nominal discount rate of 10 per cent.

Table 3.6: BASELINE PLUS 25 PERCENT DECLINE IN JAPANESE DAIRY BEEF PRODUCTION BY 2005

		1994	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2005*
Australian beef production	(kt pcw)								
Exports		1141	1217	1255	1294	1333	1373	1410	1580
Domestic utilisation		677	676	679	681	684	686	689	704
Total		**1818**	**1893**	**1933**	**1975**	**2015**	**2059**	**2099**	**2284**
Japanese market	(kt pcw)	799	834	878	925	973	1026	1078	1245
Total imports		1498	1527	1565	1607	1649	1694	1741	1886
Total consumption		12	12	12	13	13	13	13	14
Consumption per person	(kg pcw)								
Composition of Australia's beef exports	(kt pcw)								
United States		405	424	422	420	416	413	408	380
Canada		76	102	101	100	99	98	97	94
Japan		470	499	523	550	489	605	633	706
South Korea		41	42	50	56	63	68	75	152
Taiwan		50	50	52	54	55	57	58	65
Other		100	100	107	115	123	132	139	184
Total		**1141**	**1217**	**1255**	**1294**	**1333**	**1373**	**1410**	**1580**
Present value of Australia's beef production	$m[1]								
Exports									25154
Production consumed on domestic market									12362
Total									**37516**

[1] Cumulative gross value for the period 1994-2005 expressed in 1994 dollars using a nominal discount rate of 10 per cent.

Table 3.7: BASELINE PLUS 10 PERCENT INCREASE IN US GRAINFED PRODUCTION

		1994	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2005*
Australian beef production	(kt pcw)	1141	1155	1189	1223	1256	1291	1323	1474
Exports		677	686	689	692	696	699	703	720
Domestic utilisation		**1818**	**1842**	**1878**	**1915**	**1951**	**1990**	**2025**	**2194**
Total									
Japanese market									
Total imports	(kt pcw)	799	923	957	991	1027	1065	1102	1188
Total consumption		1498	1614	1651	1690	1729	1769	1810	1913
Consumption per person	(kg pcw)	12	13	13	14	14	14	14	15
Composition of Australia's beef exports	(kt pcw)								
United States		405	368	369	370	369	369	368	353
Canada		76	102	101	101	100	100	99	98
Japan		470	487	502	519	534	551	567	580
South Korea		41	37	45	51	58	63	70	159
Taiwan		50	51	53	55	57	59	60	68
Other		100	110	118	128	138	149	159	216
Total		**1141**	**1156**	**1189**	**1223**	**1256**	**1291**	**1323**	**1474**
Present value of Australia's beef production	$m[1]								
Exports									22491
Production consumed on domestic market									11243
Total									**34476**

[1] Cumulative gross value for the period 1994-2005 expressed in 1994 dollars using a nominal discount rate of 10 per cent.

Table 3.8: BASELINE PLUS 10 PERCENT DECLINE IN US GRAINFED PRODUCTION

		1994	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2005*
Australian beef production	(kt pcw)								
Exports		1141	1278	1313	1348	1382	1418	1450	1594
Domestic utilisation		677	667	670	673	677	680	684	703
Total		1818	1945	1982	2021	2058	2098	2134	2297
Japanese market	(kt pcw)								
Total imports		799	729	757	786	817	850	881	964
Total consumption		1498	1442	1473	1508	1541	1577	1612	1711
Consumption per person	(kg pcw)	12	11	11	12	12	12	12	13
Composition of Australia's beef exports	(kt pcw)								
United States		405	495	496	499	499	500	499	482
Canada		76	104	103	103	102	102	101	100
Japan		470	490	505	522	537	556	573	595
South Korea		41	48	57	65	73	79	86	166
Taiwan		50	49	51	53	55	57	58	66
Other		100	92	99	107	115	126	134	186
Total		1141	1678	1313	1348	1382	1418	1450	1594
Present value of Australia's beef production	$m[1]								
Exports									26743
Production consumed on domestic market									12542
Total									39285

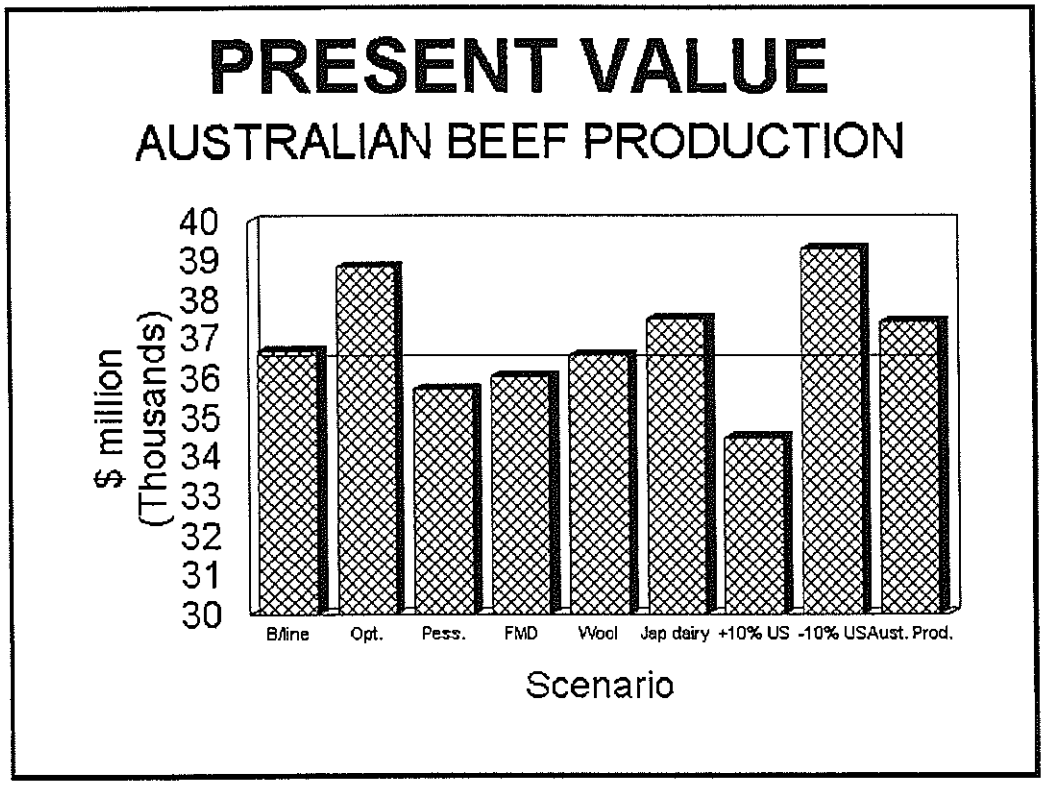
[1] Cumulative gross value for the period 1994-2005 expressed in 1994 dollars using a nominal discount rate of 10 per cent.

Table 3.9: BASELINE PLUS GRAINFED PRODUCTIVITY IMPROVEMENT IN AUSTRALIA

		1994	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2005*
Australian beef production	(kt pcw)								
Exports		1141	1225	1272	1320	1367	1417	1473	1621
Domestic utilisation		677	677	680	683	687	690	694	713
Total		1818	1902	1952	2003	2054	2107	2167	2334
Japanese market	(kt pcw)								
Total imports		799	827	863	901	938	979	1022	1100
Total consumption		1498	1529	1568	1609	1650	1693	1739	1833
Consumption per person	(kg pcw)	12	12	12	13	13	13	14	14
Composition of Australia's beef exports	(kt pcw)								
United States		405	427	428	430	430	430	428	412
Canada		76	103	102	102	101	101	100	99
Japan		470	501	527	555	582	612	649	657
South Korea		41	44	53	61	70	78	88	182
Taiwan		50	51	52	54	56	58	60	67
Other		100	99	110	118	128	138	148	204
Total		1141	1225	1272	1320	1367	1417	1473	1621
Present value of Australia's beef production	$m[1]								
Exports									27475
Production consumed on domestic market									12229
Total									37408

[1] Cumulative gross value for the period 1994-2005 expressed in 1994 dollars using a nominal discount rate of 10 per cent.

Chart 3.1



Source: GMI Model.

4. 1994 AUSTRALIAN BEEF MARKET SEGMENTATION AND CATTLE NUMBER DEMAND

Here the total Australian beef output has been disaggregated into beef market segments for the 1994 base year. Ten market segments were considered:

Export

- Grainfed, Japanese B3 - fed for 230 days or more
- Grainfed, Japanese B2 - fed for 150 days
- Grainfed, Japanese B1 - fed for 100 days
- Grainfed, Japanese grainfed yearling - fed for 100 days
- Grainfed, Korea K1 - fed for 100 days
- Grainfed, Korean Fullsets - B1 equivalent feeding
- Grassfed

Domestic

- Grainfed, 70 days of more
- Grainfed, supplemented at pasture in opportunistic feedlots
- Grassfed

Beef output by market segment was transformed into the number of feeder, or slaughter, cattle required for the 1994 base year. Future possible shifts in the grainfed beef market segments are identified.

4.1 Approach

The starting point for disaggregation of overall Australian beef production by market destination for the base year of 1994 was the AMLC published beef industry statistics available in June, 1994. The key data used were total number slaughtered (8.244 million head), total shipped weight (768 kt), shipped weight to Japan and to Korea of grainfed beef (112.6 and 14.7 kt respectively), carcase weight equivalent of total Australian production (1818 kt) and carcase weight equivalent

of total beef export and domestic disappearance (1141 and 677 kt respectively). Since June, 1994, when this study started, the AMLC numbers have been revised slightly for 1994 but for this study the June, 1994 numbers are assumed to represent the base year.

The availability of data by market segment in Japan is limited to pricing data published by LIPC according to grade and wholesale. The JMGA (Japanese Meat Grading Association) publishes information with respect to the numbers of carcases graded including the numbers that fall within the various grades. This information has made it possible, along with the LIPC data to establish the current three main market groupings ie Wagyu (top end market), the Middle Market and the manufacturing market. Further Japanese disaggregation was based on retail information from the ASI-Intech survey, in conjunction with Japanese meat company projections. To validate Australian grainfed export to the Japanese market, we have used feedlot production data in the absence of detailed export statistics.

The Korean beef consumption data is derived from the still regulated import tender system which will remain in place until year 2001. What will happen beyond year 2001 is speculation.

Data on domestic grainfed cattle production is very scant. We have disaggregated domestic grainfed production into two categories, >70 days and grain supplemented. Total domestic grainfed production is derived from numbers of grainfed cattle slaughtered by major retailers and factored up by their estimated market share vis-a-vis the butchers. The >70 day domestic grainfed is assumed to equal the throughput of major feedlots servicing the domestic grainfed market and the residual assumed to be grain supplemented. These are obviously soft numbers but essential to an estimation of Australia's resource input into grainfed cattle production. There is no actual information available as to how much grainfed beef is being retailed domestically, likewise there is no way of establishing preferences or trends for various grades or specifications on the domestic market.

4.2 1994 Export (Shipped) Beef Conversion to Cattle Requirements

The conversion of shipped weights by market segment to actual cattle numbers involves several steps as follows:

Step 1 total grainfed shipped weight disaggregated by market segment;

Step 2 shipped weight by market segment converted to "production carcase weight" (pcw);

Step 3 Pcw by market segment converted to number slaughtered;

Step 4 number of cattle slaughtered by market segment converted to number of feedlot entry cattle;

Step 5 derivation of residual grassfed export by reconciliation with total shipped weight (grass & grainfed), total number Australian cattle slaughtered, total Australian pcw exported.

It is noteworthy that the transformation starts with *shipped weight*, a statistic which can be obtained with some reliability and that we focus on grainfed shipped beef. Grassfed is treated as the residual and reconciled with the total Australian export statistics as collected by AMLC. Also we have used the term "production carcase weight" (pcw) rather than "carcase weight equivalent (cwe) to express the carcase weight of animals slaughtered. (see Note)

Production Carcase Weight (pcw)

'Production carcase weight, (pcw) is used to express the carcase weight of slaughtered animals throughout this report rather that 'carcase weight equivalent' (cwe). Pcw is the carcase weight of slaughtered animals required to supply the shipped weight of a particular market segment PLUS trim which would be diverted to another market.

The traditional methodology is to assume that boned out shipped weight is 67% of carcase weight. Thus shipped weight is divided by 0.67 to convert to carcase weight (cwe) and this carcase weight is divided by the relevant average carcase weight to estimate the number of animals slaughtered. The study has identified that this results in a substantial underestimation of animals grainfed for export (with an offsetting increase in the recorded grassfed exports). The number of animals estimated by this cwe methodology cannot be reconciled with industry production information (eg specification of number of animals on feed).

For example, the shipped weight of grainfed beef into Japan in 1994 was 112.6 kt. It is estimated that the carcases used to produce this 112.6 kt would produce another 50.7 kt of trim. The real carcase weight (ie pcw) required to produce the recorded 112.6 kt shipped to Japan is (112.6 + 50.7)/ 0.67 = 243 kt. In comparison the traditional methodology would estimate the carcase weight at 112.6/0.67 = 168 kt. Using the revised methodology results in a 45 percent increase in the estimated number of animals fed for Japan in 1994.

Step 1: Total Grainfed Shipped Weight Disaggregated by Market Segment

From ASI-INTECH retail survey in Japan and Australian industry interviews we know the Australian share of the middle market in Japan is approximately 70 percent grainfed and 30 percent grassfed. The grainfed component disaggregated as follows:

	Market Segment	Share
-	B3 Grainfed	18.0%
-	B2 Grainfed	37.0%
-	B1 Grainfed	34.0%
-	Yearling Grainfed	11.0%
-	**Total**	**100.0%**

From AMLC data, total grainfed beef exports to Japan in 1994 was expected to be 112.6 kt which, when apportioned according to the above market share, provides the shipped weights by market segment as follows:

	Market Segment	Shipped Weight (kt)
-	B3 Grainfed	22.2
-	B2 Grainfed	42.1
-	B1 Grainfed	35.4
-	Yearling Grainfed	12.8
-	**Total**	**112.6**

The Korean market disaggregation between quarter beef and fullsets is derived directly from AMLC data. Quarter beef export was expected to amount to 14.0 kt and fullsets 1.7 kt for 1994.

Step 2 Shipped Weight by Market Segment converted to "Production Carcase Weight"

Shipped yield by market segment was derived from interview with leading feedlotters and processors. This varies between 42 and 50 percent for grainfed cattle into Japan depending upon the carcase fabrication procedures. These data are not readily available and could change in the future as meat fabrication practices change. It is significant that for the higher valued B2/B3 type carcase, changes to the fabrication has resulted higher yields of 47 to 50 percent compared to the old 42 percent fullset yield. Shipped weight divided by the shipped yield provides the pcw by market segment. Trim weight is the difference between the nominal carcase weight based on a yield of 67 percent and the pcw. Table 4.1 refers.

Table 4.1 GRAINFED SHIPPED WEIGHT TO PRODUCTION CARCASE WEIGHT

Specification	Shipped Weight (kt)	Shipped Yield (%cw)	Production Carcase Weight (kt)	Trim (kt)
Japan B3	22.2	50%	44.5	7.6
Japan B2	42.1	47%	89.6	17.9
Japan B1	35.4	43%	82.4	19.8
Japan Yearling	12.8	47%	27.2	5.4
Total Japan	112.6	46%	243.7	50.7
Korean Quarter Beef	14.0	100%	14.0	
Korean Fullsets	0.7	42%	1.7	0.4
TOTAL	**127.3**	49%	259.4	**51.1**

Step 3: Production Carcase Weight by Market Segment converted to Slaughter Cattle Number

Average unit carcase weight for animals slaughtered for each market segment were derived from interview with processors and feedlotters. The conversion of pcw to slaughter numbers for export grainfed cattle is shown in Table 4.2

Table 4.2 PRODUCTION CARCASE WEIGHT OF EXPORT GRAINFED CATTLE CONVERTED TO SLAUGHTER CATTLE NUMBERS

Specification	Average Carcase Weight (kg)	Production Carcase Weight (kt)	Number Slaughter Cattle Required ('000)
Japan B3	400	44.5	111
Japan B2	350	89.6	256
Japan B1	330	82.4	250
Japan Yearling	250	27.2	109
Sub-Total Japan		**243.7**	**726**
Korean Quarter Beef	280	14.0	50
Korean Fullsets	280	1.7	6
Total Export Grainfed		**259.4**	**782**

Step 4 Number of Export Grainfed Cattle Slaughtered Converted to Feedlot Entry Cattle Number

The number of feeder cattle required has been derived from slaughter numbers after factoring in:

i) the likely downgradings (particularly important for the B3/B2 production);

ii) the anticipated feedlot mortality;

iii) the likely ratio of steers to heifers by specification.

Table 4.3 shows the conversion of grainfed slaughter cattle to feedlot entry cattle.

Downgradings

For the purposes of these calculations it has been assumed that for:

i) B3 Production the downgradings will be 55 percent. Although we expect the downgrading to reduce after 1998, for our cattle number transformation we have maintained a constant 55 percent downgrading. Our expectation is that from 1998 to 2000 they will drop to 50 percent and from 2001 until 2005 the B3 downgradings will be at 45 percent.

ii) B2 Production the downgradings will be 35 percent until 1997. Our expectation is that from 1998 to 2000 they will drop to 25 percent and from 2001 - 2005 they will be 20 percent.

Mortalities

The feedlot mortality rates have been calculated as 1.0 percent for all categories.

Ratio of Steers to Heifers

Although it is to be hoped that Australia will be able to export heifer beef to Japan in the grainfed yearling specification, no heifers have been included for these calculations for any of the Japanese specifications.

A ratio of 40 percent heifers has been used in calculating the Korean requirement of feeder cattle for both specifications.

Table 4.3: CONVERSION CATTLE SLAUGHTER NUMBERS TO FEEDLOT ENTRY NUMBERS ('000 head)

Specification	Steers into abattoir	Heifers into abattoir	Steer loss from down-grading	Steer gain from down-grading	Cattle into feedlot net of down-grading & mortality
Japan B3	111		61		174
Japan B2	256		90	61	287
Japan B1	250			90	162
Japan Yearling	109				110
Total Japan	726				733
Korean quarter	30	20			50
Korean fullset	4	2			6
Total grainfed export	**760**	**22**	**151**	**151**	**789**

Step 5:Derivation of Residual Grassfed Export

The total cattle slaughtered for dedicated grassfed export is derived from the grassfed shipped weight which is, in turn, derived from the total shipped weight less grainfed shipped weight less grainfed trim which is assumed to be totally exported as grassfed beef. From Table 4.5, the following calculation applies:

Total beef shipped from Australia	(+) 768.0 kt
less grainfed shipped weight	(-) 127.3 kt
less grainfed trim	(-) 51.1 kt
Shipped weight of dedicated grassfed export (A)	(=) 589.6 kt
pcw of beef export total	(+) 1140.9 kt
less pcw grainfed export	(-) 259.4 kt
pcw of dedicated grassfed export (B)	(=) 881.5 kt
shipped yield of grassfed export (A/B)	67%

From the above calculation the shipped yield of grassfed export is the rounding figure and is lower than we would expect as much of the grassfed export goes as quarter beef suggesting that the average shipped yield should be between 67 and 100 percent. This may suggest that all the grainfed trim may not be exported. However where the trim disappears in the meat market is not critical to this research and has not been rigorously investigated.

4.3 1994 Domestic Beef Disappearance Converted to Cattle Numbers

Within the domestic grainfed market there are two main specifications to consider:

(i) grainfed > 70 days, which are fed in major, or formal sector, feedlots; and

(ii) grainfed supplemented which is that product fed in the opportunistic feedlots or supplemented at pasture. [3]

The later is a much larger segment than was originally believed. Because this market competes for resources (grain and cattle), an appreciation of the size of domestic grainfed market is important to the objective of this study. From discussions with the national beef retail managers of Woolworths and Coles, discussions with a major Sydney retailer, from the Nielsen Survey, LMAQ and NSW saleyard reports we believe the total number of domestic grainfed cattle is in the order of 1.2 million head of which 390,000 head are fed for more than 70 days in major feedlots and the residual of 811,000 head grain supplemented. These data are supported by the estimated grainfed beef sold through the major supermarkets in Australia as shown in Table 4.4 At present the supermarkets hold about 42 percent of the domestic beef market but definition of grainfed is not precise.

[3] This is a complex group which comprises permanent small feedlots with less than 100 head capacity, seasonally and intermittently used feedlots and, pasture supplemented grain feeding systems, often applied on farms which produce their own grain. Virtually no information is available on the breakdown of this group. For estimation of feedlot capacity we have assumed 50% are small permanent feedlots.

Table 4.4 PERCENTAGE OF GRAINFED BEEF SOLD BY SUPERMARKET BY STATE ON DOMESTIC MARKET

STATE	Chain A	Chain B
Queensland	100	100
New South Wales	50	50
Victoria	30	25
South Australia	50	12
Western Australia	40	12
Tasmania	10	0

4.4 Results of 1994 Market Disaggregation and Cattle Number Conversion

A summary of the result of the 1994 market disaggregation and cattle number transformation are shown in Table 4.5

4.5 Possible Future Shifts between Grainfed Markets

The market mix of export grainfed beef and the share of grainfed beef on the domestic market is expected to change by the year 2000. Possible future shifts in market mix are discussed in this section.

4.5.1 Japanese B3

Since 1989 (liberalisation) in Japan the number of dairy steers achieving the B3 grade has dropped from 563,100 or 44 percent of the number graded (1.27 million) to 358,500 or 37 percent of the number graded (969,000). Based on LIPC statistics, during that time the average wholesale carcase price for B3 dairy steer has dropped from 1,250 Yen/kg to 950 Yen/kg, under pressure from imports and concurrently the cost of production has increased. By the year 2000 the wholesale price for B3's in expected to drop another 20 percent and be at 750 Yen/kg. Over the corresponding period, costs of production will increase even further making the B3 an unlikely target for Japanese feeders of dairy steer. As a consequence, more dairy farmers are using Wagyu semen and embryos in the cows from which they don't wish to breed replacement milk cows (Holsteins) taking them into the top, higher value market and away from the B3 market.

Table 4.5 1994 BEEF PRODUCTION DISAGGREGATION BY MARKET AND REQUIRED CATTLE INPUT

MARKET	AUSTRALIAN BEEF PRODUCTION							REQUIRED CATTLE NUMBERS									
	Unit Carcase Wgt	Carcase Weight			Shipped Yield	Shipped Weight	Trim into other export markets	1994 Total Slaughter		Steers		Steers down graded		Increase from down grading	Feedlot Mortality	Heifers into feedlot	Steers into feedlot net of down grading	Total Cattle
	(kg)	(kt) \1	%	%	(% cw)\3	(kt)	(kt)\5	('000 hd)	%	%	'000 hd	%	'000 hd	'000 hd	(%)	'000 hd	'000 hd	'000 hd
GRAINFED																		
EXPORT GRAINFED																		
Japan B3	400	44.5	9%		50%	22.2	7.6	111	6%	100%	111	55%	61		1.0%		174	174
Japan B2	350	89.6	18%		47%	42.1	17.9	256	13%	100%	256	35%	90	61	1.0%		287	287
Japan B1	330	82.4	16%		43%	35.4	19.8	250	13%	100%	250			90	1.0%		162	162
Japan yearling	250	27.2	5%		47%	12.8	5.4	109	5%	100%	109				1.0%		110	110
Japanese sub total		243.7				112.6	50.7											733
Korean quarter beef	280	14.0	3%		100%	14.0		50	3%	60%	30				1.0%	20	30	50
Korean fullsets	280	1.7	0%		42%	0.7	0.4	6	0%	60%	4				1.0%	2	4	6
Total Export Grainfed		259.4	51%			127.3		782	39%							22	767	789
Trim sub total							51.1											
DOMESTIC GRAINFED																		
70 day minimum 4/								390										394
Grain supplemented								811										819
Total Domestic Grainfed	210	252.2	49%					1,201	61%	50%	601				1.0%	607	607	1213
Total Grainfed		511.6	100%	28%				1,983	100%							629	1,374	2,002
GRASSFED																		
a. Export	229	881.5			67%	589.6		3,842										3,842
b. Trim exported						51.1	51.1											
Export subtotal(incl. trim)						640.7												
Domestic subtotal	176	425.0						2,419										2,419
Total Grassfed		1306.5		72%				6,261										6,261
TOTAL GRAIN & GRASS FED 2/	221	1818.0		100%		768.0		8,244										8,263
Export Sub Total 2/		1140.9		63%														
Domestic Sub Total 2/		677.2		37%														

Assumptions:
\1 In the case of grainfed exports refers to the carcase weight of animals slaughtered to provide shipped weight plus trim.
\2 Total production from AMLC May 1994 estimates
\3 Shipped yield represents the % of the carcase going to the respective markets
\4 ALFA estimates that 30% of cattle on feed in their surveys are being fed for a 70-day domestic market. In addition there is a large number of grain supplemented cattle which go into the domestic market.
\5 51.1 kt grainfed trim is exported as grassfed.

On the other hand the USA is unlikely to target this market in the future. The Americans are driven by their domestic market, they still only export about 8 - 9 percent of total production. The major problem confronting the US domestic market is declining consumption which has been blamed on price in relation to pork and chicken and the excessive fats in red meat, an argument fuelled by the human nutrition debate. To counteract both these negatives the US is focussed on reducing age at slaughter (maintain inherent tenderness with little or no marbling) and reducing the amount of excess fat. As a result, it will be almost impossible for the US to produce any significant quantities of B3 type beef. Optimum marbling is achieved between 24 - 28 months in most breeds of beef cattle, one reason the Japanese slaughter their dairy steers at 22 - 26 months and their Wagyus at 30 months. If the Americans reduce their age of slaughter by another two months (from 17 - 18 months to 15 - 16 months) it simply means the task of them achieving any marble score 3 product is highly unlikely .

This move in Japan and USA leaves a gap at the top end of the middle market, that is the B3, which could be exploited by Australia. However to take full advantage of the niche that appears to be developing in the B3 market, Australian producers will have to reduce the percentage downgraded from those cattle currently targeting the B3 specification by improving both marbling and saleable yield. It is no longer good enough to have 45 - 50 percent of those cattle targeting the B3 specification and put on feed for 250 days only to achieve a grossly over fat B2.

4.5.2 Japanese B2

In Japan since 1989, the percentage of B2's graded has increased from 49 percent to 58 percent. In actual numbers of B2's that represents a decrease from 637,000 to 562,000. The B2 is becoming the "stock standard" product of the middle market. The price per kilogram carcase weight at wholesale has dropped from 1,000 Yen to 750 Yen.

The middle market as defined by McKinsey will continue to occupy about 75 percent of the total Japanese market through until year 2000. The B2 currently comprises some 50 percent of the middle market (estimate based on gradings and retail information) and by the year 2000 will probably increase to 55 percent of that share.

Due to rising costs of production it is likely a higher proportion of the declining Japanese dairy steer production will be B2. This coupled with a vigorous export push from the USA of younger, and therefore less marbled product, will make the B2 segment very competitive. Australia will have to improve current efficiencies of production to maintain and improve share of the B2 segment. Australia's competitive position as a supplier into this market segment will depend on the streamlining of the Queensland B2 production system utilising cheap tracts of land to breed and background calves

on endowed country enabling them to reach 24 - 28 months at slaughter. This will enhance marbling considerably. In addition the downgradings on marbling will need to be reduced. A goal of reducing downgrades from 35 percent to 15 percent and reducing the days-on-feed from 150 to 120 days by year 2000 will help to keep Australia price competitive in this market segment.

4.5.3 Japanese B1/Grainfed Yearling

It is likely that the current B1 grainfed market segment will decline in Japan and the grainfed yearling increase. The reasons for increased popularity of the grainfed yearling are the emphasis on tenderness, the younger and health conscious consumers wanting leaner beef and yearling beef making it more attractive for retailers wishing to promote sales of steaks in 150 - 200 gm portions; the steaks cut from the primals of the heavier carcases being too large. On the other hand, the current B1 grainfed specification is expected to decline in Japan because the B1 is normally fed 100 - 120 days and does not achieve adequate marbling to achieve the 20 percent price premium paid at wholesale for B2's, making the economics of grainfed B1 marginal.

Competition in the grainfed yearling market segment will also be fierce. The major competitor in this market will be US select beef produced from the higher yielding younger, faster growing, more efficient cattle with the youthfulness to essentially satisfy tenderness requirements. Other products vying for this market include some Japanese dairy steer, Australian yearling grassfed and Australian high quality pasture fed. It is likely that Australia will supply more grainfed yearling into this segment and this will replace a proportion of the pasture fed older cattle currently supplied by Australia into this market segment. Efforts need directing toward gaining acceptance of heifers in the Japanese grainfed market.

4.5.4 Korea

The product mix into Korea will definitely change. Past the year 2001, it is highly unlikely that any grainfed quarter beef will be supplied. A change of product preference to either chilled and/or frozen primals will depend on the development within South Korea of an infrastructure/distribution system through to retail to handle large volumes of chilled/frozen primals.

The grainfed product mix in Korea is expected to comprise B1 type product, B2 type product and grainfed yearling past 2001. The Korean grainfed market is expected to follow a similar pathway during its development to that of the Japanese market. However, there won't be the same emphasis on B3 type product. The stock standard product will most likely be the grainfed yearling with the B2 representing the quality product. Imported beef will be competing with domestically procured

Hanwoo cattle in this segment. The fact that B2 is common to both Japan and Korea will be a negotiating plus from the Australian industry's perspective.

In the interim period, B1 type grainfed will be supplied through the SBS system. This will provide a home for the downgrades from the B2 production for Japan and so provide an outlet for that product while progress in the areas of genetics and production system modifications is implemented.

The fact that the B2 specification is expected to become the stock standard product in both Japan and Korea will be of benefit to Australia as a supplying nation as it will promote the valued element of competition. The B2 for Korea may have a slightly lighter carcase weight than the Japan B2. This will depend on outcomes of research into primal cut size needs for Korean cuisine.

4.5.5 Australian Domestic Grainfed

Two future developments are expected to occur on the Australian domestic beef market. Firstly, the volume of grainfed beef will increase and the volume of grassfed will corresponding decline. Secondly, the average carcase weight will increase.

A push from the supermarket chains, which currently command 42 percent of the domestic market, to increase grainfed supply will be major factor influencing this shift. Already in Queensland 100 percent of the Queensland's domestic market serviced by the supermarkets is grainfed (see Table 4.4) and the objective is to emulate this as far as possible in the southern states. This push from the supermarkets is partly because a grain feeding base will enable the beef industry to supply consistent quality product year round. The argument should not be that grain feeding is better than pasture feeding or that it produces a better product; the fact is it provides an in-built safety valve, in the form of consistency of quality and regularity of supply. It is also a considered opinion that an increased grainfeeding base is going to be an essential element in the fight to arrest declining domestic beef consumption. The introduction of ALFA's tender choice and gourmet choice product will see the introduction of marbling, albeit at reasonably low levels, into the grainfed specification for the domestic market. Significantly the marbling levels will correlate to a total lipid content in the range of 3 - 9 percent. The fact that the fat content is maintained at below 10 percent will ensure the product is still eligible for the National Heart Foundation tick.

Within the domestic grainfed specification an increase in carcase weight is also expected to occur. This will primarily occur because of increased efficiency in the processing and production sub-sectors and because of the major supermarkets push for increase slaughter weights.

The advent of grading and boxed beef expansion are two possible future developments that will further improve the position of grainfed beef domestically. Grading will enable the grainfed beef to be labelled into categories of consumer acceptance eg. the ALFA tender choice and gourmet choice. Grading is expected to give beef a boost by guaranteeing a consistent product year round.
Boxed beef will ensure tenderness can be further enhanced and guaranteed. The ageing process generally promotes tenderness and a minimum of 14 days ageing will (given the inventory/ infrastructure can be funded) provide consumers with additional guarantees as to eating quality of beef.

4.5.6 Future Market Shift Summary

Expected future shifts in the grainfed market segments for Australian beef are summarised in Table 4.6.

Table 4.6 EXPECTED RELATIVE SHIFTS IN MARKET SEGMENTS SUPPLIED BY AUSTRALIA

Existing Market Segment	By year 2000		By year 2005	
	Expected segment change	Complementary segment change	Expected segment change	Complementary segment change
Japanese B3	increase slightly	decrease B2	steady	nil
Japanese B2	increase	decrease B1	steady	nil
Japanese B1	decrease	increase B2 & grainfed yearling	steady	nil
Japanese grainfed yearling	increase	decrease B1 & grassfed yearling	steady	nil
Korean K1	steady	nil	decrease	increase Korean grainfed yearling
Korean fullsets	steady	nil	decrease	increase Korean "B2"
Domestic >70 day grainfed	increase	decrease domestic grassfed	steady	nil
Domestic grain supplemented	increase	decrease domestic grassfed	steady	nil

The effect of these market shifts on the Baseline Scenario was sensitivity tested (see chapter 5). For the sensitivity test, we have assumed:

Japanese B3	10% increase by year 2000
Japanese B1	20% decrease by year 2000 with 10% going to B2 and 10% to grainfed yearling
Japanese B2	Residual to move in B3 and B1
Japanese grainfed yearling	residual to move in B1 & a 5% decrease in the grassfed yearling
Korean K1	not sensitivity tested - volumes not high
Korean fullsets	not sensitivity tested - volumes not high
Domestic >70 days & grain supplemented	increase total grainfed beef from 37% to 50% by year 2000

5. FUTURE DEMAND BY MARKET SEGMENT FOR AUSTRALIAN BEEF AND CATTLE NUMBERS

Given the demand projections to year 2005 of total Australian beef production and total beef export to major country markets (see Chapter 3) and applying the market disaggregation described in Chapter 4, a projection of future Australian beef disappearance by market segments and cattle numbers required to meet the respective market segments can be determined.

The following tables and charts summarise the Australian beef disappearance and cattle numbers required by market segment for each of the nine demand projection run on the GMI model plus an additional simulation which considers the effect of a variation in the mix of the grainfed market (see Table 4.6). It is emphasised that the market segment mix in future years is kept the same as the market mix in 1994 for all projections except the simulation which explicitly varies the relative proportion of grainfed market segments.

For further details of projections by market segment refer to Volume 2, Appendix A, Tables 2 to 17.

Table 5.1 BASELINE

Market Segment	1994	2000	2005	Change '94-'00
BEEF (pcw)	**(kt)**	**(kt)**	**(kt)**	**(%)**
DOMESTIC				
Grainfed > 70 Days	82	84	86	3%
Grainfed Supplemented	170	175	179	3%
Grassfed	425	436	447	3%
Total Domestic	**677**	**694**	**712**	**3%**
EXPORT				
Grainfed Japanese B3	45	52	54	16%
Grainfed Japanese B2	90	104	108	16%
Grainfed Japanese B1	82	96	99	16%
Grainfed Japanese Yearling	27	32	33	16%
Grainfed Japanese Sub-Total	**244**	**283**	**293**	**16%**
Grainfed Korean Quarter	14	25	32	75%
Grainfed Korean Fullset	2	3	4	75%
Grassfed Total Export	882	1,070	1,209	21%
Total Export	**1,141**	**1,380**	**1,538**	**21%**
AUSTRALIA				
Grainfed	511	569	594	11%
Grassfed	1,306	1,505	1,656	15%
Total	**1,818**	**2,074**	**2,250**	**14%**
CATTLE NUMBERS TO SUPPLY	('000)	('000)	('000)	(%)
DOMESTIC				
Grainfed > 70 days (50% heifer)	394	404	414	3%
Grain supplemented (50% heifer)	819	839	861	3%
Grassfed Total	2,418	2,479	2,544	3%
Total Domestic	**3,631**	**3,722**	**3,819**	**3%**
EXPORT				
Grainfed Japanese B3	174	202	209	16%
Grainfed Japanese B2	287	333	345	16%
Grainfed Japanese B1	162	188	195	16%
Grainfed Japanese Yearling	110	128	132	16%
Grainfed Japanese Sub-Total	**733**	**851**	**881**	**16%**
Grainfed Korean Quarter (40% heifer)	50	88	116	75%
Grainfed Korean Fullset (40% heifer)	6	11	14	75%
Grassfed Total	3,842	4,662	5,268	21%
Total Export	**4,631**	**5,611**	**6,279**	**21%**
AUSTRALIA				
Grainfed	2,001	2,192	2,286	10%
Grassfed	6,260	7,141	7,812	14%
Total	**8,262**	**9,333**	**10,098**	**13%**

Table 5.2 OPTIMISTIC DEMAND/COMPETING SUPPLY

Market Segment	1994	2000	2005	Change '94-'00
BEEF (pcw)	**(kt)**	**(kt)**	**(kt)**	**(%)**
DOMESTIC				
Grainfed > 70 Days	82	82	84	0%
Grainfed Supplemented	170	171	176	0%
Grassfed	425	428	438	1%
Total Domestic	**677**	**682**	**698**	**1%**
EXPORT				
Grainfed Japanese B3	45	58	58	30%
Grainfed Japanese B2	90	117	116	31%
Grainfed Japanese B1	82	107	107	30%
Grainfed Japanese Yearling	27	35	35	29%
Grainfed Japanese Sub-Total	**244**	**318**	**316**	**30%**
Grainfed Korean Quarter	14	26	44	86%
Grainfed Korean Fullset	2	3	5	76%
Grassfed Total Export	882	1,125	1,291	28%
Total Export	**1,141**	**1,472**	**1,656**	**29%**
AUSTRALIA				
Grainfed	511	600	625	17%
Grassfed	1,306	1,553	1,729	19%
Total	**1,818**	**2,154**	**2,354**	**18%**
CATTLE NUMBERS TO SUPPLY	**('000)**	**('000)**	**('000)**	**(%)**
DOMESTIC				
Grainfed > 70 days (50% heifer)	394	397	406	1%
Grain supplemented (50% heifer)	819	825	844	1%
Grassfed Total	2,418	2,436	2,494	1%
Total Domestic	**3,631**	**3,658**	**3,744**	**1%**
EXPORT				
Grainfed Japanese B3	174	227	226	30%
Grainfed Japanese B2	287	374	372	30%
Grainfed Japanese B1	162	211	210	30%
Grainfed Japanese Yearling	110	143	143	30%
Grainfed Japanese Sub-Total	**733**	**956**	**951**	**30%**
Grainfed Korean Quarter (40% heifer)	50	94	156	88%
Grainfed Korean Fullset (40% heifer)	6	11	19	83%
Grassfed Total	3,842	4,903	5,626	28%
Total Export	**4,631**	**5,963**	**6,752**	**29%**
AUSTRALIA				
Grainfed	2,001	2,283	2,376	14%
Grassfed	6,260	7,339	8,120	17%
Total	**8,262**	**9,621**	**10,496**	**16%**

Table 5.3 PESSIMISTIC DEMAND/COMPETING SUPPLY

Market Segment	1994	2000	2005	Change '94-'00
BEEF (pcw)	**(kt)**	**(kt)**	**(kt)**	**(%)**
DOMESTIC				
Grainfed > 70 Days	82	86	90	5%
Grainfed Supplemented	170	178	187	5%
Grassfed	425	445	466	5%
Total Domestic	**677**	**709**	**742**	**5%**
EXPORT				
Grainfed Japanese B3	45	50	43	12%
Grainfed Japanese B2	90	101	86	13%
Grainfed Japanese B1	82	93	79	13%
Grainfed Japanese Yearling	27	31	26	14%
Grainfed Japanese Sub-Total	**244**	**276**	**234**	**13%**
Grainfed Korean Quarter	14	23	43	64%
Grainfed Korean Fullset	2	3	5	76%
Grassfed Total Export	882	1,000	1,076	13%
Total Export	**1,141**	**1,301**	**1,358**	**14%**
AUSTRALIA	**1,818**	**2,010**	**2,100**	**11%**
CATTLE NUMBERS TO SUPPLY	('000)	('000)	('000)	(%)
DOMESTIC				
Grainfed > 70 days (50% heifer)	394	412	432	5%
Grain supplemented (50% heifer)	819	857	897	5%
Grassfed Total	2,418	2,533	2,651	5%
Total Domestic	**3,631**	**3,803**	**3,980**	**5%**
EXPORT				
Grainfed Japanese B3	174	197	167	13%
Grainfed Japanese B2	287	325	275	13%
Grainfed Japanese B1	162	183	155	13%
Grainfed Japanese Yearling	110	124	105	13%
Grainfed Japanese Sub-Total	**733**	**829**	**702**	**13%**
Grainfed Korean Quarter (40% heifer)	50	81	153	62%
Grainfed Korean Fullset (40% heifer)	6	10	18	67%
Grassfed Total	3,842	4,358	4,691	13%
Total Export	**4,631**	**5,278**	**5,565**	**14%**
AUSTRALIA	**8,262**	**9,081**	**9,545**	**10%**

Table 5.4 BASELINE PLUS FMD FREE EXPORTS FROM SOUTH AMERICA

Market Segment	1994	2000	2005	Change '94-'00
BEEF (pcw)	**(kt)**	**(kt)**	**(kt)**	**(%)**
DOMESTIC				
Grainfed > 70 Days	82	84	87	3%
Grainfed Supplemented	170	176	181	3%
Grassfed	425	438	451	3%
Total Domestic	**677**	**698**	**719**	**3%**
EXPORT				
Grainfed Japanese B3	45	53	47	19%
Grainfed Japanese B2	90	107	95	19%
Grainfed Japanese B1	82	99	88	20%
Grainfed Japanese Yearling	27	33	29	21%
Grainfed Japanese Sub-Total	**244**	**292**	**260**	**20%**
Grainfed Korean Quarter	14	21	39	50%
Grainfed Korean Fullset	2	3	5	76%
Grassfed Total Export	882	1,045	1,187	19%
Total Export	**1,141**	**1,360**	**1,490**	**19%**
AUSTRALIA	**1,818**	**2,058**	**2,209**	**13%**
CATTLE NUMBERS TO SUPPLY	('000)	('000)	('000)	(%)
DOMESTIC				
Grainfed > 70 days (50% heifer)	394	406	418	3%
Grain supplemented (50% heifer)	819	844	870	3%
Grassfed Total	2,418	2,494	2,569	3%
Total Domestic	**3,631**	**3,744**	**3,856**	**3%**
EXPORT				
Grainfed Japanese B3	174	208	187	20%
Grainfed Japanese B2	287	343	306	20%
Grainfed Japanese B1	162	194	173	20%
Grainfed Japanese Yearling	110	132	117	20%
Grainfed Japanese Sub-Total	**733**	**877**	**781**	**20%**
Grainfed Korean Quarter (40% heifer)	50	75	138	50%
Grainfed Korean Fullset (40% heifer)	6	9	17	50%
Grassfed Total	3,842	4,554	5,174	19%
Total Export	**4,631**	**5,515**	**6,109**	**19%**
AUSTRALIA	**8,262**	**9,259**	**9,965**	**12%**

Table 5.5 BASELINE PLUS HIGH WOOL PRICES IN LATE 1990s

Market Segment	1994	2000	2005	Change '94-'00
BEEF (pcw)	**(kt)**	**(kt)**	**(kt)**	**(%)**
DOMESTIC				
Grainfed > 70 Days	82	84	86	3%
Grainfed Supplemented	170	174	179	2%
Grassfed	425	434	447	2%
Total Domestic	**677**	**691**	**712**	**2%**
EXPORT				
Grainfed Japanese B3	45	52	48	17%
Grainfed Japanese B2	90	105	97	17%
Grainfed Japanese B1	82	97	89	18%
Grainfed Japanese Yearling	27	32	29	18%
Grainfed Japanese Sub-Total	**244**	**286**	**264**	**17%**
Grainfed Korean Quarter	14	22	40	57%
Grainfed Korean Fullset	2	3	5	76%
Grassfed Total Export	882	1,038	1,222	18%
Total Export	**1,141**	**1,348**	**1,531**	**18%**
AUSTRALIA	**1,818**	**2,039**	**2,243**	**12%**
CATTLE NUMBERS TO SUPPLY	('000)	('000)	('000)	(%)
DOMESTIC				
Grainfed > 70 days (50% heifer)	394	402	414	2%
Grain supplemented (50% heifer)	819	836	861	2%
Grassfed Total	2,418	2,469	2,544	2%
Total Domestic	**3,631**	**3,706**	**3,819**	**2%**
EXPORT				
Grainfed Japanese B3	174	204	189	17%
Grainfed Japanese B2	287	337	311	17%
Grainfed Japanese B1	162	190	176	17%
Grainfed Japanese Yearling	110	129	119	17%
Grainfed Japanese Sub-Total	**733**	**860**	**794**	**17%**
Grainfed Korean Quarter (40% heifer)	50	78	144	56%
Grainfed Korean Fullset (40% heifer)	6	9	17	50%
Grassfed Total	3,842	4,523	5,325	18%
Total Export	**4,631**	**5,470**	**6,281**	**18%**
AUSTRALIA	**8,262**	**9,176**	**10,100**	**11%**

Table 5.6 25% DECLINE IN JAPANESE DAIRY BEEF PRODUCTION BY 2005

Market Segment	1994	2000	2005	Change '94-'00
BEEF (pcw)	**(kt)**	**(kt)**	**(kt)**	**(%)**
DOMESTIC				
Grainfed > 70 Days	82	83	85	1%
Grainfed Supplemented	170	173	177	2%
Grassfed	425	432	442	2%
Total Domestic	**677**	**689**	**704**	**2%**
EXPORT				
Grainfed Japanese B3	45	54	50	21%
Grainfed Japanese B2	90	109	100	22%
Grainfed Japanese B1	82	100	92	21%
Grainfed Japanese Yearling	27	33	30	21%
Grainfed Japanese Sub-Total	**244**	**296**	**271**	**21%**
Grainfed Korean Quarter	14	22	38	57%
Grainfed Korean Fullset	2	3	5	76%
Grassfed Total Export	882	1,090	1,267	24%
Total Export	**1,141**	**1,410**	**1,580**	**24%**
AUSTRALIA	**1,818**	**2,099**	**2,284**	**15%**
CATTLE NUMBERS TO SUPPLY	('000)	('000)	('000)	(%)
DOMESTIC				
Grainfed > 70 days (50% heifer)	394	401	409	2%
Grain supplemented (50% heifer)	819	833	851	2%
Grassfed Total	2,418	2,461	2,515	2%
Total Domestic	**3,631**	**3,695**	**3,776**	**2%**
EXPORT				
Grainfed Japanese B3	174	211	194	21%
Grainfed Japanese B2	287	349	319	22%
Grainfed Japanese B1	162	197	180	22%
Grainfed Japanese Yearling	110	134	122	22%
Grainfed Japanese Sub-Total	**733**	**890**	**816**	**21%**
Grainfed Korean Quarter (40% heifer)	50	78	134	56%
Grainfed Korean Fullset (40% heifer)	6	9	16	50%
Grassfed Total	3,842	4,749	5,520	24%
Total Export	**4,631**	**5,726**	**6,487**	**24%**
AUSTRALIA	**8,262**	**9,421**	**10,263**	**14%**

Table 5.7 10% INCREASE IN US GRAINFED PRODUCTION

Market Segment	1994	2000	2005	Change '94-'00
BEEF (pcw)	**(kt)**	**(kt)**	**(kt)**	**(%)**
DOMESTIC				
Grainfed > 70 Days	82	85	87	4%
Grainfed Supplemented	170	177	181	4%
Grassfed	425	441	452	4%
Total Domestic	**677**	**703**	**720**	**4%**
EXPORT				
Grainfed Japanese B3	45	51	45	15%
Grainfed Japanese B2	90	102	91	14%
Grainfed Japanese B1	82	94	84	14%
Grainfed Japanese Yearling	27	31	28	14%
Grainfed Japanese Sub-Total	**244**	**279**	**248**	**14%**
Grainfed Korean Quarter	14	23	39	64%
Grainfed Korean Fullset	2	3	5	76%
Grassfed Total Export	882	1,017	1,183	15%
Total Export	**1,141**	**1,322**	**1,474**	**16%**
AUSTRALIA	**1,818**	**2,025**	**2,194**	**11%**
CATTLE NUMBERS TO SUPPLY	('000)	('000)	('000)	(%)
DOMESTIC				
Grainfed > 70 days (50% heifer)	394	409	419	4%
Grain supplemented (50% heifer)	819	850	871	4%
Grassfed Total	2,418	2,511	2,572	4%
Total Domestic	**3,631**	**3,770**	**3,862**	**4%**
EXPORT				
Grainfed Japanese B3	174	199	177	14%
Grainfed Japanese B2	287	328	292	14%
Grainfed Japanese B1	162	185	165	14%
Grainfed Japanese Yearling	110	126	112	15%
Grainfed Japanese Sub-Total	**733**	**838**	**746**	**14%**
Grainfed Korean Quarter (40% heifer)	50	83	138	66%
Grainfed Korean Fullset (40% heifer)	6	10	17	67%
Grassfed Total	3,842	4,434	5,155	15%
Total Export	**4,631**	**5,365**	**6,055**	**16%**
AUSTRALIA	**8,262**	**9,135**	**9,917**	**11%**

Table 5.8 10% DECLINE IN US GRAINFED PRODUCTION

Market Segment	1994	2000	2005	Change '94-'00
BEEF (pcw)	**(kt)**	**(kt)**	**(kt)**	**(%)**
DOMESTIC				
Grainfed > 70 Days	82	83	85	1%
Grainfed Supplemented	170	172	177	1%
Grassfed	425	429	441	1%
Total Domestic	**677**	**684**	**703**	**1%**
EXPORT				
Grainfed Japanese B3	45	56	51	26%
Grainfed Japanese B2	90	112	102	25%
Grainfed Japanese B1	82	103	94	25%
Grainfed Japanese Yearling	27	34	31	25%
Grainfed Japanese Sub-Total	**244**	**305**	**279**	**25%**
Grainfed Korean Quarter	14	30	45	114%
Grainfed Korean Fullset	2	4	5	135%
Grassfed Total Export	882	1,112	1,265	26%
Total Export	**1,141**	**1,450**	**1,594**	**27%**
AUSTRALIA	**1,818**	**2,134**	**2,297**	**17%**
CATTLE NUMBERS TO SUPPLY	('000)	('000)	('000)	(%)
DOMESTIC				
Grainfed > 70 days (50% heifer)	394	398	409	1%
Grain supplemented (50% heifer)	819	827	850	1%
Grassfed Total	2,418	2,443	2,511	1%
Total Domestic	**3,631**	3,669	**3,770**	**1%**
EXPORT				
Grainfed Japanese B3	174	218	199	25%
Grainfed Japanese B2	287	359	328	25%
Grainfed Japanese B1	162	203	185	25%
Grainfed Japanese Yearling	110	138	126	25%
Grainfed Japanese Sub-Total	**733**	**916**	**838**	**25%**
Grainfed Korean Quarter (40% heifer)	50	106	159	112%
Grainfed Korean Fullset (40% heifer)	6	13	19	117%
Grassfed Total	3,842	4,847	5,515	26%
Total Export	**4,631**	**5,882**	**6,532**	**27%**
AUSTRALIA	**8,262**	**9,551**	**10,302**	**16%**

Table 5.9 IMPROVEMENT IN AUSTRALIA'S PRODUCTIVITY TO ACHIEVE 50% INCREASE IN GRAINFED EXPORT TO JAPAN BY 2005

Market Segment	1994	2000	2005	Change '94-'00
BEEF (pcw)	**(kt)**	**(kt)**	**(kt)**	**(%)**
DOMESTIC				
Grainfed > 70 Days	82	84	86	3%
Grainfed Supplemented	170	175	179	3%
Grassfed	425	436	448	3%
Total Domestic	**677**	**694**	**713**	**3%**
EXPORT				
Grainfed Japanese B3	45	74	67	66%
Grainfed Japanese B2	90	150	135	67%
Grainfed Japanese B1	82	138	124	67%
Grainfed Japanese Yearling	27	45	41	65%
Grainfed Japanese Sub-Total	**244**	**408**	**367**	**67%**
Grainfed Korean Quarter	14	32	57	129%
Grainfed Korean Fullset	2	4	7	135%
Grassfed Total Export	882	1,029	1,190	17%
Total Export	**1,141**	**1,473**	**1,621**	**29%**
AUSTRALIA	**1,818**	**2,167**	**2,334**	**19%**
CATTLE NUMBERS TO SUPPLY	('000)	('000)	('000)	(%)
DOMESTIC				
Grainfed > 70 days (50% heifer)	394	404	415	3%
Grain supplemented (50% heifer)	819	839	862	2%
Grassfed Total	2,418	2,479	2,547	3%
Total Domestic	**3,631**	**3,722**	**3,824**	**3%**
EXPORT				
Grainfed Japanese B3	174	291	262	67%
Grainfed Japanese B2	287	480	432	67%
Grainfed Japanese B1	162	271	244	67%
Grainfed Japanese Yearling	110	184	166	67%
Grainfed Japanese Sub-Total	**733**	**1,226**	**1,104**	**67%**
Grainfed Korean Quarter (40% heifer)	50	116	203	132%
Grainfed Korean Fullset (40% heifer)	6	14	24	133%
Grassfed Total	3,842	4,485	5,188	17%
Total Export	**4,631**	**5,841**	**6,519**	**26%**
AUSTRALIA	**8,262**	**9,563**	**10,343**	**16%**

Table 5.10 BASELINE PLUS SHIFTS BETWEEN GRAINFED MARKET SEGMENTS

Market Segment	1994	2000	2005	Change '94-'00
BEEF (pcw)	**(kt)**	**(kt)**	**(kt)**	**(%)**
DOMESTIC				
Grainfed > 70 Days	82	113	121	38%
Grainfed Supplemented	170	234	251	37%
Grassfed	425	347	341	-18%
Total Domestic	**677**	**694**	**712**	**3%**
EXPORT				
Grainfed Japanese B3	45	56	58	26%
Grainfed Japanese B2	90	108	112	21%
Grainfed Japanese B1	82	79	83	-4%
Grainfed Japanese Yearling	27	40	41	47%
Grainfed Japanese Sub-Total	**244**	**283**	**293**	**16%**
Grainfed Korean Quarter	14	25	32	79%
Grainfed Korean Fullset	2	3	4	76%
Grassfed Total Export	882	1,070	1,209	21%
Total Export	**1,141**	**1,380**	**1,538**	**21%**
AUSTRALIA				
Grainfed	511	658	701	29%
Grassfed	1,306	1,417	1,550	8%
Total	**1,818**	**2,074**	**2,250**	**14%**
CATTLE NUMBERS TO SUPPLY	('000)	('000)	('000)	(%)
DOMESTIC				
Grainfed > 70 days (50% heifer)	394	542	580	38%
Grain supplemented (50% heifer)	819	1,127	1,205	38%
Grassfed Total	2,418	1,976	1,941	-18%
Total Domestic	**3,631**	**3,644**	**3,725**	**0%**
EXPORT				
Grainfed Japanese B3	174	219	227	26%
Grainfed Japanese B2	287	345	357	20%
Grainfed Japanese B1	162	156	162	-4%
Grainfed Japanese Yearling	110	161	166	46%
Grainfed Japanese Sub-Total	**733**	**881**	**912**	**20%**
Grainfed Korean Quarter (40% heifer)	50	88	116	76%
Grainfed Korean Fullset (40% heifer)	6	11	14	83%
Grassfed Total	3,842	4,662	5,268	21%
Total Export	**4,631**	**5,641**	**6,309**	**22%**
AUSTRALIA				
Grainfed	2,001	2,649	2,827	32%
Grassfed	6,260	6,638	7,209	6%
Total	**8,262**	**9,285**	**10,034**	**12%**

6. CATTLE SUPPLY

A key question for this study is, given the growth in international demand, what is the capacity of the Australian beef industry to expand competitively priced supply from the present production systems. For the feedlot sector the strategic question is how to hasten changes in the production system which would increase its ability to profit from the increased demand for fed beef.

6.1 Growth in Demand

6.1.1 Aggregate Demand

The GMI model projects that, for all scenarios, total Australian beef production by year 2000 will occur within the following boundaries:[4]

	Baseline Scenario	Optimistic Scenario	Pessimistic Scenario
Production 1994 (kt pcw))	1,818	1,818	1,818
Production 2000 (kt pcw)	2,074	2,154	2,009
Annual Growth (%)	2.2%	2.9%	1.7%

Total cattle inputs, to achieve these levels of beef production (assuming 1994 average slaughter weights and yields), are as follows: [5]

	Baseline Scenario	Optimistic Scenario	Pessimistic Scenario
No. cattle required 1994	8,262	8,262	8,262
No. cattle required 2000 ('000)	9,333	9,621	9,081
Annual Growth (%)	2.0%	2.6%	1.6%

These growth rates in aggregate cattle supply would seem achievable, given (a) that beef and veal production in Australia increased at 4.2% pa between 1985 and 1992, (b) the relative low productivity of the Australian beef industry (75 kg pcw/head of cattle population) compared to say the USA and EC which have a productivity of 106 kg/head and 101 kg/head respectively, and (c) that the Australian beef herd in the 1970s was 33 percent larger than it is now.

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[4] All other Scenarios and simulations run on the GMI model fall within the optimistic and pessimistic range. Detailed cattle supply projections for all Scenarios are shown in Volume 2, Appendix A, Tables 2 to 17.

[5] Abattoir gate for grassfed and feedlot gate number for grainfed

6.1.2 Grainfed vs Grassfed

For all scenarios, the GMI model is projecting a more rapid increase in grassfed production compared to grainfed which translates to cattle input requirements as follows:

	Baseline Scenario	Optimistic Scenario	Pessimistic Scenario
Grainfed cattle:			
- no. cattle required 1994	2,001	2,001	2,001
- no. required 2000 ('000)	2,192	2,282	2,190
- supply growth % pa	1.5%	2.2%	1.5%
Grassfed cattle:			
- no. cattle required 1994	6,260	6,260	6,260
- no. required 2000 ('000)	7,141	7,339	6,891
- supply growth % pa	2.2%	2.7%	1.6%

Notwithstanding, that a projection which shows that grassfed supply will expand more rapidly than grainfed may be different to the "industry view" (see discussion Volume 2, Appendix E), the capacity of Australia to intrinsically increase grassfed beef production is likely to be more difficult to achieve. Factors contributing to this viewpoint are: (a) the likely contraction of land for commercial cattle production through environmental degradation, expansion of National parks and native title legislation, and (b) the fact that Australian cattle productivity increase in recent years has been primarily feedlot driven.

The Market Mix Shift Scenario, which allows the domestic grainfed to increase from 37 percent to 50 percent by year 2000, is arguably more achievable in terms of resource utilisation because it requires grassfed cattle slaughter numbers to increase at only 0.98 percent per annum even though feeder steer supply would have to increase at an average 4.78 percent per annum.

6.1.3 Export vs Domestic Demand

The export market, translated into cattle supply requirements, is projected to expand more rapidly than the domestic market as follows:

	Baseline Scenario	Optimistic Scenario	Pessimistic Scenario
Export cattle:			
- no. cattle required 1994	4,631	4,631	4,631
- no. required 2000 ('000)	5,611	5,963	5,278
- supply growth % pa	3.3%	4.3%	2.2%
Domestic cattle:			
- no. cattle required 1994	3,631	3,631	3,631
- no. required 2000 ('000)	3,722	3,658	3,803
- supply growth % pa	0.4%	0.1%	0.8%

6.1.4 Demand by Grainfed Market Segment

For export grainfed market segments, feeder cattle input requirements for all GMI Scenarios are assumed to maintain the market segment mix which occurred in 1994. A variation to the market mix on feeder requirements (see Section 4.5.6 for assumptions) shows that under this scenario, fewer total slaughter cattle are required than for the Baseline Scenario. However more grainfed export cattle are required to meet the same export grainfed beef output because of the expected increase in the number of grainfed yearlings at the expense of the larger B1 carcases. Feeder cattle requirements in year 2000 by market segment are summarised below:

	Baseline Scenario	Optimistic Scenario	Pessimistic Scenario	Market Mix Shift
Grainfed Japanese B3:				
- no. required 2000 ('000)	202	227	197	219
- snpply growth % pa	2.5%	4.5%	2.1%	3.9%
Other Grainfed Export (B1,B2, Japanese yearling, Korean markets)				
- no. required 2000 ('000)	748	834	723	761
- supply growth % pa	3.3%	5.2%	2.7%	3.6%
Domestic Grainfed				
- no. required 2000 ('000)	1,243	1,222	1,269	1,669
- snpply growth % pa	0.4%	0.1%	0.8%	5.5%

6.2 Australia's Capacity to Supply at a Competitive Price

6.2.1 Regional Supply Effect

The Australian cattle population of some 26 million head [6] comprised about 90 percent beef cattle and 10 percent dairy cattle. Of the beef cattle, a little over half (52%) are found in northern Australia (Queensland, Northern Territory and the Kimberleys of Western Australia). The productivity of northern herds is considerably lower than southern herds due to lower calving rates, higher mortality and older average turnoff age. Our steady state production models indicate that, although the northern and southern beef herd is numerically about the same, the southern region produces some 59 percent or, 3.89 million steers and surplus heifers. Of the 2.69 million steers and surplus heifers produced in the northern region, the number potentially available for grain or grass finishing in Australia has to be discounted by live exports which amounted to some 250,000 in 1994 leaving about 2.44 million. Thus 61 percent of the total steer and surplus heifer production available for finishing and slaughter in Australia would be sourced out of southern breeding herds. Cattle from both regions are drawn into feedlots.

The disposition of the northern cattle breeders to supply cattle to the feedlot sector or, finish on feedlot rather than on grass, will be tempered by three main factors:

(a) alternative market opportunities (e.g. live export market); and

[6] ABS March 1993 census after correction for estimate value of agricultural operation (EVAO)

(b) imperatives of the regional environment (e.g. the need for high Brahman infused cattle, seasonal offtake etc);

(c) price offered by feedlotters for feeder cattle or, in the case of custom feeders, the relative whole-enterprise profitability achieved by grain finishing compared to grass finishing.

In terms of State supply, two-thirds of the Australian beef herd are located in two states, Queensland and NSW and consequently are the principal suppliers of cattle to the feedlot industry. Also 70 percent of meat cattle on 31 march 1993 were located in the sheep/wheat and high rainfall zones and less than 30 percent in the pastoral zone. However the pastoral zone as a calf factory is relatively more important in Queensland than in NSW. As these are the big cattle number states, this has implications for how Australian beef cattle supply might increase in response to a feedlot driven demand for more feeder cattle.

Of the total dairy herd of 2.5 million, 58 percent is located in Victoria and it is in this state that the most significant potential for dairy beef expansion lies and productivity increase through increased slaughter weights.

6.2.2 Cattle Breed Effect

The cattle breed effect on supply occurs through feedlotter preference for the Angus, Murray Grey or Shorthorn breed for cattle entering feedlots for the B3 market and the general preference for cattle which are not high grade Brahman.

The total supply of steer calves suitable for the B3 market segment is broken down by State as follows:

State	No. B3 Calves
New South Wales	166,000
Victoria	102,000
South Australia	62,000
Tasmania	24,000
Western Australia	85,000
Queensland	31,000
Total	**408,000**

Source: Consultant's herd models, ABS 1987 breed statistics & ABS regional cattle population 1983

The Southern supply region is thus the nursery for the production of B3 feeder calves within Australia and produces 87 percent (354,000 head) of the Angus, Murray Grey and Shorthorn calves within reasonable proximity of eastern State the feedlots. The noteworthy aspect of this State distribution is the very poor supply in Queensland, suggesting that feedlots in this State now targeting this market may have to concentrate on other market segments, particularly as more Japanese vertically integrated feedlots develop in southern Australia.

B3 production in 1994, requiring 174,000 feeder steers, represents about 45 percent of the calf output from the preferred breeds in reasonable proximity to eastern feedlots. Under the Baseline Scenario, by year 2000 feedlot throughput would amount to 52 percent of the B3 calf crop in the eastern States and some 76 percent if grainfed market share in Japan reached 60 percent by year 2000. Given the present high loss by downgrading of feeder steers in this market segment, competitive supply for this market will require an expansion in breed numbers, improved genotypes or a relaxation of the breed imperatives. It would seem that the shift to the Riverina of those feedlotter/processors targeting the B3 market in Japan is totally warranted. Under an expanded B3 market Scenario a strategic planning imperative would be to expand the numeric base of the preferred breed and/or genetically improve the breeds to reduce downgrading loss. It is noteworthy that the southern supply region of Western Australia produces 20 percent of the calves suitable for a Japanese B3 market but as yet does not have a grainfed export market.

A future imperative for the feedlot sector is to improve the overall efficiency of the B3 production system. There are good opportunities by genetic selection to improve the marble score performance, reduce the total fatness and so increase saleable yield and reduce the days on feed requirement to around 200 days.

Other export grainfed markets (B2, B1, Japanese yearling and Korean markets) are less breed specific and gross cattle supply for these market segments are less likely to present difficulties, although increasing pressure will be on changing the genetic profile of the Australian herd to better suit performance on feedlot, without diminishing the performance in the breeding herds.

Most of the B2 and B1 increase is expected to be sourced from the northern supply zone where, in 1993, 1.4 million steer calves [7] suitable for these market segments were produced. A greater capacity to increase productivity in the north and the already strongly developed feedlot culture would favour the northern supply region for future expansion of supply to this market segment. However there are regions within New South Wales that will produce some B2 type feeders. The high rainfall coastal region that now has similar genotypes to much of the Queensland breeding areas, has the potential to become a recognised nursery for the production of B2 type feeder steers in southern Australia and would, in terms of seasonality of supply, complement the northern supply region.

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[7] See Volume 2, Appendix A, Table 32

In excess of 90 percent (amounting to 2.2 million) of all steers produced in southern Australia, excluding Tasmania and Western Australian agricultural zone would be eligible for the production of grainfed yearling for export. However, given that 313,000 Angus, Murray Grey and Shorthorns will be target produced for B3 production and about 1 million for B2 production, then there is the scope for about 900,000 steers being available for B1 and Grainfed Yearling. Competing with the grainfed yearling will be the domestic yearling (grain and grass finished), pasture fed high quality bullocks for Japan, Canada and EC. Ultimately it will be price paid that will determine the likely grainfed yearling proportion of this residual 900,000 (assuming that the price for the B3 and B2 feeders will be the highest price and will therefore establish them as priority specifications).

6.2.3 Backgrounding Effect

Limited backgrounding capacity and/or competition with grass finishing for suitable class of country for backgrounding effects the capacity of the Australian grainfed industry supply competitively.

'Backgrounding' is the term used to describe the growing out of weaner cattle to feedlot entry weights. In Australia, backgrounding does not usually include 'preconditioning' whereby cattle are trained onto feed and most feedlots dislike preconditioned cattle. The feedlotter may buy the cattle prior to backgrounding or the cattle breeder may own the cattle through the backgrounding phase.

From the point of view of cattle supply, it is suggested that a well-established backgrounding industry has four main effects: (a) smoothing seasonability of supply of cattle into the feedlot, (b) culling potentially poor performers, (c) regulating pre-feedlot growth rates to avoid over-fatness at feedlot entry, and (d) bulking up of small drafts of cattle, particularly in southern Australia, to feedlot pen multiples. Particularly for the feedlotter/meat processor who owns the cattle in the feedlot, there are obvious financial and risk-averting advantages to be obtained from facilitating the expansion of dedicated backgrounding enterprises.

The objectives of backgrounding vary in emphasis for animals destined for different markets. For example, the main objectives of backgrounding animals for the B3 market is to ensure they are not overfat and are structurally sound at feedlot entry weight. For the Japanese B2 and B1 markets, more rigorous culling of poor performers on weight gain can be applied. For cattle going into the Korean market, which at the moment has a wide slaughter age tolerance, a dedicated backgrounding phase is less critical because lower growth rates up to feedlot entry can be tolerated. For cattle going into the yearling grainfed market, the length of the backgrounding phase is very short to zero and not critical provided the cattle are adequately weaned.

Backgrounding is expected to grow as a specialist farm activity in both the southern and northern supply region and virtually all the major feedlotters are now involved in some form of

backgrounding. Large corporate cattle breeders in the northern supply region, who are vertically linked into a feedlot or who are committed to targeting the Japanese B2 and B1 grainfed market, have acquired property or put in specialised backgrounding capacity or have custom backgrounding contracts with specialist backgrounders. In the south the common practice is for feedlotters to contract on a weight gain basis, with farmers to bring the feedlotters' weaner cattle up to feedlot entry weight.

For the age-critical market segments (Japanese B3, B2 and B1) the backgrounding phase requires the 7 - 9 month old weaner to keep growing at 0.6 to 0.75 kg per day until, depending upon the target market, they are 16 - 22 months old weighing 330 to 500 kg liveweight. These weight gains are readily obtainable during the growing season on improved dryland pasture in the south and north of Australia but inevitably, at some tie of the year, supplementary feeding or irrigated forage production is required.

In the southern supply region it is expected that cattle fed in high rainfall northern, central and southern tablelands will be backgrounded on the more favourable adjacent slopes using grazing oats and/or winter pastures such as phalaris, rye grass and clover. The other option is for tableland bred cattle to be background fed on the irrigation country of the Lachlan, Murrumbidgee and Murray systems. The feedstuff utilised here may well include pasture, or as is starting to occur, maize silage.

In the northern supply region, the backgrounding operation is preferably located in the endowed (sheep/wheat) or high rainfall zones where fail-safe weight gains can be achieved by supplementary feeding. In the northern supply region there is an array of options for reaching 0.6 kg/day liveweight gain during the dry season, including sorghum silage, fortified molasses (eg M3U + cottonseed meal + Rumensin), whole cotton seed, and special purpose stand-over pastures (e.g. Leucaena or ponded pastures). Although initially driven by drought feeding, on-farm supplementary feeding infrastructure is now common place on beef cattle breeding properties in coastal and sub-coastal Queensland. Thus, in these areas the move to production feeding of weaners for feedlot entry is, in capital terms, painless and, given the right price signals for feedlot entry cattle, could evolve rapidly.

In the tropics, a good correlation between weight gain of weaners at the backgrounding phase and feed conversion in the feedlot [8] enables preselection of good performers before they go onto feed. One of the vertically integrated corporate breeder/feedlotter interviewed in this research is weighing weaners onto the backgrounding property and re-weighing three months later. The top one-third go onto feedlot, the middle one-third onto crop finishing and the bottom one-third onto grass finishing. It is noteworthy that there is a better correlation between cattle growth rate on grass and feedlot feed conversion than the reverse. In other words, breeding for high feed

[8] Heather Burrows, CSIRO, Rockhampton, personal communication

conversion on the feedlot is best done in the backgrounding phase if mutual advantage to the breeder and feedlotter is to be achieved in the tropics.

An expansion of backgrounding feeding in the endowed (sheep/wheat) zones will probably necessitate backgrounding substituting for some cattle breeding activities. The offset to this is that cattle will be turned off breeding regions earlier and a corresponding increase in breeder herd size will occur in the later. Increased backgrounding capacity will be critical to sustainable expansion of the Australian cattle industry to meet both grainfed and grassfed future markets.

Under all Scenarios an expansion of grass finishing and backgrounding capacity is required and competition for quality grassland (in more climatically secure environments) between feedlot backgrounding and grass finishing, will increase.

The endowed (sheep/wheat) regions of Australia are the discretionary regions for breeding, grass finishing and feedlot backgrounding. Here the on-farm mix of beef activities will be determined by the relative profitability of the three, and the perceived risk-spreading which arises from diversifying into two or more activities. Substitution between alternative activities, as well as absolute expansion in capacity, will occur.

Backgrounding is an essential requirement for cattle destined for the Japanese B3, B2 and B1 grainfed markets whereby the cattle have to be grown out from weaning to a feedlot entry weight of around 400 kg. Ignoring the yearling grainfed animal (export and domestic) as requiring substantial backgrounding capacity, the increase in the backgrounding carrying capacity for three example Scenarios by year 2000, is shown in Table 6.1

Table 6.1 INCREMENTAL BACKGROUNDING CAPACITY FOR THREE SCENARIOS IN YEAR 2000

Market Segment	Scenario	Average Period Backgrounding (months)	Incremental Backgrounding Carrying Capacity ('000 AE) \1
Japanese B3	Baseline	9	21
	Optimistic	9	40
	Market Segment shift	9	34
Japanese B2 & B1	Baseline	11	66
	Optimistic	11	125
	Market segment shift	11	48

\1 AE = adult equivalent being an animal weighing 450 kg liveweight

Given endowed zone dryland sown pasture carrying capacities of say 2.5 ha/AE and 2.0 ha/AE respectively, for the northern and southern supply regions, and with all the B3s backgrounded in the southern region but otherwise 50 percent share of backgrounding between the regions, these

data indicate that for the Baseline Scenario there would be a need for an additional 82,500 hectares in the northern region and 105,000 hectares in the southern region to background cattle in year 2000. In practice, supplementary feeding, irrigated forage production and use of forage crops will moderate the area required.

6.2.4 Seasonal Supply Effect

Seasonality of supply is not a major constraint to competitive supply.

Seasonality of feeder supply, dictated ultimately by the seasonality of calving in breeding herds, is postulated as an issue for beef markets demanding continuity of supply. From a national perspective, the spring calving pattern of northern Australian cattle herds is offset by the dominance of autumn calving in southern Australia. Strategically located feedlots in northern NSW and southern Queensland can, to some extent, exploit this complementary seasonality to achieve continuity of intake.

In northern Australia (Qld, NT and NW WA) calving generally occurs in the late dry, early wet season. In the 43% of herds which control joining in northern Australia[9] the joining period ranged from 6.0 to 7.7 months with bulls first entering the herd, depending upon the location, over 3 months from October to December. This in effect gives a calving spread for northern Australia as a whole of 9 months in control-mated herds. In the more harsh environments in those herds where mating was controlled, bulls tended to be in herds from December to July and in the southern endowed region of Queensland bulls were generally in the breeding herd from October to April. For practical reasons, bulls remained continuously in most herds in the more extensive northern areas but were seasonally mated (up to 75% of herds) in southern Queensland. In the high rainfall zone 63% of herds continuously mated with a higher probability of year round calving.

These data suggest that, in a national sense, seasonality of calving may not be a problem but due to the seasonal selling imperatives, particularly of northern producers, seasonality of demand for feedlot space does occur. This is supported, in part, by the seasonality to Queensland pen occupancy which has a peak in Winter and trough in Summer.

The implication is that continuity of supply to feedlots needs to be improved. One possible solution would be an expansion of dedicated backgrounding enterprises which, apart from keeping cattle growing, form the valuable function of marshalling cattle lines by feedlot entry specification throughout the year. Backgrounders would necessarily source cattle from different areas at different times of the year to accommodate the dominant calving patterns of these different areas. It would be managerially more difficult for breeding enterprises to shift calving patterns to offset

[9] O'Rourke et al (1992) North Australia Beef Survey

feedlot entry troughs and probably not economically tenable unless a good premium was paid for 'out-of-season' calves. The best option to addressing the seasonality of supply will come from exploiting the existing region to region and property to property spread of calving.

6.2.5 Supply Pattern Effect

Supply catchment areas for feedlots are extensive and as the number of feedlots increase, and their geographic spread widens, it is axiomatic that the supply patterns of the feedlot sector as a whole, and individual feedlots in particular, will change.

Empirical data on interstate cattle movements is scant and intra State movements can only be gleaned from interview. There is a two-way widely fluctuating flow between NSW and Queensland. A regular annual flow of cattle occurs from southern Northern Territory into South Australia. Southern Western Australia is generally isolated from significant interstate movements. A free flow of cattle occurs between NSW and Victoria and to a lesser extent between South Australia and Victoria and NSW. Freight subsidies between Tasmania and the mainland have encouraged some live cattle movements from Tasmania to Victoria and NSW. Some cattle movements from Victoria to Queensland feedlots have been recorded. Table 6.2 ranks the volume of interstate cattle flows.

Table 6.2 INTERSTATE CATTLE FLOWS

To\ From	NSW	QLD	NT	WA	SA	VIC	TAS
NSW		H	N	N	N	M	N
QLD	H		H	N	N	N	N
NT	L	H		L	M	N	N
WA	N	N	L		N	N	N
SA	L	N	N	N		M	N
VIC	H	L	N	N	L		L
TAS	L	N	N	N	N	M	

H = high, M = moderate, L = low, N = negligible

This analysis suggests that WA can be treated as an isolated production cell. All other adjoining states have moderate to high across-border cattle flows. Significant cattle movements occur between the northern and southern supply regions, in particular between NSW and Queensland, and from the point of view of matching supply and demand have to be treated as one cell.

In the northern supply region, supply patterns, for cattle going into the premium grain or grass finished markets, are typically from the north and west into the south east of Queensland where

cattle are finally slaughtered. This is reflected in the spread of corporately-owned properties which have 47 percent of their carrying capacity in specialised breeding properties in the Northern Territory and northern Queensland, a further 22 percent of carrying capacity in integrated breeding and finishing activities in SW Queensland and 31 percent of carrying capacity in specialised grass finishing/backgrounding activities in southern Queensland (Volume 2, Appendix A, Table 26, Appendix B, Maps 6 and 7). In general, corporations which have their breeding properties in the preferred feedlot supply areas (see Volume 2, Map 1c) will have the breed of cattle most suited to the grain finishing market, whereas corporate breeding properties located in the Brahman imperative far north will primarily direct their steer offtake to grass finishing, with perhaps cull heifers being finished on grain for the domestic market.

Within the southern supply region, B3 type feeder steer movements are typically from the breeding zones in the High Rainfall regions of New South Wales (excluding the coastal region) and the Sheep/Wheat zone of that State, into the feedlots of the Riverina; that is, to the feedlots at Narrandera, Wagga Wagga and Hay. To a lesser extent B3 type cattle move to the Northern slopes feedlots around Quirindi. Movement of B3 type feeder steers also occurs from the breeding areas of south east South Australia and throughout Victoria, to the feedlots in Victoria's north and to the merging lots in the Riverina region of New South Wales.

6.2.6 The Drought Effect

We have not attempted to quantify the impact of the present drought, in terms of short term cattle supply. Over the long term planning horizon of this study, and given that the drought does not last for another 12 months, it is our view that the impact on the cattle supply to the feedlot sector will be minimal.

For the feedlotter, drought means:

- feedgrain supply decrease and price increase;
- cattle supply increase and price decrease;
- and reducing age of cattle on feed during the drought;
- post drought cattle supply decrease;
- decrease in the quality of cattle on feed;
- re-opening of old opportunity feedlots and the establishment of new opportunity feedlots.

For the cattle breeder, the availability of feedlot capacity in times of drought enables:

- earlier decision to lighten-up stocking rate and, as a consequence, greater drought security.

Undoubtedly the continuing drought in eastern Australia since the early 1990's has spurred the expansion of feedlot capacity. Mostly, it is expected this drought-driven feedlot expansion will be permanent.

6.2.7 Feedlot Capacity Effect

Current total capacity of feedlots (ie. with more that 500 head capacity), according to the ALFA survey in May 1994, amounts to 542,000. For all feedlots with a capacity greater than 100 head the aggregate capacity is estimated at around 662,000 which is assumed to represent the capacity of dedicated feedlots. Expansion plans from a few major operators would take feedlot capacity to over 1.2 million head by year 2000. The indications are that future expansion will be strongly biased towards NSW (+ 370,000 head) which will usurp Qld (+ 164,000 head) as the premier feedlot State. Insignificant expansion is planned in other States. Table 6.3 illustrates.

Table 6.3 FEEDLOT CAPACITY ('000 head)

State	Present Capacity Feedlots > 500 head \1	Present capacity Feedlots > 100 head \2	Planned Future Capacity by Year 2000 \3	Planned Capacity Increase by Year 2000
Qld	259	323	487	164
NSW	187	233	605	372
Other	96	106	110	4
Total	**542**	**662**	**1202**	**540**

\1 ALFA survey May 1994

\2 Consultants estimates based on comprehensive records for Qld and estimates for other States

\3 Expansion applications

Plans by the feedlot industry to expand capacity would appear to be in excess of pen space required to meet the market for fed cattle projected in this study. For the future high feedlot demand scenario (Market Shift - see Table 5.10)), 53% utilisation (down from 73% in 1994) is indicated by year 2000 if present expansion plans are implemented. For the high feedlot use scenario a 20 percent expansion of the feedlot capacity is indicated to meet the projected demand for grainfed cattle. Table 6.4 refers.

Table 6.4 RECONCILIATION OF FEEDLOT CAPACITY AND DEMAND PROJECTIONS FOR GRAINFED CATTLE

	Year 1994	Year 2000 Baseline Scenario	Year 2000 Optimistic Scenario	Year 2000 High Feedlot Use Scenario\1
Total grainfed cattle throughput ('000 hd)	2001	2192	2283	2649
Grainfed cattle throughput in dedicated feedlot sector ('000 hd) \2	1593	1774	1871	2086
Required feedlot capacity to service dedicated sector @ 80% utilisation ('000 hd) \3	617	698	750	796
Estimated present or planned future capacity ('000 hd)	662	1202	1202	1202
Estimated feedlot utilisation (%)\4	73%	46%	50%	53%

\1 Market Mix Shift Scenario; see Table 5.10 for assumptions.

\2 Dedicated feedlot sector is assumed to include 50% of supplementary grainfed cattle.

\3 Equals days on feed by number of cattle for respective market segments.

\4 Compare to 80% which is the normal operational utilisation.

The extent to which the feedlot capacity needs to be expanded will depend not only on the rate of growth of export and domestic demand for grainfed beef but also on trends in the opportunity feedlot sector. At present this sector accounts for some 819,000 cattle annually and some industry observers expect that there will be considerable contraction in the opportunity feedlot sector in the future. The pressure for contraction in this sub sector is likely to grow once feed supplies return to normal and as declining feedlot profit margins leads to efforts to improve efficiency. Hence it is possible that some of the planned expansion in feedlot capacity is based on a commercial judgement that opportunity feedlotting will contract. If it is assumed that pasture supplemented feedlotting contracted by 50% and these cattle were in dedicated feedlots for 100 days, the required feedlot capacity by year 2000 under the high feedlot demand scenario would be around 900,000 head indicating that feedlot utilisation, under the present expansion plans would be around 60%.

It is noted that most new and expanded commercial feedlot are based on perceived geographic competitive advantage in terms of availability of specified cattle requirements and in terms of cost

and reliability of supply of feed inputs. Expansion of opportunist feedlots which has actually occurred, or has a high probability of occurring, has been primarily drought driven with little consideration of market outlets. With the indications of overcapacity and the continuing consolidation of feedlots in regions of competitive advantage, it is likely that some feedlots will cease to be viable. From the national viewpoint competitive supply of grainfed beef would be enhanced.

With respect to present and future capacity in other states, the following comments refer:

- **Western Australia** grainfed beef is all consumed by the domestic market and 'grain supplementation' is common. A working group looking at strategies for the Asian market is considering the opportunities to initiate a grainfed export beef market. This would most likely be based in the south west agricultural zone where supplies of grain are abundant and cattle number adequate.

- **Tasmania** has one major feedlot (Tasman Feedlots) which is vertically integrated into a Japanese retail outlet (Jusco) and future expansion is limited by cattle supply;

- **Northern Territory** does not have any feedlots and will probably continue to export grass finished beef or live cattle;

- **South Australia** has one major export linked commercial feedlot (Metro Meat International); market linkages and expansion intention not known;

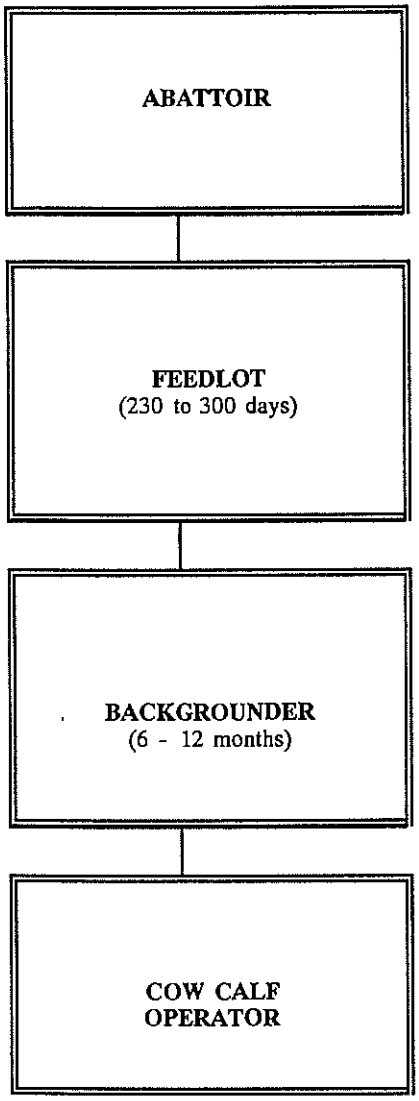
- **Victoria** has two major commercial feedlot (ICM Farms and Charlton) which service both the domestic and export market; expansion intentions in Victoria not known.

6.2.8 Feeder Cattle Production Systems Effect

The strengths and weaknesses of grainfed cattle production systems and the opportunities to improve these are pertinent to the cattle input requirements of the feedlot sector. The cattle production systems for the seven grainfed market segments supplied by Australia (namely, the Japanese B3, B2, B1 and grainfed yearling, Korean K1 and fullsets and Australian domestic grainfed) are reviewed.

Japanese B3 Production

The production system for the B3 market segment is outlined below:



OUTPUT
Weight : 380 kg - 420 kg
Age : 24 - 28 months
Fat Depth: : 17 - 27 mm
Saleable Yield : 67 - 69%
Marble Score : 3 & 4
Texture Firmness : 4 & 5

OUTPUT
Weight : 680 kg - 720 kg
Age : 24 - 28 months
Daily Gain : 1.1 - 1.3 kg
FCR(DM basis) : 8.0 - 10.0: 1

INPUT
Weight : 380 kg - 420 kg
Age : 16 - 18 months

OUTPUT
Weight : 380 kg - 420 kg
Age : 16 - 18 months
Daily Gain : 0.6 - 0.75 kg

INPUT
Weight : 250 kg - 280 kg
Age : 10 months

OUTPUT
Weight : 250 kg - 280 kg
Age : 9 months
Daily Gain : 0.8 - 0.9 kg

Days-on-feed is a stipulation of this market segment and it is important to the study in that it is the criteria that will influence the amount of grain and roughage required. It is significant that the roughage requirement is up to 30 percent higher than for the B2, B1 and yearling systems, with roughage quality being of greater concern to the B3 system.

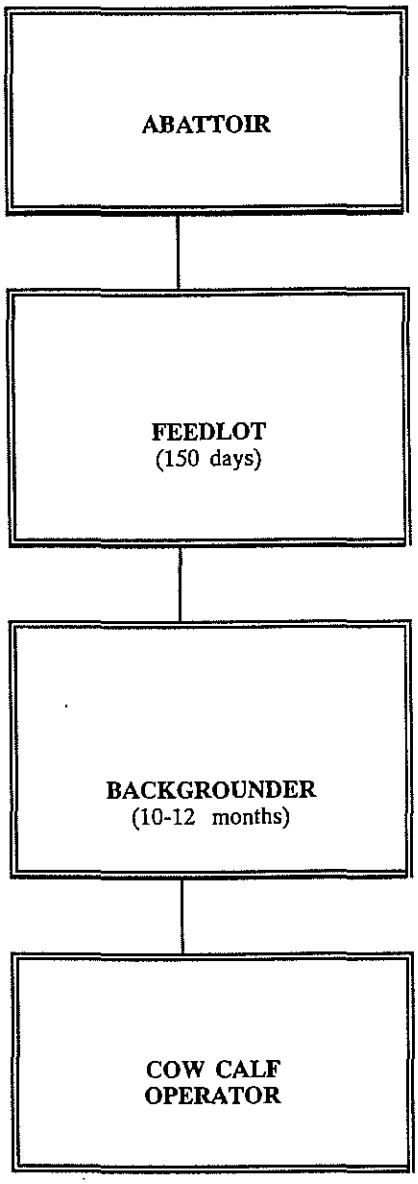
The backgrounding phase, while generally not as long as for the B2 market segment, is critical to the achievement of market specification. The potential to expand the backgrounding capacity, consistent with market expansion will be a significant factor in future penetration of this market segment.

The Murray Grey, Angus and Shorthorn breeds are preferred because of their recorded abilities to achieve marble scores of 3 and 4 and so produce B3 status. It is unfortunate that meat

importers have had to use breed and days on feed to prescribe their specifications to the Australian supplier. Ideally the customer (in this case the Japanese importer) should have access to a grading system based on both yield and quality parameters. If this was the case, the supplying companies within Australia could be in a position to supply according to meat specifications. Instead the importer has had to impose production based specification parameters (breed and days-on-feed) which have not proven all that efficient as far as the supplier is concerned. Currently, about 55 percent of the cattle slaughtered for B3s fail to achieve the 3 and 4 marble score and of these a significant proportion are grossly over-fat, with a reduction in saleable yield. The majority of the 55 percent that fail to reach the B3 specification with respect to marbling are downgraded to B2's. However a 230 - 300 day feeding regime is a very expensive method of achieving B2's as they receive from between 25 - 30 percent less per kg wholesale in Japan than the B3's and it costs 23 percent to 38 percent more to produce.

Japanese B2 Production

The production system for the Japanese B2 market segment is as follows:



OUTPUT
Weight : 360 kg
Age : 24 - 28 months
Fat Depth : 12 - 22 mm
Saleable Yield : 69 - 70%
Marble Score : 2
Texture Firmness : 4 & 5

OUTPUT
Weight : 680 kg
Age : 24 - 28 months
Daily Gain : 1.5 - 1.6
FCR (DM basis) : 7.5 - 8.0: 1

INPUT
Weight : 400 - 500 kg
Age : 20 - 22 months

OUTPUT
Weight : 400 - 500 kg
Age : 20 - 22 months
Daily Gain : 0.6 - 0.75 kg

INPUT
Weight : 210 - 240 kg
Age : 10 months

OUTPUT
Weight : 180 kg - 240 kg
Age : 7 - 9 months
Daily Gain : 0.7 kg

The production of B2s is being encouraged across a vast range of breeding country in Australia, the exclusion zones being those areas with high Bos indicus contents. The majority of the B2's are finished with 150 days on feedlot. It is significant that the grain component is around 20 percent higher than for B3 production. Roughage quality is not quite as important to the production of B2's as it is with B3's and so rather than use silage type products, cereal crop residues can suffice.

The backgrounding phase is most important for producers targeting this market segment requiring 10 to 12 months with weight gains of 0.6 to 0.75 kg live weight gain per day to meet the weight

the age specifications. Major expansion of the B2 market is projected and an attendant increase in backgrounding capacity will be required for this market segment to develop unhindered.

Due to the lack of a grading system in Australia, inefficient production based specifications are used. For instance the majority of feedlots specify maximum of 50% Bos indicus content and 150 day feeding period to achieve this specification. At the moment some 35% of the cattle slaughtered for B2s fail to achieve the marble score of 2 and are downgraded to B1's. This is an expensive method of producing the B1 which really only require 100 days feeding.

There are plenty of opportunities of improving the B2 production system. Pre-selection in the backgrounding phase plus genetic selection in the breeding herds would mean 90 - 95% of cattle placed on feed achieving the marble score of 2 in 120 days feeding being an achievable goal. Accompanying the increase in marbling there needs to be a reduction in total fatness and an improvement in fat distribution which will improve saleable retail yield.

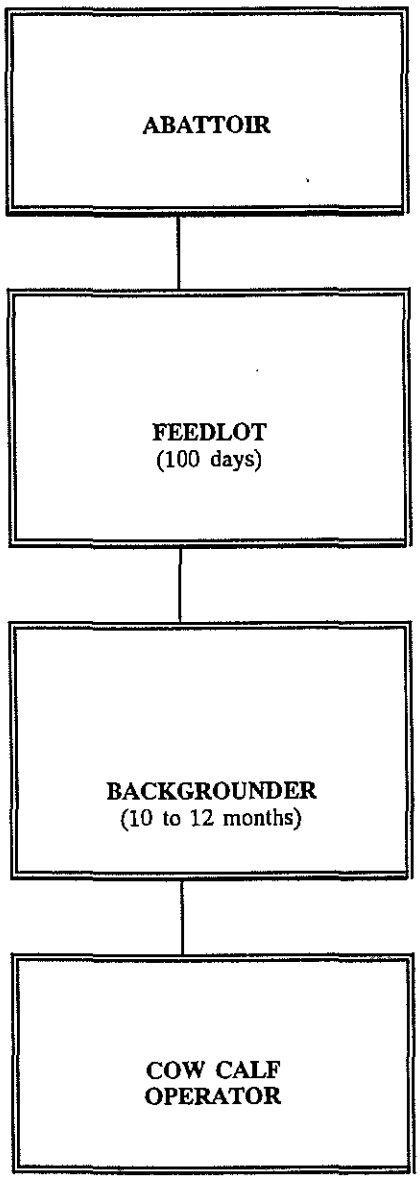
There is an advantage to the feedlotters who can source B2 type steers from both northern and southern Australia which will give continuity of supply from complementary spring and autumn calvings.

The European, European crosses and other unspecified crosses do have the potential to target the B2 production system. The abilities of these breed combinations to marble at the required level does vary, but generally falls within the range of 55 - 65 percent. The real advantage this grouping has, in particular the European and European crosses, is their ability to achieve high boning room yields. The challenge therefore for this breed grouping is to lift marbling potential, or to concentrate on yield and growth and specifically target the shortfed B1 target that has no marbling requirements.

There is no doubt that the heifer portion produced for this cross, many of which are terminal crosses, can be utilised in the Korean market and also in the domestic grassfed and grainfed markets.

B1 Production

The production system for the Japanese B1 market segment is as follows:



OUTPUT
Weight : 330-360 kg
Age : 26 - 30 months
Fat Depth : 12 - 20 mm
Saleable Yield : 70% plus
Marble Score : 1
Texture Firmness : 4 & 5

OUTPUT
Weight : 600- 660 kg
Age : 26 - 30 months
Daily Gain : 1.6
FCR (DM basis) : 6.0 - 7.0: 1

INPUT
Weight : 400 to 500 kg
Age : 22 - 26 months

OUTPUT
Weight : 400 kg to 500 kg
Age : 22 - 26 months
Daily Gain : 0.6 kg

INPUT
Weight : 190 to 240 kg
Age : 10 months

OUTPUT
Weight : 1980 to 240 kg
Age : 7 - 9 months
Daily Gain : 0.7 kg

The B1 specification is characterised by a minimum 100 day feeding period which in effect converts the grassfed beef into a more acceptable product. That is, the grain feeding enables supply as scheduled thereby guaranteeing consistent turn-off. Further it ensures a more consistent quality by reducing the fat colours within the acceptable range and by changing the odour to a grainfed rather than pasture of grassfed odour.

Marbling is not a criteria with the production of B1 type cattle. The main objective is to feed the cattle long enough to ensure that the fat structure has had sufficient time to be altered to similar configurations to the Japanese produced Holstein and US grainfed. The meat texture requirements will need close scrutiny if higher than 50% Bos indicus blood is used.

In the feedlot phase, the grain component of the ration for B1 production will be 80 percent or more and the emphasis is on maximum gain, with many feedlotters taking advantage of compensatory gain in order to achieve their profit margins. It is important to ensure that the B1 is slaughtered prior to the onset of darker meat colours and higher connective tissue content criteria starts occurring past 30 months. Even though the B1 is downgraded in price by about 30 percent when compared to the B2, it still must be reasonably tender and exhibit even fat distribution in order to maintain acceptability.

Substantial B1 production comes presently from downgrades out of the B2 system, and will continue to be supplied this way until the efficiency of the B2 production system is improved, and from those producers who for one reason or another, decide not to target the growth rate, marbling and saleable yields necessary for the B2 production.

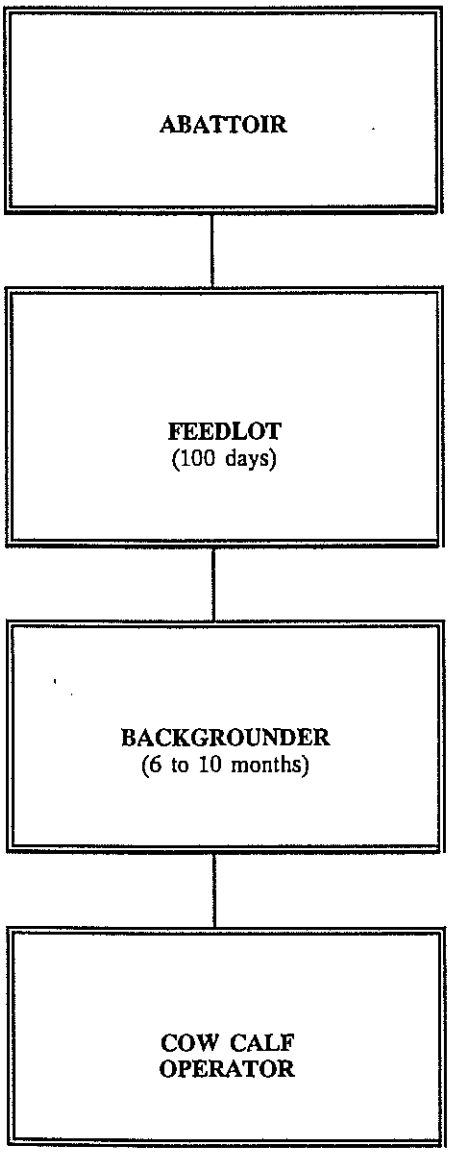
For example, the Bos indicus crosses produced in coastal New South Wales may not achieve the desired growth rates to enable them to fulfil the B2 entry specification. Likewise many of the British crosses and Hereford steers will have problems achieving the B2 marbling requirements at acceptable saleable yields given the 150 day feeding requirement. Any reduction in days-on-feed and an increase in weight/age of the steers going on feed will mean they will satisfy the B1 requirement more readily. The European, European crosses and other unspecified groupings may have problem marbling. However, they will achieve above average growth rates on feed coupled with high saleable yields suitable for the B1 market.

The production of B1 cattle will not require as sophisticated a backgrounding phase as either the B3 or B2 and will therefore appeal to many producers and feedlotters. However to achieve a slaughter age of less than 30 months will still require moderate growth rates during a dedicated backgrounding phase.

It may well be that the costs of producing the B1 type steer in southern Australia will not warrant a special designated production system. The downgrades from the B2's will provide some B1's but where growth rates up to 14 months are high enough may be best suited to grainfed yearling production.

Japanese Grainfed Yearling

The production system for the grainfed yearling market segment is as follows:



OUTPUT

Weight	:	240 kg - 260 kg
Age	:	16 - 20 months
Fat Depth:	:	8 - 12 mm
Saleable Yield	:	70%
Marble Score	:	1
Texture Firmness	:	4 & 5

OUTPUT

Weight	:	420 kg - 470 kg
Age	:	18 - 20 months
Daily Gain	:	1.4 kg
FCR (DM basis)	:	6.0 - 6.5 : 1

INPUT

Weight	:	290 kg - 350 kg
Age	:	15 - 17 months

OUTPUT

Weight	:	290 kg - 350 kg
Age	:	15 - 17 months
Daily Gain	:	0.6 - 0.8 kg

INPUT

Weight	:	170 kg - 220 kg
Age	:	10 months

OUTPUT

Weight	:	170 kg - 220 kg
Age	:	7 - 9 months
Daily Gain	:	0.65 - 0.75 kg

The grainfed yearling for Japan must be fed on grain for 70 to 100 days. Marbling is not a criteria with the production of the grainfed yearling through an intra-muscular fat content of the eye muscle at the grade site of about 3 percent will certainly enhance the acceptability of this specification amongst the Japanese consumers. The chief selling attribute of the yearling is its inherent tenderness and lack of offensive odours. That is, similar to those produced from the Japanese Holstein and US grainfed (120 - 150 days).

The grainfed yearling is slaughtered at around 18 months so that the meat will be tender. The slaughter age pre-determines the age of entry into the feedlot and backgrounding procedures. Slaughter below 16 months causes the meat colour to be too pink; there is preference in Japan for

the bright red colours (B2) as distinct from 1A. Further as age at slaughter is reduced, so "free" moisture content of the muscles increases, the Japanese loathe "wet, mushy meat".

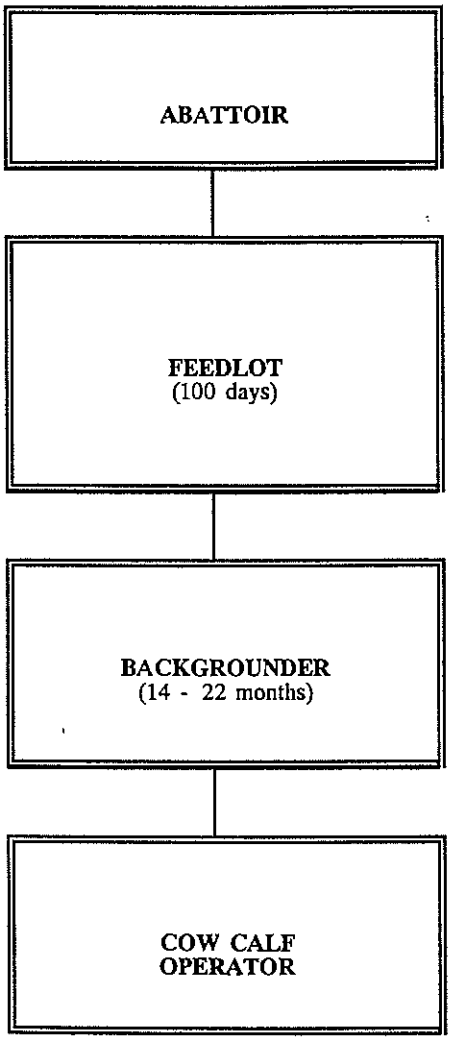
Care needs to be taken with the maturity patterns of the cattle fed to produce the grainfed yearling. The maturity pattern should not be "too late" otherwise growth may well be achieved to the level that fulfils healthy feedlot profits but prevents any fat deposition over the butt cuts which will then render them susceptible to freezer burn. Likewise it should not be too early which will result in excessive fat deposition and so reduce saleable meat yield. Fat distribution in the lighter weight carcases is an important criteria.

The grainfed yearling specification does not pose as large a demand on backgrounding as does the B3 and B2. This, coupled with the no marbling requirement, makes it an attractive production system for the future where backgrounding costs are high.

The all-year round supply of grainfed yearlings should not present too much of a problem as they will be able to be drawn from both spring and autumn calving regions, within southern Australia. If a problem were to arise with all year supply, it will be from spring calves in New South Wales. This shortfall could be augmented with steers from SE Queensland. Hopefully in the future heifers might be able to be supplied into this specification provided they can achieve the meat specifications.

Korean Quarter Beef (K1)

The production system for the Korean K1 market segment is as follows:



OUTPUT
Weight : 220 - 320 kg
Age : Maximum 6 teeth
Fat Depth : 5 - 10 mm
Saleable Yield : 70% plus
Sex : Steer and heifer

OUTPUT
Weight : 400 - 580 kg
Age : Maximum 36 months
Daily Gain : 1.6 kg
FCR (DM basis) : 6.5 - 7.0: 1

INPUT
Weight : 250 - 430 kg
Age : 24 - 32 months

OUTPUT
Weight : 250 - 430 kg
Age : 24 - 32 months
Daily Gain : 0.3 - 0.8 kg

INPUT
Weight : 150 - 170 kg
Age : 10 months

OUTPUT
Weight : 150 - 170 kg
Age : 7 - 9 months
Daily Gain : 0.55 kg

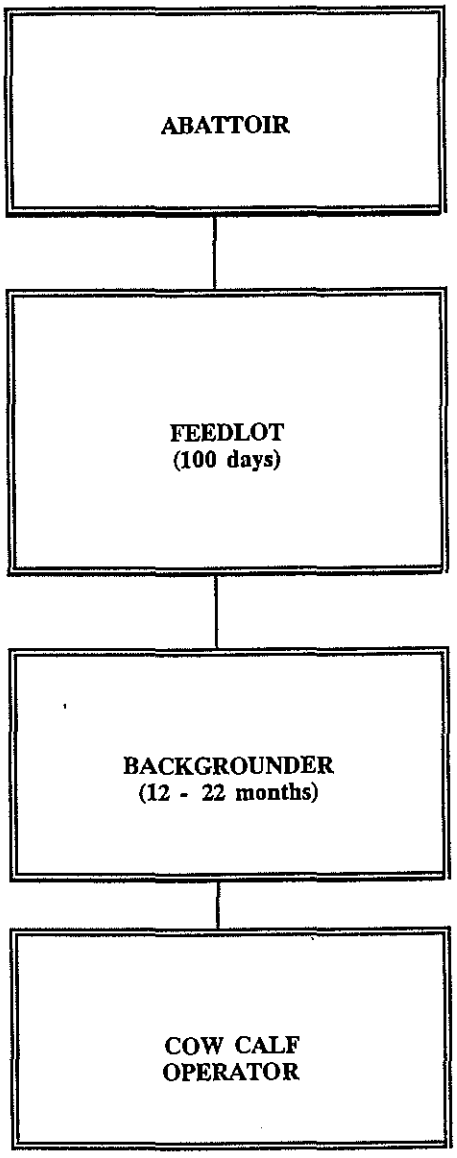
Currently Australia exports frozen grainfed quarter beef to Korea in accordance with the K1 specification and some grainfed fullsets into the SBS system.

There are no breeds excluded from this specification although it is difficult to achieve a "C" or better butt shape with a straight bred dairy steer of heifer and with some straight bred British breed and Bos indicus heifers.

This production system is very achievable, it really does suit the coastal regions where the growth rates at pasture are not all that high. It is expected that the K1 specification will decline in popularity between now and 2001 (liberalisation in Korea). Further given that Korea is a tendered market it is difficult to advise producers and feedlotters to actively seek out this specification.

Korean Fullsets

The production system for the Korean fullset market segment is as follows:



OUTPUT

Weight	:	280 - 350 kg
Age	:	24 - 36 months (6 teeth)
Fat Depth	:	7 - 17 mm
Saleable Yield	:	70%
Marble Score	:	1
Texture Firmness	:	3

OUTPUT

Weight	:	500 - 650 kg
Age	:	24 - 36 months
Daily Gain	:	1.6 plus
FCR (DM basis)	:	6.5 - 7.0: 1

INPUT

Weight	:	330 - 470 kg
Age	:	22 - 32 months

OUTPUT

Weight	:	330 - 470 kg
Age	:	22 - 32 months
Daily Gain	:	0.4 - 0.8 kg

INPUT

Weight	:	160 - 190 kg
Age	:	10 months

OUTPUT

Weight	:	160 - 190 kg
Age	:	7 - 9 months
Daily Gain	:	0.6 kg

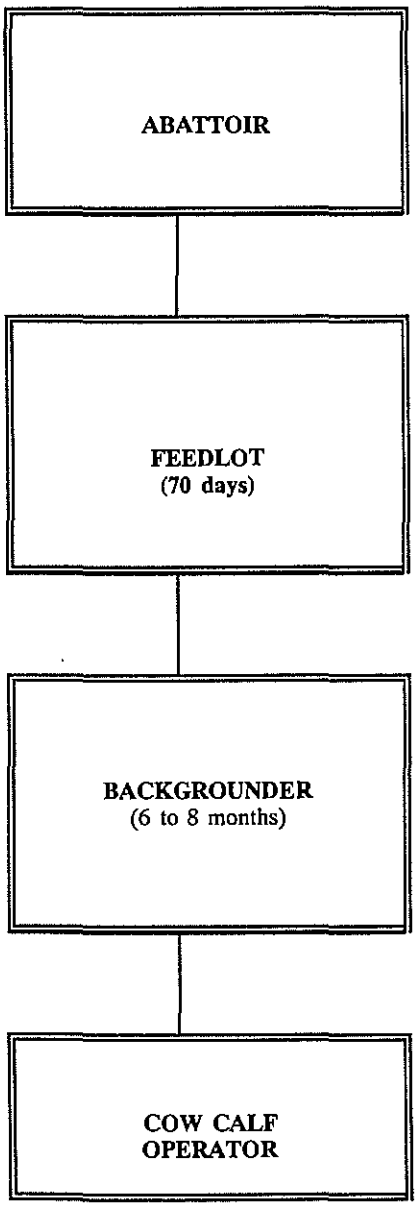
The Korean fullset specification is very similar to the Japanese B1 and the preference at this stage would be for the 6-teeth cattle prepared for the Japanese market to be transferred to the Korean fullset market at least until liberalisation. The Australian grainfed industry should continue to strive to ensure that the maximum age of slaughter from the feedlots is 30 months. The Korean fullset age specifications of 24-36 months from now until 2001 (liberalisation) will give the Australian industry time to improve the genetics and production systems to ensure a 30-months maximum age of turn-off, with attendant improvement in eating qualities, can be achieved.

The Korean's currently do not have a problem with heifers in their P1 and K1 specification. There would appear to be no reason to exclude heifers from the fullset specification provided they can achieve the growth rate and fat (saleable yield) requirements.

The significant difference between the current Japanese B1 and the Korean fullset specification is the size tolerance. This tolerance does allow producers some latitude in their growth rates at the farm level up to weaning and then during the backgrounding phase. A growth rate of 0.4 kg/day for the backgrounding phase is slow and in future may well be uneconomical, unless it is achieved on unimproved country of low value. As well as the age tolerance there is a wide carcase weight tolerance (280 - 380 kg). However it might be that the carcase weights need reducing for Korea given the fact that the cuisine is different to that of Japan. Prior to liberalisation in Korea it would be essential to determine the required portion and sub-primal sizes and weights so that the carcase weights and then the production sub-systems adjusted accordingly

Domestic Grainfed Market

The future production system for the domestic grainfed market segment is expected to be as follows:



OUTPUT
Weight : 240 kg - 260 kg
Age : 16 - 20 months
Fat Depth: : 6 - 10 mm
Saleable Yield : 70% plus
Marble Score : 1.5 - 2.5
Texture Firmness : 4 & 5

OUTPUT
Weight : 420 kg - 450 kg
Age : 20 months
Daily Gain : 1.4 kg
FCR : 5.5 - 6.5 : 1

INPUT
Weight : 330 to 350 kg
Age : 16 - 18 months

OUTPUT
Weight : 330 to 350 kg
Age : 16 - 18 months
Daily Gain : 0.6 kg

INPUT
Weight : 170 to 220 kg
Age : 10 months

OUTPUT
Weight : 170 kg - 220 kg
Age : 7 - 9 months
Daily Gain : 0.65 kg - 0.75 kg

Droughts, increased competition from chicken and pork plus the desire from retailers (in particular the supermarkets) and food service to supply consumers with a consistent quality product day-in-day-out, has seen a major increase in the amount of grainfed beef being produced domestically. This study has identified that there are about twice as many cattle being grain supplemented at pasture and fed in opportunistic feedlots (varying degree of professionalism) than in being grainfed for 70 days in the major feedlots for domestic consumption.

The Australian consumer appears to have a preference for yearling beef and currently there are two differences to the Japanese grainfed yearling. Firstly, heifers are acceptable in Australia. Therefore the sisters of steers destined for the Japanese grainfed yearling market (provided they are not required as future breeders) are available for the domestic grainfed system. Importantly the heifers must be able to achieve the target growth rates and specified fat depth requirements. The second difference is that the Australian domestic grainfed slaughter weights are 200 - 220 kg as against the 240 kg weight for the Japanese yearling. It is predicted that this carcase weight will increase in order to achieve greater industry, particularly processing, efficiencies and the schematic production shown above represents the most likely future system. The supermarkets have already raised their slaughter weights.

The majority of the heifers produced for this specification will be fed for 70 days. Some of the steers, particularly those being fed for the supermarkets targeting the 260 kg carcase may have to be fed for 90 days.

Marbling is not an important criteria for the domestic market but, as is the case with the Japanese grainfed yearling, an intra-muscular fat content of 3 percent will certainly enhance consumer acceptance of this produce. Tenderness is the major selling point and if possible, slaughter should be achieved by 18 - 20 months. Care should be taken if late maturity pattern animals are being incorporated into this specification to increase growth rate on feed and yield, not to forego fat distribution. Some fat to protect the animals during processing will be desirable.

Texture needs to be closely monitored as the "wet mushy" meat, although not all that well understood in Australia by consumers, "dries out" during storage in the refrigerator and most importantly, during cooking. Therefore it is desirable not to reduce slaughter age to below 16 months.

Results of MRC project M122 "Beef sire evaluation to improve commercial competitiveness of Australian grainfed beef" indicated that milk teeth animals grow about 7.0 percent faster in the feedlot than the two teeth animals who in turn, grow about 6.5 percent faster than four teeth animals. The faster growing animals are the most efficient converters.

The domestic grainfeeding system will assist in ensuring that Australian consumers are given consistent quality beef for 365 days of the year.

The backgrounding phase in this production system is of short duration and not as critical as with the longer fed regimes.

6.3 Hastening Improvement in Competitive Supply

Two options exist:

- change the feeder cattle production systems to increase supply; and/or
- decrease demand for number of feeder cattle required to supply grainfed beef markets.

6.3.1 Change to Feeder Cattle Production System

Given that the carrying capacity of dedicated beef cattle country is fully exploited, and the competitive position of beef cattle, relative to other land-resourced enterprises does not improve, improvement in the supply of feeder cattle will necessarily come from an increased offtake from existing cattle country. While intensification through pasture improvement, fodder conservation and irrigation will continue, increase in productivity by these measures will be slow and unlikely to be big shifters by year 2000. Here we have looked at options which could conceivably impact by year 2000, and indeed options which are already beginning to be applied by industry in response to the changing signals from the beef market. The impact of four possible options (3 in the north and 1 in the south) for improving supply of calves out of breeder herds (beef and dairy) have been considered. These are:

- stratification: earlier transfer of sale cattle from the pastoral (harsh) zone to the sheep/wheat (endowed) zone in northern Australia;
- substituting grass finishing in the sheep/wheat (endowed) zone with feedlotting, that is, turning a steer off grass a year earlier in northern Australia;
- increased branding rates in northern Australia; and
- increased grainfed dairy steer numbers in southern Australia.

All these options require extra backgrounding which may substitute existing cattle enterprises. Estimates are made of production foregone using steady state herd models, with and without, the particular option. Impact of the supply options is evaluated from the physical and biological viewpoint, not from the financial viewpoint. Ultimately, whether any change takes place will be driven by an increase in sustainable profit.

Stratification

Stratification is the process whereby young sale cattle are moved off dedicated breeding properties to properties elsewhere for growing-out/backgrounding and/or finishing. It is a common practice in the north, particularly amongst corporate property owners but it is implemented with varying degrees of rigour.

In the pastoral zone of the northern supply region, there were approximately 3.662 million cattle in total in March, 1993 excluding herds supplying live export. Eighty three percent of these (3.043 million) are in the preferred supply region (see Volume 2, Appendix B, Map 1(c)) and are not high grade Brahmans. Our survey of the corporate enterprises suggests that about 14 percent of properties breed and turn off 12-24 month old cattle and about 26 percent turn off weaners less than 12 months. We estimate that the majority of the single property owner-operators would turn off 12-24 month old cattle. If one-third of this herd, that is one million head, reduced the age of turn-off by 12 months and increased the number of breeders to take up the surplus carrying capacity, the following effect on offtake would apply:

	Enterprise 12-24 month turnoff ('000)	Enterprise < 12 month turnoff ('000)`	Increased turnoff ('000)
Cows & heifers mated	569	692	+123
Cows & heifers sold	146	178	+32
Steers & bullocks transferred (sold)	169	216	+47

It might be reasonably assumed that the heifer component of this offtake would go straight to feedlots for the domestic grainfed yearling trade. On the other hand, the 47,000 steers would most likely be headed for the B2 market and therefore require backgrounding. It is likely they would be moved to the endowed region requiring an additional 38,000 AE carrying capacity. How this would be provided is problematical. Extra feed could be created (e.g. by forage cropping, sorghum silage etc) or alternatively substitution of an existing cattle enterprise may occur. Assuming the 38,000 AE fully substitutes for a breeding enterprise which produces grass finished Japanese ox, the offtake foregone would be, according to our models, approximately 6,600 Japanese ox and 6,500 cull cows and heifers.

By year 20000, an extra 72,000 B2 and B1 grainfed steers will be required under the Baseline Scenario and an extra 136,000 under the Optimistic Scenario. This option, fully implemented, would contribute 65 percent of the year 2000 requirement of B2 and B1 grainfed steers under the Baseline Scenario and 35 percent under the Optimistic Scenario.

Substitution

Substitution is defined here as the replacement of a breeding enterprise which principally targets the grassfed Japanese ox market, with a breeding enterprise which turns-off feedlot entry steers of 400 kg.

In the sheep/wheat (endowed zone) of the northern supply region there were some 3.280 million cattle comprising 1.538 females more than 1 year on 31 March, 1993. These produce annually about 500,000 male calves (Volume 2, Table 4.5) not required for bull replacements, and which are Indicus composites or Taurus. A dominant cattle enterprise in this region is to turnoff grassfed Japanese ox. One option is for these producers to switch, totally, or in part, to selling a feedlot entry steer of 400 kg liveweight which can be turned off 12 months earlier.

Price will obviously determine the choice of target market but it could make economic sense for such producers with an abundance of brigalow and downs grassland to diversify out of a totally grassfed outlet. Ideally such producers would select their better performing cattle for feedlot destination and retain the slower performing tail for grass finishing.

Turning off a draft of younger animals means that extra breeders could be carried. Our herd modelling shows that if herds totalling 320,00 head (10 percent of the 3.2 million cattle herd) changed their enterprise from producing a grass finished Japanese ox to feedlot entry steer, the following change to the herd and offtake profile would apply:

	Enterprise Jap Ox ('000)	Enterprise Feeder Steer ('000)	Change ('000)
Cows & heifers mated	144	222	+78
Cows & heifers sold	49	76	+27
Japanese ox sold	51	0	-51
Feeder steers sold	0	82	+82

This option, fully implemented, would alone contribute more (107 percent) than the Baseline Scenario requirement of B2 and B1 feeder steers required by year 2000 and 60 percent of the requirement under Optimistic Scenario.

From a national supply viewpoint, cow and cull heifer sales increase and total meat production would increase. From the producers viewpoint it may make good economic sense to diversify and target both markets. As with the stratification option, production foregone is in the turnoff of grassfed Japanese ox.

Increased Branding Rates

This option is most likely to apply to the northern supply region where branding rates are lower than in the south. In the preferred northern feedlot supply region there were 3.87 million female cattle more than 1 year on 31 March, 1993. The effective female herd size, after correction for EVAO in the ABS statistics and deducting the high grade Brahman animals, amounted to 3.89 million. An increase in branding rate of 2 percent across all production sub regions would

increase output of feeder steer calves by 36,000 and surplus heifer calves by 32,000. If all the extra steers were backgrounded in the endowed zone and sent to feedlots to produce B2/B1s, the offtake balance sheet would approximate the following:

Extra B2s or B1s ex feedlot after mortality	: 36,000
Extra surplus heifers	: 32,000
Loss of Japanese ox sales	: 4,700

Increased Grainfed Dairy Steer Numbers

In 1993, about 600,000 dairy bull calves were slaughtered in Australia. It is estimated that all but about 3 percent of these were slaughtered as trade bobby calves with an average weight of 40 kg. Of the 3 percent which were grown out, most were grass finished and a small percentage entering feedlots for grain finishing. On meat industry efficiency rounds there is a *prima facie* case to grow out more bobby calves and slaughter at heavier weights and it is postulated that grainfed dairy beef could be growth market. A number of Projects around Australia are looking at this prospect. Some industry experts are more sanguine about the opportunities. While they acknowledge that grainfed dairy beef is a developing market its development will be tempered by two factors:

- price incentives to artificially rear an animal for feedlot entry;
- growth & feed conversion rate of grainfed dairy beef.

The implication for the feedlot industry, particularly in southern Australia where the dairy industry is concentrated, is that there is a possible untapped source of feeder inputs, but this source will need commercial wooing and development.

The State where the greatest impact from the development of a dairy grainfed beef industry would be Victoria where almost 60 percent of the Australian dairy herd resides. For Victoria, the total dairy bobby calf slaughter represents about 50 percent of the supply of steer and surplus heifers coming out of beef cattle herds and, if developed, could have a significant impact on feeder supply to southern feedlots.

The logical market for grainfed dairy beef is Japan where local production from dairy steers is predicted to decline. Given that about half of the beef sold into the middle market in Japan is sourced from domestic dairy steer it is reasonable to expect the consumers to have an affinity for dairy beef. This is in fact the case and consumers do have preference for dairy beef of the B2 and B3 grade over and above US beef and the majority of Australian grainfed beef (see M075 "Sensory Analysis of Fresh Beef in Japan" in MRC sponsored Project).

The fact that there is a possible preference amongst Japanese consumers for dairy beef augers well for countries, in particular Australia, wishing to augment supply onto the expanding beef market in Japan. Significantly, 90 percent of the dairy cattle in Australia are Holsteins, the majority of which have been infused with North American blood, in particular Canadian, to improve milk yields. Similar infusions have occurred in Japan, therefore the genetic base is similar in both countries. It is reasonable to assume then, that given adequate rearing and feeding systems in Australia, that similar carcase qualities, such as yield and meat quality, in particular marbling and texture, to those achieved in Japan will be produced in Australia. Interestingly, of the dairy steer carcases graded in Japan, approximately 40 percent grade B3, that is achieve a marble score of 3 or 4 (LIPC data).

Australia can logically utilise some of the 600,000 bobby calves currently slaughtered at 3.5 days of age to assist offset any shortfall in supply. There is likely to be a larger opportunity for Australia in the B3 rather than the B2 market due to:

- The moves in the US feedlot sector to breed cattle that can be slaughtered at a younger age (16-18 months) with the consequence that these cattle show very low levels of marbling since this characteristic is maturity related and the optimum age for marbling to express itself (in relation to other tenderness and quality factors e.g. connective tissue increase, meat colour) is 24 to 28 months. It is noted that the Japanese slaughter their dairy steers at two years.

- Cost of production in Japan. It is becoming less and less viable for Japanese producers to grow dairy steers and, there is an increasing tendency for the dairy steer producer use Wagyu bulls in the hope they will achieve higher quality grades than the B3.

The great majority of these calves are located in Victoria and along the Murray Irrigation System (MRC project DAN068 "Dairy Beef for Export Markets"). Unfortunately this resource will not be all that simple to harness. The establishment of the infrastructure to assemble these calves, to rear them to grass eating age and to grow them out to feedlot entry age/weight specifications will involve significant investment. Further the feed conversion rates of the Holstein on feed have been reported as high as 14:1 which would make the exercise totally unpalatable to any prospective feedlotter. The DAN068 Validation Project is investigating this conversion issue, plus other relevant problems such as dark meat colour, odd shaped primal cuts and variability in eye area.

The new generation of feedlots located in the Riverina region of New South Wales are well situated geographically to tap this dairy calf resource. Furthermore a large percentage of these feedlots in the Riverina are targeting the B3 market. The downside still remains and that is the establishment of a cost-effective rearing system.

Summary

The impact of the three options for which offtake changes were modelled is summarised in Table 6.5

Table 6.5 SUMMARY IMPACT OF OPTIONS TO INCREASE FEEDER CATTLE SUPPLY

Option	Extra B2/B1 feeder steers ('000 head)	Extra cull cows and cull heifers ('000 head)	Loss of Japanese ox production ('000 head)
Northern stratification	47	32	7
Substitution in endowed zone	82	27	51
Increased branding by 2%	36	32	5
Total change	**165**	**91**	**63**
Extra B2/B1 steers required by 20000 under Scenarios:			
- Baseline	72		
- Optimistic	136		

From this analysis we conclude that the incremental supply of feeder steers of the B2/B1 type required Australia wide by year 2000 is achievable by the options considered. The penalty cost will be a decline in the production capacity of Japanese ox finished or quality grassland in the endowed zone but the net effect is an overall increase in beef production, not only in the B2/B1 market segment but in the market segment which would receive additional cull cows and surplus heifers which would be both the manufacturing segment and the market which will accept heifers - the domestic grainfed and Korean markets. The overall constraint to the implementation of these options is one of confidence and financial advantage perceived by the breeder to make the necessary farm activity change. This will require on-going promotion by the feedlot sector and the provision of incentives such as the provision of forward selling agreements and price incentives to the supplier. Finally, the assessment done here are based on steady state models but in reality for a breeder to sell younger cattle requires, not only the divestment of older male cattle, but the retention of more replacement heifers to enable a build-up in the size of the cow herd. The immediate post-drought period, when most properties have already unloaded older male cattle and are looking for early cash flow, could be an opportune time for the feedlot industry to pro-actively push its case.

6.3.2 Decreasing Demand for Feeder Cattle

Two options exist for decreasing feeder cattle demand:

- increased domestic slaughter weights; and
- reduction of downgrading/improved backgrounding.

Increased Domestic Slaughter Weight

Slaughter weights of domestic grainfed cattle range from 200 - 220 kg averaging 210 kgs. The major supermarket chains in Australia are actively promoting a 240 kg yearling carcase for distribution through their retail outlets. There are significant benefits to accrue to producers, feedlotters, processors and the retailers in terms of efficiencies by moving to a 240 kg grainfed carcase. Care would need to be taken to ensure that the increase in carcase weight was not achieved by simply putting on additional fat. Also, prior to the move, cryovacing, grading, improved carcase fabrication techniques and quality assurance programs need implementing. It would be important that retailers do not simply use larger traditional cuts to "dispose" of the heavier carcase. Consumers are moving toward purchasing smaller cuts of meat and selecting a wider variety of cuts for a broader spectrum of meal preparation techniques.

The increasing numbers of Asians in Australia now makes it possible to prepare the traditional low valued forequarter cuts into slices and cubes for use in Traditional Asian cuisine. The larger offcuts, shins, shanks, knuckles etc. can either be exported to Taiwan or minced for sale at retail in Australia.

In registered feedlots cattle produced for the domestic market on a > 70 day feeding regime were estimated at 390,000 head in 1994. At an average slaughter weight of 210 kg would have produced 81,900 kt pcw of beef and, 54,873 kt bone-out beef at a saleable meat yield of 67 percent. By increasing the carcase weight to the preferred supermarket requirement of 240 kg, the number of cattle required in 1994 would have been reduced by 12.5 percent to 341,250 head. In addition, if the yield was increased from 67 percent to 69 percent, the required number of cattle would have been further reduced to 331,359 head which is 15 percent lower than required at 210 kg slaughter weight and 67 percent yield. Table 6.6 refers.

Table 6.6 EFFECT OF INCREASING SLAUGHTER WEIGHT AND YIELD ON DOMESTIC SLAUGHTER NUMBERS IN REGISTERED FEEDLOTS IN 1994

	Average Slaughter Weight 210 kg in 1994	**What if average slaughter weight increased to 240 kt**
Saleable meat yield in 1994 67%	390,000 head 891.900 kt pcw 54.873 kt sm\1	341,250 head (-12.5%) 81.900 kt pcw 54.873 kt sm
What if saleable meat yield increased to 69%	378,695 head (-2.9%) 79.526 kt pcw 54.8763 kt sm	331,359 head (-15.0%) 79.526 kt pcw 54.873 kt sm

\1 sm = saleable meat being the estimated 1994 situation.

Cattle grain supplemented in unregistered opportunist feedlots destined for the domestic market amounted to 811,00 head in 1994. At an average 210 kg slaughter weight, these cattle would produce 170.31 kt pcw and 114.108 kt saleable meat at 67 percent yield. To increase the weight and yield of cattle on opportunist feedlots or supplemented at pasture would be much more difficult. Assuming the carcase weight could be increased to say 220 kg, the number of feeder cattle would have been reduced from 811,000 head to 774,136, a reduction of 4.5 percent. If increasing yield to 69 percent was possible the required number of cattle would be further reduced to 751,700 being 7.5 percent lower than required at 210 kg dressed weight and 67 percent yield. Table 6.7 refers.

Table 6.7 EFFECT OF INCREASING SLAUGHTER WEIGHT AND YIELD ON DOMESTIC SLAUGHTER NUMBERS IN OPPORTUNIST FEEDLOTS IN 1994

	Average Slaughter Weight 210 kg in 1994	**What if average slaughter weight increased to 220 kg**
Saleable meat yield in 1994 67%	811,000 head 170,310 kt pcw 114.108 kt sm\1	774,136 head (-4.5%) 170.310 kt pcw 114.108 kt sm
What if saleable meat yield increased to 69%	787,495 head (-2.9%) 165.374 kt pcw 114.108 kt sm	751,700 head (-7.3%) 165.374 kt pcw 114.108 kt sm

\1 sm = saleable meat being the estimated 1994 situation.

By year 2000 the advantage of higher slaughter weights and yield in terms of reduced demand for feeder cattle would be dramatic. The impact is summarised in Table 6.8

Table 6.8 DOMESTIC GRAINFED CATTLE REQUIREMENTS IN YEAR 200 WITH AND WITHOUT WEIGHT AND YIELD INCREASES

	Baseline Scenario		Grainfed Market Shift Scenario	
	> 70 on feed ('000)	Grain supplemented ('000 head)	> 70 days on feed ('000)	Grain supplemented ('000)
Number of slaughter cattle required at existing slaughter weights and yields	400	831	537	1116
Number of slaughter cattle required at higher slaughter weights and yields	340	773	456	1038
Reduction in number of cattle required	-60	-58	-81	-78

This analysis highlights the value of increases slaughter weights and yield in a feeder supply constrained environment and the merit of the feedlot industry facilitating the genetic development of cattle which are high yielding and develop the required fat depth at the higher target slaughter weights.

Reduction of Downgrading and Improved Backgrounding

At present it is estimated that of the cattle leaving feedlots into the B3 market, an extra 55 percent enter as feed-on steers to compensate for downgrading. For the cattle exiting as B2s an extra 35 percent need to enter as feed-on steers to compensate for the downgrading to B2s. The total number of dedicated feed-on steers required for the B2 market segment is reduced by the bonus of downgrades from B3s but notwithstanding a surplus of dedicated B2 steers is required to meet the market. As a result of the downgrades from B2 to B1, fewer dedicated B1s are required and because there is no downgrading beyond B1s, the total number of feeder cattle required for the aggregate B3+B2+B1 market remains the same regardless of the downgrading percent. The demand for feed-on steers required for the specific B3 and B2 market segments could be significantly reduced if the downgrading percent was decreased.

We have suggested that a reasonable goal would be to reduce downgrading by 20 percent, that is the B3 downgrades from 55 to 35 percent and the B2s from 35 to 15 percent. The impact of this for the Baseline in year 2000 would be as follows:

B3 feeder steers required	- 28,000 (-14%)
B2 feeder steers required	- 34,000 (-10%)
B1 feeder steers required	+ 62,000 (+32%)
Total change in feeder steers	0

This will be primarily achieved by genetic improvement in the source breeding herds and to some extent by culling in the backgrounding phase.

The advent of more specialised backgrounding operations could be expected to assist in reducing the demand for feeder steers by reducing the culling and downgrading rate in feedlots. Financial incentives for the small owner/operator in the endowed regions to specialise in backgrounding, and forego breeding, appear to be attractive particularly on a contract basis where the cattle are owned by the feedlotter. In the southern region it has been suggested that returns on investment from backgrounding enterprises could be 14 to 20 percent compared to modern breeding returns of 6 to 7 percent.

Interviewed corporate cattle breeders in the northern supply region with their breeding activity focused in the pastoral zone are targeting the grainfed market to varying degrees. Those seriously targeting the grainfed market have acquired backgrounding properties with high feed security close to the feedlot belt. Some have put in a feedlot and switched, in part, from grass finishing to grain finishing and taken up the grass finishing carrying capacity with breeders but with backgrounding still in the low feed security pastoral zone.

There is commercial advantage to the feedlot sector to promote the concept of backgrounding to regulate the flow and preselect cattle for feedlot entry. Adequate premiums for well backgrounded cattle meeting rigorous feedlot entry specifications will be the main drive to the future development of this activity in the cattle supply chain. Where ownership changes hands at the feedlot gate, it is important for the feedlotter to offer feedback on carcase performance to the backgrounder/supplier if a culture of commercially driven genetic improvement of cattle is to develop to the mutual benefit of the feedlotter and the supplier.

7. GRAIN SUPPLY

7.1 Regional Grain Production in Major Feedlot Areas

Feedlots have been developed in areas where they have good access to supplies of cattle, feed and processing facilities and where the climate allows high productivity. In response to these considerations, the three major commercial feedlot regions that have developed in eastern Australia are located in:

- the Darling Downs in Queensland,
- the wheat sheep zone of the North West Slopes of Northern New South Wales, and
- the Murrumbidgee/Riverina area of southern New South Wales.

The feedlots in these three regions turn off more than 80 percent of all cattle held on intensive feed for more than 70 days. Based on the results of the May 1994 AMLC/ALFA survey of feedlots with capacities of greater than 500 head, the distribution of feedlot capacity by states is as indicated below. There is no information available on the distribution of opportunity feedlots.

State	Share of Feedlot Capacity in May 1994 (AMLC/ALFA Survey results)	Share of Feedgrain Production (Average Sorghum plus barley production 1987 - 1992)
Queensland	47.8	21%
NSW	34.5	21%
Victoria	8.3	14%
SA		29%
WA	7.4	14%
Other	2.0	

As discussed below, this allocation of capacity does not match grain supply and has led to increasing regional imbalance in grain availability.

7.1.1 Queensland - Darling Downs

The large majority of feedlots in Queensland are located on the Darling Downs and this region is responsible for the production of 72% of Queensland's feedgrains (see Appendix A Table 35 of Volume 2). On average over the six years to 1992/93, the Darling Downs have produced 752 kt of sorghum and barley, the major feedgrains used by feedlots. Seasonal variability has been high with

the lowest production (sorghum plus barley) being 450 kt in 1992/93 and the highest 1,022 kt in 1987/88. As discussed below, we estimate that the current feedlot capacity for Queensland requires access to around 720 kt of feedgrains annually. Clearly this supply has not been available in all years as dramatically indicated in the current drought.

The production of major feed grains on the Darling Downs, for the seven year period up till 31 March 1993, shows the wide annual variations brought about by the recent droughts. Wheat production on the Downs has ranged from in excess of 1,000 kt in 1990/91 to as low as 185 kt the following year with production only exceeding 500 kt on two occasions in the seven year period. Volume 2, Appendix A, Table 35 refers.

Grain sorghum has shown a similar variation ranging from 801 kt in 1987/88 down to 187 kt in 1992/93. The harvest has only been in excess of 500 kt in four of these seven years.

Barley production has varied from 325 kt in 1988/89 to 57 kt in 1991/92. It has only been in excess of 300 kt on two occasions. Now that there are better high yielding varieties of barley available, when seasons return to normal they could be expected to perform well in the Western Darling Downs.

Other feed grain crops (such as oats, triticale and maize) together seldom exceed a total of 90 kt with maize for human consumption being the most important of these. More recently other high value summer crops (including dryland cotton, sunflowers and soybean) have competed particularly with sorghum for the limited cropping land resource.

7.1.2 NSW - Northern

In northern New South Wales feedlots are located from Quirindi to the Queensland border - the majority of these commercial operations being near the border of the northern statistical division. Over the six years to 1992/93, this region produced an average of 464 kt of feedgrains comprising 220 kt of barley and 244 kt sorghum. This represents about 42% of the NSW total feedgrains production (barley plus sorghum). This local production of feedgrain is in excess of the local feedlot requirements and hence regional grain shortages are unlikely except in the worst drought years.

The Northern NSW region has been less drought affected than the Darling Downs but it has experienced major changes in cropping patterns. During the last seven year period the area sown to wheat has reduced by some 45 percent with a 40 percent drop in wheat production in 1992/93. At the same time barley production increased by some 52 percent to 245 kt with an increase in sown area from 95,000 ha to 138,000 ha (45 percent). Sorghum production during this period has gradually fallen, except following the dry winter of 1991 when the area sown to sorghum increased by 82 percent from the previous year as farmers attempted to recover crop income following the

failure of the winter wheat crop. In normal years it would be expected that competition from other summer crops with their potential to provide high operating returns will result in lower sorghum production.

7.1.3 NSW - Southern

In southern New South Wales major new feedlots are being constructed in central western Riverina in close proximity to reliable sources of irrigation water which is being used to provide a sizeable proportion of feed requirements particularly silage for the roughage component of the ration. The majority of these feedlots are in the Murrumbidgee statistical division where the larger feedlot operations are investing in their own slaughter and processing facilities.

Southern NSW is a major grain producing region and the feedlots in the region can also draw feedgrains from Victoria and South Australia. The Riverina/Murrumbidgee region within southern NSW is only a relatively minor grain producing area but it has averaged 201 kt of feedgrains (barley 196 and sorghum 5 kt) over the past six years. This is equivalent to 18% of NSW average feedgrain production. Hence feedlots in southern NSW have not faced grain shortages in the past, and are not likely to do so in the future, given the large volumes of grain produced within reasonable distances of feedlots.

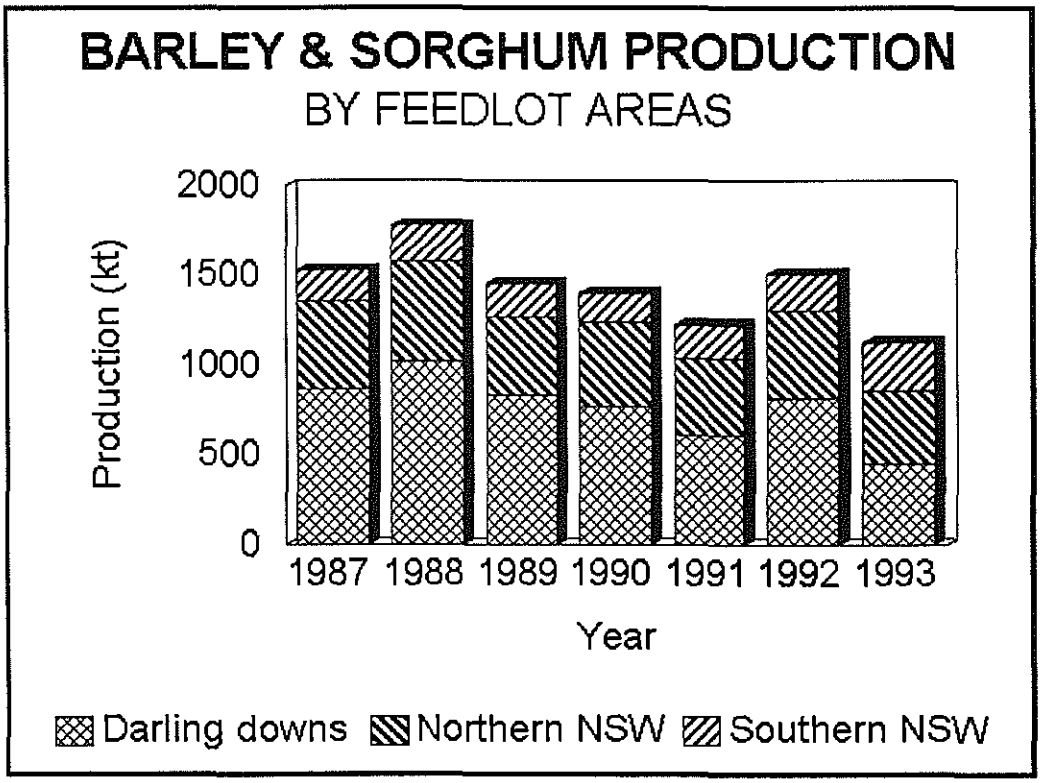
Volume 2, Appendix A, Table 35 sets out grain production for Murrumbidgee region over seven years. Here the area sown to wheat has declined by some 46 percent to 285,000 ha while the area sown to barley has increased by 24 percent to 127,000 ha. Other winter crops particularly oats and triticale play a more significant role in this predominantly winter rainfall area and in 1992/93 yielded 213 kt and 63 kt respectively. Rice is the major summer crop but in recent years maize production has increased to some 50 kt of which a small amount is used in the stock feed industries.

7.1.4 All Regions

The production of the two major grains used in the feedlot industry (ie barley and sorghum) have been plotted for the three feedlot areas (Chart 7.1). Total grain production of both has not shown a significant increase despite the large build-up of cattle on feed in these areas. The drought on the Downs and to a lesser extent in northern New South Wales may have contributed to this situation but competition from other more profitable crops has also been a major factor. On the Darling Downs additional feedlot grain supplies, predominantly barley has been brought in originally from northern New South Wales and over the last two years from as far away as South Australia. With the present severe drought conditions in Queensland and New South Wales both northern feedlot regions must continue to import grain in the short-term.

In addition to barley and sorghum which are the preferred feedgrains for feedlots, maize, oats and wheat can be used as feedgrains. Downgraded wheat due mainly to weather damage at harvesst time is often purchased at competitive prices with other cereal. Analysis of Australia's production of the full range of feedgrains (as indicated in Volume 2, Appendix A, Table 34) reveals that production of feedgrains has been declining over the past six years. While to a large extent this has been related to poor seasons, particularly in northern Australia, it also reflects a shift to other more profitable crops and alternative enterprises.

Chart 7.1



Source: ABS Statistics.

7.2 Feed Requirements of the Cattle Feedlot Industry

For the eight grainfed market segments considered in this study, total feed requirements were calculated based on the production parameters shown in Table 7.1

Table 7.1 PRODUCTION COEFFICIENTS USED TO CALCULATE GRAIN AND ROUGHAGE REQUIREMENTS FOR GRAINFED CATTLE BY MARKET SEGMENT

Market Segment	L/wgt in (kg)	L/wgt out (kg)	Days on feed	Total l/wgt gain (kg)	Avg. daily gain (kg)	Feed Requirements (kg DM basis)		Grain/ Roughage
						Per kg lwg	Total per head	
Japanese B3	400	700	230	300	1.30	9.00	2700	60/40
Japanese B2	450	680	150	230	1.53	7.75	1783	70/30
Japanese B1	450	630	100	180	1.60	6.50	1170	80/20
Japanese yearling	310	450	100	140	1.40	6.25	875	75/25
Korean K1	350	510	100	160	1.60	6.75	1080	80/20
Korean fullset	450	630	100	180	1.60	6.75	1215	80/20
Domestic > 70 dys	330	430	70	100	1.43	6.00	600	75/25
Domestic supp.	340	430	90	90	1.00	6.00	540	60/40

Grain and roughage requirements for the base year 1994, were determined from the estimated breakdown of cattle on feed (Volume 2, Appendix A, Table 1) and is shown in Table 7.2.

Table 7.2 FEED REQUIREMENTS FOR GRAINFED CATTLE IN AUSTRALIA IN 1994

Market Segment	Number of cattle entry feedlots ('000 hd)	Feed Requirements (as fed)		
		Total (kt)	Grain (kt) \1	Roughage (kt) \1
Japanese B3	174	548	313	235
Japanese B2	287	590	398	192
Japanese B1	162	216	168	47
Japanese yearling	110	110	80	30
Korean K1	50	61	48	14
Korean fullset	6	8	6	2
Domestic > 70 dys	394	271	197	74
Domestic supplemented	819	516	295	221
Total	**2,002**	**2,320**	**1,506**	**815**

\1 Assume average dry matter of 90% for grain and 80% for roughage

Grain and roughage requirements by Scenario for 1994 and year 2000 is shown in Table 7.3.

Table 7.3 SUMMARY OF GRAIN AND ROUGHAGE REQUIREMENTS BY SCENARIO

Scenario	Number of Cattle Grainfed		Grain Requirements \1		Roughage Requirements \1	
	1994	2000	1994	2000	1994	2000
	('000)	('000)	(kt)	(kt)	(kt)	(kt)
Baseline	2,001	2,192	1,506	1,713	814	914
Optimistic	2,001	2,282	1,506	1,849	814	983
Pessimistic	2,001	2,190	1,506	1,689	814	904
FMD Free South America	2,001	2,211	1,506	1,737	814	930
High Wool Price	2,001	2,185	1,506	1,713	814	916
Grainfed Productivity Increase	2,001	2,598	1,506	2,235	814	1,181
Japaness Dairy Beef Decline	2,001	2,212	1,506	1,751	814	936
Market Segment Shift	2,001	2,648	1,506	1,925	814	1,049

\1 As fed basis - assumes average dry matter of 90% for grain and 80% for roughage

7.3 Competition for Feeds from Other Livestock Industries

The poultry, pig and dairy industry compete with the beef feedlot industry for feed resources. Table 7.4 sets out estimates of annual feed usage by the four major intensive livestock industries for 1994 breaking these feeds into grains and concentrates. The four industries are estimated to require in total 5453 kt of grain in 1994 with beef feedlots requiring some 28 percent.

Table 7.4 COMPETITION FOR FEED GRAINS ESTIMATED 1994 FEED USAGE BY MAJOR AUSTRALIAN LIVESTOCK INDUSTRIES

	Industry	Grain (kt)	Concentrates (kt)	Total (kt)	Grain %
1.	POULTRY\1				
	Chicken Meat	1,072	460	1,532	
	Commercial Layers	305	187	493	
	Backyard	39	10	49	
	Sub Total	1,416	657	2,074	26%
2.	PIG	1,356	339	1,695	24%
3.	DAIRY INDUSTRY	1,175	294	1,469	22%
4.	BEEF FEEDLOT\2	1,506	815\3	2,320	28%
	TOTAL\4 \5	**5,453**	**1,949**	**7,327**	**100%**

\1 Figures compiled by Vivien Kite - Stockfeed Manufacturer Association
\2 Taken from study figures.
\3 This includes roughage requirements
\4 Domestic Animal including horses not calculated
\5 On-Farm Supplementation of sheep not included.

The poultry industry is estimated to require some 1,416 kt of grain in 1994, where wheat and sorghum are normally the main grains of preference along with meat and bone meal as the major concentrates. This varies somewhat from state to state with oats and lupins becoming part of the rations in the southern States.

Poultry meat production over the last two years has increased by about 4.0% per annum to 492,000 tonnes and in the medium term production is expected to grow by 2.5 - 3 percent annually and to reach 560,000 tonnes in 1998/99, requiring 1,610 kt of grain by 1998.

The pig industry is also prepared to use a high proportion of wheat in rations so that any downgraded wheat coming on the market at competitive prices with other grains normally finds its way into pig and poultry rations.

Pig meat production, over the last two years, has actually fallen by around 3 percent to 326,000 tonnes but is projected to increase by 1.2 percent per annum over the next five years resulting in pig meat production increasing to 346,000. The additional demand for grain in the pig industry is expected to be around this 6 percent by year 2000, or 1,440 kt. This does not take into account the possibility that an export industry could open up in South East Asia. Already we are informed that the development of a very large intensive piggery is proposed for the Darling Downs. Such development could be repeated in Western Australia and the Southern States, should this market develop.

Rationalisation in the dairy industry during the mid to late 1980's has resulted in fewer cows producing significantly more milk per lactation due mainly to better feeding and this includes regular crushed grain and protein meal supplementation. Whereas in the past the dairy industry relied almost solely on pasture feeding for most of its production, it now uses an estimated 1,175 kt of grain with scope for further expansion. This degree of feeding is expected to continue and even rise further as expected yield per cow per lactation reaches over 5,000 litres in 1998/99.

Barley has also become the preferred grain of the dairy industry and the large demand in the Victorian industry has come from the increased production in the Mallee and Wimmera. Most dairies have invested in feed storage facilities and are in the position of being able to acquire a sizeable proportion of their annual requirements at harvest time. Despite the fact that most of the farms are situated away from the grain areas and the feedlots, they will come directly in competition with them for barley and other grain supplies.

Over the next five years annual production of milk is projected to increase by a total of 9 percent to 8,500 million litres while cow numbers are expected to rise by only 3,000 or less than 1 percent. Most of this increased production would be as a result of better feeding practices in which grain and protein meal supplementation will play a most important role.

Future demand for feedgrain by all competing livestock industries by 2000 will increase. Table 7.5 refers.

Table 7.5 GRAIN REQUIREMENTS OF ALL LIVESTOCK INDUSTRIES 1994 & 2000

Industry	1994 kt	1994 - 2000 Increase %	2000 kt	Year 2000 % of Total
Poultry	1,416	13.7	1,610	27
Pigs	1,356	6.1	1,440	24
Dairy	1,175	8.9	1,280	21
Beef Feedlot[1]	1,506	13.7	1,713	28
TOTAL	**5,453**	**10.8**	**6,043**	**100**

[1] Baseline scenario

For all livestock industries feedgrain requirements is projected to increase by 10.8% to 6.04 million tonnes by 2000 with each taking its share of the market.

7.4 Feedgrain use in the Extensive Livestock Industries

Feedgrains are used by cattle and sheep producers both as a means of dealing with seasonal feed shortages and droughts and as a means of finishing stock. The quantities involved are not reported and they vary considerably with seasonal conditions. In times of drought very large volumes of feedgrain are diverted to the extensive livestock industries.

There is also a large number of grassfed cattle that are being supplemented with grain while still at pasture. We estimate that as much as 50,000 tonnes of beef entering the Japanese market as grassfed beef is, in fact grain supplemented. This is equivalent to 249,000 head of cattle.[10] Our estimates are that these cattle would require on average around 560 kg/head generating an additional demand for 139 kt of grain.

The feedgrains used by the extensive industries constitute an additional demand which has not been assessed. The drought feeding requirements are highly variable and their assessment is beyond the mandate for this study. However, we believe that the use of feedgrain by the extensive livestock

[10] Based on a yield of 67% giving a production carcase weight of 74,626 tonnes and an average "grassfed" carcase weight of 300 kg requiring 248,753 head.

industries constitutes a large and important additional demand on feedgrains in Australia and should be assessed.

7.5 Feedgrain Supply and Demand Balance

The market for Australian feedgrains has changed dramatically over the past decade with the growth of domestic demand coming on top of steady export demand. Australian production of feedgrains including barley, sorghum, oats, triticale and maize is projected (ABARE) to average around 8,500 to 9,000 kt in the period to 2000. There is an additional supply available from downgraded wheat which is used in preference by the poultry industry and to a lesser extent by the pig industry. Exports are projected to be around 3,500 kt leaving a balance of 5,000 to 5,500 kt to meet domestic demand. Australian feedgrain users will need to compete with export markets to secure supplies.

Depending on the extent to which wheat is used as a stockfeed, the projected supply of feedgrains is reasonably balanced with projected demand. The amount of downgraded wheat avaialble to the animal industries in most years varies from 1,000 - 2,000 kt. If it is assumed that the pig and poultry industries use 1,000 kt of wheat, the remaining demand for feedgrains, say 5,000 kt is manageable within the expected level of supply. However, seasonal factors can and will dramatically upset this balance. In addition, as indicated below, there are likely to be regional shortages.

7.6 Implications for the Feedlot Industry

From the analysis carried out under the study it is apparent that feedlotters will account for at least one third of the increased demand for feedgrains in Australia in the period up to 2000. By 2000, the feedlot industry will be the largest single user of feedgrains in Australia. The magnitude of the demand coupled with the relatively tight supply/demand balance will mean that the feedlot industry will need to make greater efforts to secure its supplies. It is also likely that feedgrain users will need to pay more for their supplies. Over the period to 2000 the real price of feedgrains are projected to rise around 10% (World Bank) or by 12% (ABARE) as indicated in Volume 2, Appendix A, Table 27. After 2000, it is projected that prices will return to present (pre-drought) levels. In summary, given average seasons, feedgrain will be available in Australia but somewhat more expensive.

The current drought has highlighted the vulnerable position of the feedlot industry in regards to grain supplies. Since it will never be possible to avoid grain shortages in severe droughts it is in the interests of the feedlot industry to seek to establish appropriate arrangements to permit the importation of feedgrains in severe droughts. In addition, however, we suggest that it is in the

interests of both the feedgrain users and feedgrain producers to recognise that they have shared interests.

At first consideration it might appear that there were no shared interests—feedgrain producers would want to sell large volumes at high prices and feedgrain users would want to use the smallest volumes possible at the lowest prices. If the feedgrains industry were characterised by a large export surplus (as is the case for wheat) it is likely that the degree of shared interests would be low. In this instance domestic prices would be driven from export prices and farm gate prices for feedgrains would be little affected by volumes sold on the domestic market.

However, this is not the case for the feedgrains industry. Exports represent a relatively low and declining proportion of production. While exacerbated by the current severe drought, some production regions have already moved to a feedgrain deficit, requiring importation (eg. from other regions) on a relatively frequent basis.

One response to a regional feed deficit is to import feedgrain from overseas but for various reasons this practice is not well established. Large imports are likely this year, but costs associated with importation (eg. phytosanitary controls and monitoring, bulk handling, etc.) are likely to be substantial. If importation remains episodic such costs are likely to remain high.

In this situation the price of feedgrains in Australia cannot be assumed to follow international prices. Rather they will fluctuate in a band between the international (export) price equivalent (in years of heavy supply) and the international price plus the cost of importing (in years of low supply). This effect is well illustrated by developments over the last year. Prices for feed barley in southern Australia have risen very substantially (eg. price paid delivered on-farm in Victoria has jumped from less than $100 per tonne to over $200) and independently of international prices for feedgrains.

Under this scenario, feedgrain users in Australia can not content themselves with the view that they will necessarily have access to feedgrains at prices equivalent to their overseas competitors. On the other side of the ledger, on average, farm gate returns for feedgrains producers will not always follow world prices exactly but will be affected by the volume of domestic market sales.

In this environment, the livestock and grains industries have shared interests in maximising the efficiency of grain production, delivery and use in Australia.

8. INPUT STRATEGIES FOR THE FEEDLOT INDUSTRY

8.1 Introduction

This section uses the information and insights gained during the study to formulate strategies that will help the feedlot industry compete more effectively internationally and domestically. Although the focus is on the feedlot industry, it is our view that these strategies will also provide clear benefits for all sections of the beef industry in Australia. This situation arises because the feedlot industry has now grown to the stage where it is driving change elsewhere in the beef industry and a failure to recognise and respond to its needs and the opportunities it provides will leave all sectors of the industry worse off. ALFA and the Cattle Council of Australia will need to communicate this view clearly to their constituents.

We begin by reviewing where the industry is now in the form of a synopsis of key points raised elsewhere in the report. We then consider what we believe are the likely changes in the environment in which the feedlots will be operating with particular reference to input supplies. In particular, we draw on the results of the various scenarios analysed in this study. In addition, to the extent that we are able, we also identify other external changes that are likely to affect the environment for Australian feedlotters over the next five to ten years. We use the synopsis and the analysis of likely change to identify the changes needed in the feedlot industry. In the last part, we present recommended strategies to bring about these changes.

8.2 Industry Situation—A Synopsis

8.2.1 Industry Structure

The feedlot industry in Australia has two distinct sectors—the formal sector represented by the major feedlots (over 500 head) and an informal or opportunity sector comprising smaller feedlots often integrated with grain production as a farm enterprise. In terms of animal numbers, the formal sector with 1.18 million head turnoff supports 59% of the estimated 2.0 million fed cattle in Australia. It probably accounts for a larger share of total grainfed beef production, however, no data are available to accurately estimate shares of the two sectors.

The informal or opportunity feedlot sector has not been surveyed and its size and performance is largely unknown. It supplies both the domestic and overseas markets directly but it also supplies the formal feedlot sector with its unfinished cattle. It includes opportunity feedlots which have been established on many mixed grain and cattle farms and also the very many farms where cattle are supplemented with grain at pasture. Despite its apparent size, very little is known about its operations, performance or profitability. The feedlots in this informal sector compete with the formal sector for access to inputs.

Given the size and importance of the opportunity feedlot sector, it is critically important that this sector be surveyed and its performance analysed to maximise efficiency of the total beef industry.

8.2.2 The Drivers for Rapid Growth

Both sectors of the feedlot industry have grown very rapidly in response to two major changes in the demand for beef. The first and dominant change has been the liberalisation of the market in Japan and the second has been the move to domestic consumption of grainfed or grain-finished beef as a means of improving consumer satisfaction with beef. At present, the Japanese market accounts for about 62% (733,000 cattle out of the estimated total of 1,183,000) of the turnoff of the formal lotfed cattle sector in Australia. The domestic market for cattle that are fed at least 70 days accounts for a further 33% (394,000 hd). The remaining 56,000 cattle of the 1.18 million cattle that are turned off from the formal feedlot sector are directed to the small but growing market in Korea.

8.2.3 Continuing Growth in Grassfed Production

The growth in feedlotting in Australia has not been at the expense of growth in grassfed cattle production but largely in addition to it. However, an increasing number of grassfed cattle are also partly grain-finished, particularly under poor seasonal conditions. We estimate that some 249,000 head of cattle are in this category at present. Feedlotting has provided the opportunity for greater specialisation in beef production in Australia and this has itself generated significant changes in the beef production systems throughout the extensive northern areas and the higher rainfall areas of southern Australia. The markets are clearly differentiated in their requirements and those supplied by the feedlot industry could not be supplied by grassfed beef producers either from Australia or elsewhere.

In addition, under adverse conditions such as those now experienced over most of the continent, feedlots have provided outlets for cattle that might otherwise have been unsaleable. As a example, feedlots currently have more than doubled their proportion of output that is directed to supplying the domestic market and in NSW more than one quarter of beef is now sourced from feedlots.

8.2.4 Steady Growth Has Been Accommodated

Despite the very rapid expansion of grain feeding, there have not been serious shortages of cattle or feed inputs. Although there have been regional shortages, these have been accommodated by grain and cattle importations from other regions. This has been particularly true for Queensland where a relatively long run of poor seasons in northern Australia followed by the current drought has led to serious grain shortages.

Although the feedlots have been able to source sufficient cattle to meet their requirements without major difficulties and without marked rises in feeder cattle prices, there are signs that the growth of

some market segments will become constrained by availability of suitable cattle if growth continues at current levels. In particular, even at current demand levels for the Japanese B3 type cattle, some 50% of all the available supplies of steer calves from cattle suitable for this market are required to meet demand.

Although the industry may be meeting demand and supplying sufficient numbers of cattle, many of these cattle are not performing as well as expected and there are considerable losses through downgradings. Whilst such inefficiencies have been absorbed in the past, growing competition in the global markets will make it essential that overall performance is improved so that Australia can maintain a competitive edge.

One of the key factors that has helped the feedlots meet demand has been the steady increase in carcase weights over the past five years. The feedlots have in fact helped this trend by providing consumers with tender meat from heavier carcases whereas in the past consumers had relied on the fact that the meat came from young animals (with inevitably lighter carcases) as their best assurance of tenderness.

8.2.5 Three Major Feedlotting Areas Have Developed

The largest concentration of feedlots has been in the southern Queensland (Darling Downs) which has a capacity of around 259,000 head or about 48% of the May 1994 total capacity of 541,000 head. (This is based on the ALFA Survey and only includes feedlots with a capacity in excess of 500 head).

NSW has two major feedlotting regions—the Northern Slopes and the Riverina—with a combined capacity of around 187,000 head or 35% of the total. The feedlots of the Northern Slopes tend to be supplied with cattle from the surrounding area and from Queensland. The feedlots of the Riverina tend to be supplied from the surrounding area and from elsewhere in NSW, Victoria and South Australia. Victoria has a capacity of around 45,000 and there is only a small formal feedlot industry in WA at this stage with a capacity of around 40,000 head.

8.2.6 Feedlot Utilisation Has Been Reasonable

Feedlot capacity has expanded at almost 50,000 head per year since 1990 but the expansion has tended to remain in line with market demands and levels of utilisation have remained reasonably high. According to the ALFA Survey of September 1994 utilisation was around 69%, down somewhat on the average of 77% since 1990. Based on our breakdown of feedlot occupancy by target markets which takes into account variations in time on feed, we estimate that utilisation will be around 73% for 1994 overall.

8.2.7 Feedlots Have Provided Strong Markets for Grain and Fodder Supplies

Feedlots now require about 1,510 kt of feedgrains annually which represents about 28% of the estimated 5,450 kt of feedgrains used in Australia by all livestock industries at present. At the same time that the feedlot industry has been growing rapidly, the dairy industry has moved towards greater use of grain supplements and concentrates with the result that feedgrain demand for the dairy industry has also increased and is now around 1,180 kt annually. The relatively rapid development of the feedlot industry and the greater use of feedgrains in dairying has virtually doubled the domestic demand for feedgrains in Australia over the past ten years.

Whilst in normal seasons this demand has been easily absorbed, there are emerging signs of regional shortages and there is insufficient capacity to cater for demands under extreme drought conditions as experienced currently. In addition, whereas in the past the domestic demand for feedgrains was approximately equal to export demand for feedgrains, this is no longer the case. Domestic demand of around 5,450 kt compares with exports of around 3,500 kt and hence the feedlot (and other grain users) are moving into a new role as price makers rather than price takers.
In addition to the demand for feedgrains, the feedlots have generated new demands for fodder including hay and silage. This demand is relatively more easily met in southern areas than in northern areas but in normal seasons it has presented no serious problem.

8.2.8 Growing Competition in Major Global Markets

Australian feedlots have a narrow market focus with only two international markets. In both those markets they are meeting strong and growing competition from US exporters who are operating with the benefits of a much larger domestic market providing scope for economies of scale and potentially stronger political support in the context of trade liberalisation. In addition, as a result of the current stage of the cattle cycle and domestic consumption patterns in the US, exporters are likely to have access to considerable volumes of grainfed beef for export over the next two to five years. The length of the period for which there will be intense competition with US suppliers will depend on the rate of improvement in beef consumption in the US which will be largely driven by economic factors and the period for which the US is able to produce above average maize crops which have kept feeding costs low for the past few years.

Owing to the greater size of the US feedlot industry and the stronger trading relationships that the US has with the markets of Japan and Korea, the US tends to be the price maker in those markets. In contrast, Australian exporters find themselves to be relatively weak sellers and largely price takers.

8.3 Likely Changes in the Operating Environment

8.3.1 Changes in Industry in Australia

There will be continuing changes in the feedlot industry in Australia as it adjusts to changing circumstances and continues to grow. Four of the important drivers of change in the industry are outlined below.

Maturing Industry

Whereas up to this point the feedlot industry in Australia has been very much in a growth phase, it is now entering a mature phase. In this new phase emphasis will need to shift to improved efficiency and cost (or value) leadership. One element of this new phase is likely to be some re-alignment of ownership and a probable concentration of ownership for those operators with better access to distribution channels through foreign equity participation or other means. This will also open opportunities for new equity partners from the growing markets such as Korea. This should not be regarded as detrimental or something to be opposed provided it is shown to be the most effective way to improve overall efficiency and move to cost and value leadership. The goal should be to ensure that the level of competition is sufficient to provide this cost leadership while still providing equitable returns to all sectors of the industry.

Another element of this phase is likely to be some rationalisation of the informal opportunistic feedlot sector assuming that it is unable to match the total efficiency of the formal feedlot sector. The nature of this rationalisation will be to remove the least efficient operators and to improve the overall quality of the products produced while reducing the costs of production. It is possible that some of this sector would shift into backgrounding operations with a net improvement in overall industry efficiency.

Rationalisation of Capacity

Based on the demand projections used for this study and our estimates of current feedlot capacity (662,000 head), we estimate that the additional capacity required by 2000 would be between 100,000 and 150,000 to bring total capacity up to 750,000 to 800,000 head. It appears that the currently planned expansion (540,000 head) in feedlot capacity will be more than sufficient to meet demand over the next decade. The present capacity provides a safety margin of around 7% (i.e. capacity is about 7% greater than requirements using the figure of 80% as the utilisation target used feedlot operators). The projected future safety margin would increase to 72% by 2000 if industry proceeded with planned expansion.

Clearly industry would not construct additional capacity if it were not needed and we expect that there will be a rationalisation of future industry expansion plans. The extent of the rationalisation

needed will depend on the share of total production that is grainfed and on the rate of rationalisation of the informal or opportunity feedlot sector. There is likely to be some contraction of the grain-finishing of grassfed cattle and their transfer into the formal feedlot sector. We suggest that if this contraction takes place, it would justify a further expansion of around 60,000 to 70,000 head by 2000 to bring capacity requirements of the formal sector to around 810,000 to 920,000 head.

Industrial Efficiency

A major determinant of the longer term competitiveness of the feedlot industry in Australia will be the extent to which industrial efficiency can be improved in the meat processing industry. The meat processing industry has a particularly poor record in industrial productivity improvement and the general trend has been for labour costs to increase more rapidly than productivity. If this trend continues Australia will find it increasingly difficult to compete on the world markets. In order to address this trend it will be necessary for the meat processing industry organisations to take a stronger and more coordinated approach to wage negotiation.

Residue Testing

The Australian meat industry in general and the feedlot industry in particular appears to be highly vulnerable to often inaccurate reporting of residue problems in meat. The highly public treatment of residue testing and the apparent readiness of the testing authorities to disclose information on contamination incidents places the industry in a relatively unfavourable position in comparison with the approach of its competitors. The industry organisations need to lobby for a more "in-house" approach to any residue problem or to consider taking over this function itself.

8.3.2 Changes in International Markets

The next 5-10 years will see further changes in the international markets but the most important features will be the slowdown in the rate of market liberalisation and the entry of new suppliers.

Market Liberalisation

Although the process of liberalisation of the Japanese market will continue over the study period, the largest changes in this market are now complete and the major focus in that market in the future will turn to securing market share in competition with the US suppliers.

Attention will move to the liberalisation of other North Asian markets, particularly South Korea but also China. This will raise new challenges for Australian industry at the enterprise level to establish appropriate linkages and strategic alliances that will provide defensible market share as these markets open. It will also present challenges for the industry associations since it is likely that efforts to

enhance Australia's competitive position in these newer markets will require coordinated industry responses and even investment in distribution infrastructure. The industry in Australia will need to work co-operatively to bring about a proactive, industry-wide change that will encourage the formation of stronger linkages and alliances.

There is some risk that these new challenges will be under-estimated and under-resourced while industry and negotiators focus on securing the most benefit out of the existing markets.

New Entrants

Over the next decade Australia is likely to have to compete with new entrants in the North Asian markets. These may include the South American countries as they progressively bring FMD under control, the European Community if it chooses to abandon the Andreissen Assurances, and China and other Asian countries if they choose to channel their considerable feedgrain surpluses into feedlots using imported and domestic feeder cattle. Australia will need to formulate strategies to make it harder for these new entrants to take market share from the existing operators or, perhaps as importantly, to make sure that the Australian industry is able to participate in the growth perhaps through the supply of inputs to offshore feedlots.

In each case Australia has a brief period, a window of opportunity, to cement its relationships with the distributors and consumers so as to resist the entry of new suppliers.

8.3.3 Changes in Input Requirements

Cattle Requirements: Total Numbers

Based on the global supply and demand analysis carried out in this study, depending on which scenario most closely anticipates actual outcomes, Australia will be slaughtering somewhere between 9.0 and 9.6 million cattle by 2000 and somewhere between 9.5 and 10.5 million by 2005. This represents an increase of somewhere between 820,000 (10%) and 1.36 million (16%) over the next six years and 1.28 million and 2.23 million over the 11 years to 2005.

This increase could come either from a national herd of current size with improved productivity or from a larger national herd. Given the need to generally improve competitiveness and the pressure to use land more efficiently, it is likely that the major change will be towards improved productivity.

Improvements in the productivity of the national beef cattle herd can come about through two avenues: changes in the structure of the total beef industry through specialisation; and changes in herd productivity through enhanced biological and managerial efficiency. One of the major benefits of the growth of the feedlot sector is that it makes it possible for Australia to use its land resources

more efficiently. Through use of feedlots, beef production can be expanded while using less land for grazing.

The total number of cattle (grass and grainfed) needed to meet the projected demand for Australian beef is indicated below in Table 8.1.

Table 8.1 Total Cattle Required to Meet Demand for Australian Beef (Thousand head) \1

	1994	2000	2005	Change 1994 - 2000	Change 1994 - 2005
- Baseline	8262	9333	10098	1071	1836
- Optimistic	8262	9621	10495	1359	2233
- Market Shifts	8262	9285	10,035	1023	1773
- Pessimistic	8262	9081	9545	819	1283

\1 Feedlot entry for grainfed and abattoir entry for grassfed

One of the key determinants of the total number of cattle required is the share between grassfed and grainfed. Under the Baseline scenario 77 percent of the total cattle killed in 2000 would be grass-finished. Under the Market Shift scenario, the grass-finished share falls to 71 percent.

Cattle Requirements: Overall Grainfed Cattle Numbers

When attention is focused on the more specific requirements of the grainfed sector, the numerical cattle requirements are considerably more modest. As indicated in Table 8.2, Australia will be slaughtering somewhere between 2.2 and 2.6 million grainfed cattle by 2000 and somewhere between 2.2 and 2.8 million by 2005. This represents an increase of somewhere between 184,000 (9%) and 647,000 (32%) over the next six years and 202,000 (10%) and 825,000 (41%) over the 11 years to 2005. Provided that the feedlot industry is offering prices for feeder cattle that are competitive with other market opportunities, there is unlikely to be any numerical shortage of feeder cattle.

Table 8.2 Cattle Required to Meet Demand for Australian Grainfed Beef (Thousand head Grainfed Feedlot Entry)

	1994	2000	2005	Change 1994 - 2000	Change 1994 - 2005
- Baseline	2001	2192	2286	191	285
- Optimistic	2001	2282	2376	281	375
- Market Shifts	2001	2648	2826	647	825
- Pessimistic	2001	2190	2203	189	202

Cattle Requirements: Grainfed Cattle Numbers for Particular Markets

While the total numbers of cattle needed to supply the feedlots are likely to be readily available, there are two separate issues concerning the specific types of feeder cattle required to meet specific market opportunities.

- Depending on the strategies pursued in targeting specific markets, it is likely that access to the higher value Japanese B3 market will be constrained by the number of cattle available that are suited to that market.

- Unless something is done to improve the efficiency of the total beef industry in Australia, it is likely that Australia's market share in the highly competitive North Asian markets will be constrained by the limited numbers of cattle that can be efficiently grainfed to deliver a product that can compete with the US product over the next 5 - 10 years.

Grain Requirements

The total production of feedgrains (excluding wheat) in Australia is projected to be in the range of 8,500 kt to 9,000 kt in the period up to 2000. If it is assumed that an additional 1,000 kt of downgraded wheat is available to the pig and poultry industries, the supply of feedgrains exceeds the projected demands of all feedgrain users (6,043 kt) by about 3,500 to 5,000 kt. However, assuming that exports remain in the range of 3,000 to 3,500 kt as projected by ABARE, it is clear that supply and demand are closely balanced. Hence whereas in the past the domestic feedgrain users were able to secure the smaller volumes needed relatively easily, in the future they will increasing be competing with other users and exporters to a greater degree.

At the national level the Australian grain industry is unlikely to face any serious difficulty in meeting the projected grain requirements of the feedlot industry over the next ten years provided that the feedlot industry is prepared to meet world parity prices. Total grain requirements are projected to increase somewhere between 207 kt and 729 kt in the six years to 2000.

It is likely that regional shortages will occur occasionally particularly in the Darling Downs. These will require importation of grain from other regions or, under exceptional circumstances, from overseas. The industry needs to explore possible options for reducing the regional grain shortages.

Given Australia's climatic variability, it is also inevitable that there will be occasional severe droughts that limit the supply of feedgrain for one or perhaps two seasons. If Australia's feedlot industry is to compete successfully with the US, it will be essential that a capacity be established for the industry to import feedgrains in a cost-effective manner when necessary.

8.4 Changes Needed in Industry Operations

In the light of the analyses carried out under this study, we suggest that the key change that is needed in industry operations over the next five to ten years is to improve overall efficiency so that it can compete successfully against the US in the short term and against new entrants in the longer term. In order to achieve this basic improvement, change is likely to be needed in three key areas as indicated below.

- The structure of the feedlot industry and those industries providing inputs to it need to be modified to make best use of Australia's comparative advantages and to help build new strategic alliances. This will require changes at the regional and farm level in the form of specialisation in accordance with the natural advantages of the region and the farm. It will also require changes at the industry and firm level in the form of rationalisation of numbers and feedlot capacity and the development of new strategic alliances with both overseas distributors and domestic suppliers. This is also expected to include rationalisation of the large opportunity feedlotting sector although at this stage so little is known about the sector that it is difficult to identify the extent of changes needed.

- The production systems used to produce feeder cattle need to be modified and specialised to meet the specific requirements of the customers of the feedlot industry rather than trying to serve a range of possible cattle buyers and markets. This requires that the wider beef industry recognises that the feedlot industry has become a major and permanent part of the total industry and that it has specific requirements that need to be met. It also means that feeder cattle producers will require feedback from feedlot operators so that they are able to assess the extent to which they are meeting feedlot requirements. To a large extent, the feedlot industry is still having to obtain its inputs from suppliers who have not targeted any particular market and this is leading to a relatively low level of total industry efficiency.

Although efforts are underway to address some of the major shortcomings of the present production systems these need to be accelerated if Australia is to reinforce its competitive position in the global markets. To a lesser extent, similar changes are needed in the feedgrain industries. These industries need to recognise the growing importance of the feedlot industry and seek to meet its specific needs more efficiently. This may require the development of modified production systems particularly at the regional level.

- The marketing systems used to provide inputs to feedlots and to distribute outputs need to be improved so that they can operate more efficiently and help convey the appropriate price and demand signals needed to drive the changes in structure and production systems that have been outlined above. Most importantly, there needs to be much more effective communication between the feedlot industry and its suppliers of inputs, particularly feeder cattle. This also needs to be linked with the considerable efforts underway to provide an effective grading system that responds to consumers' interests and can be directly used to provide feedback to suppliers. Another important improvement needed relates to the distribution of beef products where the need for the Australian industry is to establish better access to the distribution channels to improve market share and profitability. To a large extent such efforts on distribution channels will need to be done through individual firms with strategic alliances. Much of the industry-based efforts (as opposed to individual firm efforts) is already being studied in other MRC/AMLC studies and hence is largely beyond the scope of this study.

8.5 Recommended Strategies

The overall goal should be to improve the total efficiency of the grainfed beef production system. The ultimate measure of the total efficiency will be the cost of production in Australia in comparison to that in the US and other competing suppliers.

There are three broad strategies that are recommended to achieve the goal;

- Hasten structural change in the cattle supply, grain supply and feedlot industries;
- Facilitate improvements in cattle supply production systems; and
- Accelerate improvements in cattle, grain and grainfed beef marketing systems.

8.5.1 Hastening Structural Change in the Cattle Supply Industry

The objective should be facilitate the sort of structural changes that will lead to improved efficiency. These changes will be based on greater specialisation and changes in the types of enterprises carried

out on farms. In particular, it will involve changes in the northern part of Australia with an emphasis on breeding in the pastoral zone and earlier transfer of young stock for growing out in the endowed (wheat-sheep) zone. It will also include the emergence of specialist backgrounders in the northern and southern regions.

One of the major constraints to specialisation is that it increases risk for the cattle producer by removing scope to serve alternative markets. If producers are to be convinced to specialise to serve the needs of the feedlot industry they will need to be reassured that this will be more profitable to them in the longer term and no less profitable in the shorter term.

One of the effects of specialisation will be to make it possible to meet the demand for beef from a smaller national herd and this will be an important means of reducing the risks that face the total cattle industry.

The larger the national herd the greater the competition with other land uses and this is likely to result in limits to the growth of the industry and possible resource management problems in the form of land degradation and ultimately higher production costs.

The national herd can be minimised while still meeting demand by focusing on the best use of the land resources—ensuring that generally there is a trend towards using land more efficiently. This will also ensure that Australia's costs of production for feeder cattle are kept competitive with those elsewhere.

There is already a trend towards such specialisation evident in the industry, particularly in northern Australia. This trend will need to be accelerated and the specific strategies that could be used to achieve such structural change are detailed in the following section.

Another critically important means of reducing the number of cattle needed is the increase in carcase weights. There is a trend for this to occur but industry should seek to accelerate the trend.

Specific Structural Changes Recommended

- Stratification of production systems in the northern pastoral zone through specialisation so that producers concentrate on doing what each region can do best rather than trying to produce the finished product as at present. This involves earlier turnoff of cattle from the pastoral (harsh) zone and their transfer to better growing areas in the sheep/wheat (endowed) zone.

- Substitution of feedlot finishing systems for grass finishing production systems in the endowed zone with the result that cattle are turned off grass in the endowed zone at

an earlier age and then enter feedlots for finishing rather than being held on the farm for another 12 months to produce grassfed Japanese Ox.

- Utilisation of the estimated 97% of dairy beef bobby calves in southern Australia (particularly in Victoria) that are currently slaughtered at less than one week of age to grow out for feedlot finishing to supply part of the B2 and B3 grade dairy beef in Japan as domestic supplies decline as a result of rising production costs in Japan.

Expected Benefits from the Changes

- Stratification in northern Australia could increase the supply of B1/B2 feeder steers by around 47,000 per year which would be sufficient to meet 65% of the (Baseline projection) increased demand for such cattle by 2000. Although this stratification would probably displace some Japanese Ox and cull cows, the overall returns to the individual operators would be higher owing to the higher value of the feeder cattle when the length of time needed to produce the outputs is taken into account. Alternatively, if the economics were favourable, it would be possible to carry the additional cattle on special forage crops established in the endowed zone.

- The entire increase in the numbers of B1/B2 cattle projected to be required under the Baseline by 2000 (72,000) could be provided by this strategy being adopted by 9% of the herd in the endowed zone of northern Australia. As in the case of stratification, the production foregone would be the grassfed Japanese Ox.

- If it can be shown to be economical to rear these surplus bobby calves and then to finish them in feedlots, this strategy offers considerable scope to expand supplies. It must be acknowledged that there are a range of technical and financial constraints that need to be overcome before this strategy could be implemented.

Recommended Tactics for Implementation

The tactics needed to promote stratification and substitution are similar and both strategies should be pursued together. It requires the following steps:

- MRC in conjunction with the Beef Improvement Association (BIA) and State Departments should define the managerial implications of stratification and assess the financial benefits.

- The State Departments and BIA should prepare extension material and actively promote the strategies and make sure that producers are aware of the benefits to themselves and to the industry overall from the strategies.

- Stock firms and the BIA should encourage producers in the endowed zone to secure store cattle from the pastoral zone.

- ALFA should encourage its members to source cattle from the endowed zone.

- MRC and the Departments of Agriculture should investigate and develop financially attractive production systems for rearing surplus dairy steers.

8.5.2 Strategy to Hasten Structural Change in the Grain Supply Industry

In the course of the study, no evidence was found to support the contention that the feedlot industry was not satisfied with the type or quality of feedgrain available nor that it would be prepared to pay more to obtain feedgrains with particular characteristics. It would appear that the technology of least cost feed formulation was sufficiently flexible to cope with a range of qualities and attributes and that the major concern was availability and price. However, as has been made very clear in the present drought, the competitive ability of the feedlot industry (and in fact the whole beef industry) is constrained on occasions by its access to competitively priced feedgrains. Whilst Australia can generally provide feedgrains at world prices, its supply capacity is subject to seasonal variation to a much greater extent than that of the US feedlot industry with which it is directly competing.

There are two structural changes needed in the grain supply industry to assist in the overall objective of improving the efficiency of the total beef industry.

The first is an improvement in the regional supply and demand balance. In those regions such as the Darling Downs where it appears that grain demand is outstripping supply capacity, there is a benefit to both feedlotters and grain producers if there is greater local production of feedgrains. The constraints to the expansion of feedgrain supplies at the local level are largely financial and feedlots need to examine the extent to which it is worthwhile offering a premium over national "parity" prices to expand production on a local level. In some circumstances there may also be some technical constraints related to the availability of suitable feedgrain varieties in the region. Given the long gestation period of any breeding work and the likelihood of increasing liberalisation of grain movements over time, it is unlikely that there would be any merit in developing breeding programs to serve such a small market as a local regional supply shortfall.

The second change needed is greater flexibility in the use of grain imports in times of national grain shortage such as at present. The current arrangements for the importation and use of feedgrains are unnecessarily costly and will seriously reduce the competitiveness of the feedlot and cattle industries in comparison to the major present and future competitors.

Specific Structural Changes Recommended

- Expansion of feedgrain supplies in the Darling Downs region.
- Liberalisation of constraints on feedgrain imports.

Expected Benefits from the Changes

- In the absence of either greater local production of feedgrain or liberalisation of feedgrain imports it is likely that all further expansion of the feedlot industry in the Darling Downs area will be constrained. Given the proximity of the Darling Downs area to large numbers of cattle it would be worthwhile encouraging local production of feedgrains to make best use of the overall resources available. The magnitude of the benefits needs to be estimated and offset against the costs of achieving greater local production.
- Liberalisation of feedgrain imports has been opposed by AQIS and the grains industry on the grounds that it jeopardises other industries through the introduction of exotic weeds and diseases. The risk of such introductions needs to be carefully assessed and compared with the cost to the Australian intensive livestock industries in times of national grain shortages. The benefits from liberalisation would be the difference between these two costs over time.

Recommended Tactics for Implementation

Responsibility for efforts to encourage greater local production of feedgrains in the Darling Downs will need to be accepted by the local feedlotters in as much as the critical element will be the provision of a premium for locally produced supplies. The alternative may be a greater degree of vertical integration in the industry or greater use of grain storage by feedlotters.

Given the small size of the market and the long lead times for grain breeding work, it is unlikely that any new research effort is warranted to develop varieties better suited to the local environment.

In the case of feedgrain imports, ALFA should join with other intensive livestock producers and continue efforts to lobby for increased liberalisation. It would assist its case if the benefits and risks of the importation could be quantified.

8.5.3 Strategy to Hasten Structure Change in the Feedlot Industry

The objective should be to create an environment that will lead to a feedlot industry structure that will be the most efficient for the beef industry as a whole. This implies an industry that encourages

competition but yet captures the benefits of economies of scale and throughput. It should serve the current customers well but also develop new customers and help reduce the beef industry's dependence on the current major markets. It should be a structure that recognises the primacy of individual firms but it should also have the capacity to draw on industry-wide resources so as to be able to respond to situations where there are market failures.

Because there are in fact two sectors of the feedlot industry, the formal sector and opportunity feedlot sector, there are two major considerations in terms of the structure of the feedlot industry. The structural issues are different in the two sectors and are discussed below.

In the informal or opportunity feedlot sector the main issue is that there is no information available to indicate its efficiency. It is not sufficient to suggest that if it were not efficient and making money then it would not be in existence because in most cases these enterprises are integrated with other enterprises on the farm and hence it is likely that even the operators do not know whether they are making any profits. It has been suggested by some that the informal sector is in fact quite inefficient and that its inefficiency is driving up the cost of feeder cattle and grain above what they would be if there were no such sector. Others have suggested that the existence of the opportunity feedlot sector provides a built-in check against excessive profits by feedlots. Given the very large numbers of cattle involved and the lack of data, it is recommended that this sector be closely studied as a matter of some urgency.

In the formal feedlot sector the structural issues that are most important in terms of industry competitiveness are: the numbers/size of feedlots and their effect on capacity utilisation; the nature and extent of the strategic alliances with distributors and their effect on gaining market share and diversifying markets; and the degree of vertical integration and its effect on competition and competitiveness.

Specific Structural Changes Recommended

- Based on the planned capacity expansion and the GMI projections of future demand, it would appear that the capacity of the Australian feedlot industry may exceed throughput requirements if it is developed as currently proposed. This implies that there will be a need for some rationalisation of expansion plans and possibly for a reduction in feedlot numbers if operators believe that expansion of scale is required for competitiveness of individual firms. This will inevitably lead to some increase in concentration of ownership and control in the feedlot industry. Provided these changes are accompanied by improved efficiency while maintaining an equitable share of returns amongst all sectors of industry, they will be in the long term advantage of the total industry.

- The Australian beef industry as a whole would benefit from the creation and strengthening of strategic alliances between Australian feedlot operators and distributors in overseas markets. These alliances have already being established with operators in Japan and elsewhere but the industry should encourage other parties such as the Koreans and the Chinese by providing the opportunity to obtain some share of the Australian feedlotting capacity as part of the rationalisation process. There are benefits to the whole industry if the ownership base can be widened to include more of the operators in the future market areas.

- At this stage there is little if any objective information that would indicate the extent to which vertical integration of feedlot operators with domestic cattle and grain suppliers facilitates a more efficient operation. It would be in the interests of the total industry to have more information on the relatively efficiency of vertically integrated operations and to assess whether this trend should be influenced in any way by industry action.

Expected Benefits from the Changes

There is no basis at this stage to assess the benefits that could be expected to result from the structural changes outlined above.

Recommended Tactics for Implementation

- Changes associated with a rationalisation of expansion of feedlot capacity will bring about large, but at this stage unquantified benefits, to the industry. These benefits will reflect the economies of scale which are critically important to feedlot efficiency. The changes associated with the creation and strengthening of strategic alliances between Australian feedlot operators and distributors in overseas markets are also likely to be large if the experience with Japanese operators is any indication. As reported earlier, the alliances with Japanese operators appears to be a key factor in enabling Australia to maintain exports to Japan at the currnet levels. On the other hand the impact of vertical integration of the feedlot industry with domestic suppliers (grain and cattle) and processors has not been quantified. Additional work is required to assess the likely magnitude and scope of these benefits.

- The creation of strategic alliances are necessarily the responsibility of individual firms in the industry. The industry associations such as ALFA can only assist by providing information and opportunities for contact amongst potential allies. They can also strengthen their own ties with sister organisations if they exist in other countries. MRC's Marketlink project is already seeking to facilitate formation of strategic alliances.

- The changes in extent of vertical integration are largely beyond the control or even influence of industry organisations. In order to determine whether vertical integration is providing benefits to industry as a whole, comparisons might be made amongst the prices paid for inputs by firms with different levels of vertical integration.

8.5.4 Strategy to Improve Production Systems

Cattle Supply Systems

The objective should be to facilitate the development and adoption of production systems that will lead to improved efficiency. The measure of success in this area will be the extent to which there is a reduction of the costs of production. While this is an obvious change and one that must be pursued continuously by all sectors of the industry, we suggest that there are a number of areas where action is urgently required given that competition for grainfed beef is likely to increase rather than decrease in the future. These will need to address the shortcomings of the present system (particularly the high level of downgrading of feedlot entrants) and provide appropriate technologies to handle operations such as backgrounding (which are relatively new and need to be expanded) and the improvement in overall farm level production efficiency.

Improvements in production systems are needed across all market segments but they are more critical in some segments than others. This is particularly true for the Japanese B3 segment where there is arguably the largest gap between what the market wants and what producers are currently able to provide. As argued elsewhere in this report, the B3 market segment may offer a strategic market niche for Australia in that it will be relatively more difficult for the US to serve this segment than it will for Australia, provided Australia introduces appropriate production systems for the B3 feeder cattle.

One of the major constraints to the adoption of improved supply systems is that the financial benefits of these systems are uncertain and depend on the willingness of feedlot operators to reward those producers that have adopted the practices (or to penalise those that have not).

Genetic Improvements

In order to improve overall efficiency there is a need for ongoing genetic improvement through the identification of desirable traits and selection for those traits in production herds and sires. Whilst this work has already commenced at the Cooperative Research Centre Armidale and is being supported by MRC and others, it needs to be accelerated and widened so that producers have access to preferred genetics and so that inferior genetics can be eliminated from the national herd as quickly as possible. Even though genetic improvement will not provide short term benefits, it is essential that it is expanded and continued to provide Australia with a competitive advantage over other new entrants into the grainfed beef market including South America, China and Korea.

The expected benefits from genetic improvement will be longer term competitive advantage through reduction in wastage associated with downgrading and poor reliability of feedlot performance. In particular, genetic improvement will seek to reduce the very high variability of performance of apparently similar cattle in feedlots in terms of feed conversion, carcase yield and meat quality.

The tactics to implement a strategy of genetic improvement will involve the following steps:

- ALFA and MRC to support a progeny testing program at CRC Armidale for all breeds of cattle to identify animals with preferred attributes and to provide information to breed societies and other interested parties

- Feedlots may choose to offer premiums (or discount non-compliers) to suppliers of feeder cattle meeting specified performance targets

- ALFA, MRC , CCA and BIA to implement an awareness program to promote the use of superior genetics in feeder cattle breeding herds

Herd Performance

There are a range of measures that need to be improved in the general herd performance so that the feedlot industry can operate at a high level of total efficiency. These measures range from improvement of herd fertility and branding percentages in northern Australia to improvement in feed conversion efficiency and weight gains elsewhere. Most of these measures are already being addressed by the CRC Armidale, MRC, Departments of Agriculture and other service providers.

The benefits of such measures will be that they increase the overall efficiency of the national herd. The tactics to use in this area of herd performance would be to identify any remaining problem areas and to provide specific attention to those areas or to encourage other service providers to address the problems.

Backgrounding

In order to be able to accommodate the structural changes recommended earlier in this section it will be necessary to greatly expand the numbers of feeder cattle that are backgrounded. It is recommended that backgrounding be promoted as a specialist operation and that performance standards be developed along with recommendations for practice in specific locations that offer particular benefits to the feedlot industry. Although the larger operators have already commenced backgrounding operations often, through the purchase of additional land in the endowed zone, there is a requirement for a very large increase in backgrounding operations in Australia to support the planned expansion in grainfed beef production. The land resources are available to support this

increase but it will be necessary to encourage rapid adoption of the practice amongst the smaller operators who comprise the majority of the industry.

The benefits of backgrounding are that it reduces the total number of cattle required to meet the total demand for Australia's beef by better matching the requirements of the growing feeder cattle to the fodder available. It also provides the basis for improved feedlot efficiency by pre-selecting those cattle that will not perform well in the feedlot on the basis of their performance during the backgrounding phase. In addition, backgrounding offers a means of improving the availability of feeder cattle by regulating the flow into feedlots and partially offsetting the seasonal peaks in supply of feeder cattle.

Since backgrounding provides benefits to both feeder cattle producers and feedlotters the responsibility for the promotion of backgrounding lies with agencies supporting both parties. The steps that might be taken to hasten the adoption of the concept include the following:

- CRC Armidale, MRC and ALFA to provide information to producer organisations, state departments and to BIA and to encourage the conduct of trials to demonstrate the costs and benefits of the concept to producers in different areas. This may include the development of partial budgets to help producer analyse the relative benefits of this operation in comparison with their present operation.

- Individual feedlot operators may wish to offer forward contracts to backgrounders including premiums based on the subsequent performance of the cattle in the feedlot. ALFA may be able to assist the feedlotters in developing appropriate contracts and provisions.

- MRC and BIA may examine the advantages and disadvantages of alternative ownership arrangements for cattle that are being backgrounded in order to be able to advise whether it is in the interest of the industry as a whole for cattle producers to retain ownership of the cattle further down the marketing chain.

8.5.5 Strategy to Exploit Scope to Improve Grain Supply Systems

The objective should be to firstly determine whether the present production systems for grain supply are adequate to best serve the interests of both parties. If it is found that they are not, it will be necessary to define the improvements needed and to take action that will facilitate the development and adoption of production systems that will lead to improved efficiency.

On the basis of the discussions held during this study, it would appear that the scope for improvement in the grain production systems is limited with the major focus being the opportunity to address regional imbalances and the need to liberalise feedgrain importation. While security of feed supply is clearly a problem in times of national feed shortage, at other times it is not and

feedlotters showed no clear commitment to forward contracts or other means of obtain forward supplies. Similarly, while the nutritive value and particular attributes of the grain used are clearly important, feedlotters were unable or unwilling to define their requirements more precisely than they are now doing. Hence there seems little scope for development of more specifically focused feedgrains given the capacity of feedlots to handle a variety of feed grains with different attributes.

It would seem likely that feedlotters will continue to become more demanding in seeking assurances from grain suppliers that the product is free from contaminants and this is undoubtedly an area that requires further analysis and discussion amongst feedlotters and the grain suppliers.
An increasing number of feedlots are producing at least part of their own feed requirements and it would be in the interests of the grain industry to assess whether this trend was likely to continue.

The GRDC is currently conducting a study aimed at investigating the need for improvement to feedgrain production systems.

8.5.6 Strategy to Exploit Scope to Improve Production Efficiency in Feedlots

The Terms of Reference for this study did not include the feedlot production systems but clearly these need to be assessed if industry is to ensure that it is taking all steps to become a world leader in grainfed beef production. If such studies have not been initiated they should be commenced as soon as possible with strong industry involvement with an aim to benchmark Australian feedlots against world best practice.

8.5.7 Strategy to Strengthen Market Signals and Improve Communications Between Feedlots and Suppliers

The objective should be to ensure that producers of feeder cattle and grains were better informed as to the requirements of the feedlots and that they were adequately and fairly rewarded/penalised to the extent that their inputs met the performance criteria.

In general, the feedlot industry has a substantial task to improve the level of understanding and acceptance of feedlotting amongst its suppliers. At present, the importance of the industry is not generally acknowledged with the result that input suppliers are still not targeting the feedlot industry with their products. Rather, they seem to view feedlots as simply one of several markets with the result that they continue to produce products that are not closely tailored to the specific needs of the feedlot industry. The feedlot industry itself has done little to change this situation and perhaps feels that it is to its advantage to take the role of just one other buyer in the market for cattle and grain inputs. However, owing to the rapid growth of the feedlot industry, it has now moved to a situation where it tends to be a dominant force in the market and to set prices rather than to accept the prices others set. Accordingly, it will have to modify its stance in the market and provide clear market signals if it is to continue to remain competitive.

Improvements in communications are needed in order to: convince input suppliers that this is a market worth following and serving well; clearly specify the inputs needed so that producers can plan for their supply over the medium term; and to strengthen the sense of mutual inter-dependence amongst input suppliers and feedlot operators and processors so that they can collaborate to improve quality and build competitive strengths in advance of increasing competition in the future.

Much of the improvement in communications needs to go to strengthening the market signals and providing better feedback on performance so that producers are able to respond objectively to performance shortfalls. There are already a wide range of initiatives being taken in this area by MRC including the Trading Systems Key Program and by ALFA including its work on grading. These initiatives need to be supported and extended if necessary to meet the specific requirements of the feedlot industry.

8.5.8 Strategy to Improve Market Intelligence

One of the major findings of this study has been that the feedlot industry does not have access to the sort of market intelligence that is available to its competitors.

- The major weakness in the information available is that Australia's own production and trade statistics are presented in a form that is inappropriate for industry planning and analysis. A large part of the effort of this study has been directed to efforts to disaggregate the existing production and market statistics and to re-assemble these statistics in a form that allows analysis. The disaggregation that is needed and should be put in place for the future will enable an analysis to be carried out on the basis of market segments rather than the present aggregation which is of little value to industry.

- A further major weakness in the market statistics now available is that they provide no means of translating shipped product to feedlot entry requirements in terms of cattle numbers and types.

- Another major shortcoming in market intelligence revealed by this study concerns the largely unrecorded informal opportunity feedlot sector that is larger than the Japanese market.

- Finally, the statistics on the national herd and the regional distribution of the herd are not in a form that allows any monitoring of input availability nor any accurate projections of future supply prospects.

The objective must be to develop a market intelligence system that meets industry's needs and disaggregates production and exports according to market segments and links feedlot input requirements with output targets by market segments. It should also be linked with a regional

monitoring of cattle supply prospects. The basis for such a system has been developed under this study. Further work is required to develop this to the operational level.

It is recommended that AMLC and ALFA should support such further development of the market intelligence system.

8.5.9 Strategy to Analyse New Marketing Initiatives

This study has revealed scope for a number of marketing initiatives that warrant further analysis.

Targeting the B3 Market Niche

As indicated in this study, there are some indications that Australia may well have a comparative advantage in supplying an increased proportion of Japan's B3 market as a result of trends in Japan and the US. This warrants further analysis.

Promoting more rapid increases in carcase weights

Considerable improvements in processing and overall industry efficiency would be associated with increased average carcase weights in Australia provided these were achieved using younger and more efficient animals. Some of the supermarkets are already moving towards a carcase weight target of 260 kg and there would be benefits if this target could be extended throughout Australia. As well as improving efficiency this would send a clear message to producers of the need to change production systems to align with market requirements.

Encouraging the reduction in numbers of product lines

Scope exists to reduce the number of different product lines by encouraging greater overlap in the specifications of products to different markets. Such a move would reduce risks associated with volatility of demand in particular markets and make it easier to shift product onto other markets if appropriate. It would also provide greater efficiency and clearer market signals.

Encouraging Adoption of Boxed Beef

In order to assist in arresting the decline in domestic consumption of beef and to help prepare Australia's capacity to expand value added exports, consideration should be given to encouraging the adoption of boxed beef. The use of boxed beef enables the meat to be aged and thus improve its tenderness and consumer acceptance. This could be a valuable component of any industry initiative to develop a "tenderplan". The major constraint to such ageing is that it requires additional investment in chiller space. In addition, the present industry regulations requiring employment of qualified butchers in supermarkets discourages any moves towards boxed beef even though it would

be more efficient. It is recommended that industry seeks to encourage the adoption of boxed beef wherever the opportunity arises.

Encouraging greater use of heifers

At present there remains considerable resistance to the feeding of heifers although this is becoming more common, particularly in Queensland. Since use of heifers results in considerable reduction in the size of the national herd required, consideration should be given to encouraging the greater use of heifers.

8.6 Strategy, Priorities, Tactics and Responsibilities

Strategy	Sub-strategies, objectives & priority	Tactics	Responsibility
Accelerate structural change in cattle supply through stratification and substitution in northern Australia.	Stratification of industry in northern Australia to turn cattle off pastoral areas at earlier age and transfer to endowed zone. Use to increase supply of mainly B1/B2 feeder steers and to increase returns for all sectors. (First priority).	Demonstrate the managerial implications and the financial benefits of stratification to the pastoral zone producers.	State Departments, BIA, Cattlemen's Union (CU) and United Graziers Association (UGA) and MRC working in conjunction with commercial operators who have adopted the changes.
		Provide credible extension material to encourage change.	State Depts and BIA
		Encourage producers in endowed zone to secure store cattle from pastoral zone.	Stock Firms and BIA
		Encourage feedlots to source cattle from endowed zone.	ALFA
	Substitution of feedlot finishing for grass-finishing in the endowed zone of northern Australia. Use to provide younger cattle for B1/B2 markets and to increase returns to all sectors. (First priority).	Demonstrate the managerial implications and the financial benefits of substitution to the endowed zone producers.	State Depts, BIA & MRC
		Provide credible extension material to encourage change.	State Depts & BIA.
		Encourage feedlots to source cattle from endowed zone.	ALFA
	Expansion of the dairy beef industry by facilitating the use of a higher proportion of surplus dairy steer calves to supply the B2 and B3 dairy beef market in Japan. (Second Priority).	Develop finanical atractive production systems for rearing surplus dairy cattle.	MRC and Departments of Agriculture in conjunction with DRDC.
		On-farm actions implementation.	Individual property owners and operators.

Strategy	Sub-strategies, objectives & priority	Tactics	Responsibility
Accelerate structural change in grain industry.	Improve regional supply and demand balance by encouraging increased feedgrain production in Darling Downs. (First priority for affected feedlots)	Provide incentives for increased local production in form of premium or forward contracts for specified grain.	Individual feedlots
		Investigate scope for increased storage of feedgrains and vertical integration.	Individual feedlots
	Negotiate cost-effective basis for importation of feedgrains under severe national drought situations. (First priority)	Objectively assess risks and benefits from more cost-effective producers for grain importation.	ALFA & MRC.
		Collaborate with other feedgrain users and grain handling agencies to prepare least-cost, low risk grain importation strategies.	ALFA
		Seek support from other sectors of beef industry and other industries likely to be affected by continued import restrictions.	ALFA
		Lobby government and grains industry for change.	ALFA
		Implement importation program.	AQIS in conjunction with ALA and other grain importers authorities.

Strategy	Sub-strategies, objectives & Priority	Tactics	Responsibility
Encourage increased efficiency in feedlot industry.	Rationalise plans for capacity expansion to match demand projections. (First priority)	Publicise revised demand estimates prepared in current study.	ALFA
	Encourage strategic alliances between Australian feedlot operators and distributors in overseas markets. (Second Priority)	Identify and promote the benefits of strategic alliances to the general public (i.e. it is not "selling the farm") and in feedlot sector and cattle industry in general.	ALFA, MRC, and CCA.
	Investigate scope for improved efficiency through vertical integration. (Third priority)	Assess whether the feedlot operators that have higher levels of vertical integration are operating more efficiently than others.	ALFA & MRC
		Implement measure to improve feedlot efficiency.	Individual feedlots.
	Move opportunity feedlots into formal sector.	Study opportunity sector efficiency.	MRC
		Encourage rationalisation of opportunity sector.	ALFA

Strategy	Sub-strategies, objectives & Priority	Tactics	Responsibility
Facilitate development and adoption of improved cattle production systems.	Accelerate program of genetic improvement aimed at improved efficiency through feed conversion, carcase yield and meat quality and reduced downgrading. (First priority)	Progeny testing or similar scheme to identify sire lines with desired attributes. Promotion of superior genetics. Implement genetic improvement through changes in sires and selection.	CRC Armidale, Breed Societies, BIA. Breed societies, feedlots anbd individual producers Individual property managers.
	Accelerate program to improve herd performance. (Second priority)	On-going programs to improve all aspects of herd performance. Implement herd improvement through changes in management practices.	CRC Armidale, Dept of Agricultural, CSIRO & MRC. Individual property managers.
	Expansion of backgrounding as a specialist operation which improves the match between requirements of growing cattle and fodder available and improves the flow of cattle into feedlots. (First priority)	Preparation of objective information in preferred techniques, costs and benefits of backgrounding in different regions. Provision of incentives to producers in forms of better feedback on performance, forward contracts and premium for cattle that perform well in feedlots. Investigations of benefits from alternative ownerhsip arrangements and custom feeding. Implement backgrounding through changes in management practices.	MRC, CRC Armidale, ALFA & Depts. Individual feedlot operators. MRC, BIA and individual feedlots. Individual property managers.

Strategy	Sub-strategies, objectives & Priority	Tactics	Responsibility
Exploit scope for improved grain supply systems.	Determine whether scope exists to improve grain supply arrangements to the mutual benefit of grain users and producers. (Third priority)	Explore willingess (and capacity to pay) of feedlot operators to provide incentives to secure supplies of feedgrains with particular attributes. Explore willingness (and benefits) of feedgrain producers to offer secure supplies of feedgrains with particular attributes. Implement changes to exploit scope.	GRDC and Grains Council of Australia. Individual feedlot operators and grain growers.
Exploit scope for improved production efficiency in feedlots.	Take steps to ensure that the Australian industry is world class in its efficiency. (First priority)	Compare Australian efficiency with US. Identify scope for improvements. Implement changes to improve efficiency.	MRC & ALFA. CRC & MRC & ALFA . Individual feedlots.
Strengthen market signals and improve communication between feedlots and suppliers.	Take steps to ensure that producers of feeder cattle and feedgrains were well informed on input requirements and input performance. (First priority)	Improve the general level of understanding of the importance of the role of feedlots in the total cattle industry. Encourage producers to target the feedlot industry by providng feedback and incentives for performance of cattle and feed inputs. Encourage feedlot operators to take wider view of their impact on total industry and degree of mutual interdependence with input suppliers. Implement improvements in communications and market signals.	ALFA, CCA, BIA and Depts. Individual feedlots. ALFA & MRC (Marketlink). Individual feedlot operators.

Strategy	Sub-strategies, objectives & Priority	Tactics	Responsibility
Improve market intelligence.	Take steps to collect and present statisitics in a form that can be used by industry for ongoing planning and industry development. (First priority)	Put in place a system for presentation of industry statistics based on market segments as developed by the current study. Monitor regional supplies of cattle and feedgrains.	ALFA, AMLC & MRC. ALFA.
	Provide an objective basis to assess the contribution of the opportunity feedlot sector to the beef industry in Australia. (First priority)	Conduct a broad ranging survey to assess the efficiency of the informal oportunity feedlot sector. Implement improved market intelligence system.	MRC & ALFA. ALFA & AMLC.
Analyse new marketing initiatives.	Assess the scope of new initiatives in marketing to improve the competitiveness of the Australian feedlot industry. (Second priority)	Assess the scope for Australia to target the B3 market in Japan. Encourage adoption of heavier carcase weights from more efficient and younger animals to improve overall industry efficiency. Encourage a reduction in the number of product lines/specifications to improve efficiency and to reduce risk. Encourage adoption of boxed beef in the domestic market. Encourage greater use of heifer beef as a means of reducing the size of the national herd and improving total industry efficiency. Implemnt initiatives.	AMLC, MRC & ALFA & individual exporters. ALFA & CRC and individual exporters. AMLC, ALFA & individual feedlots & exporters. Individual feedlots and AMLC. CCA, BIA and individual producers and feedlots & exporters. Feedlots processors, exporters & retailers.