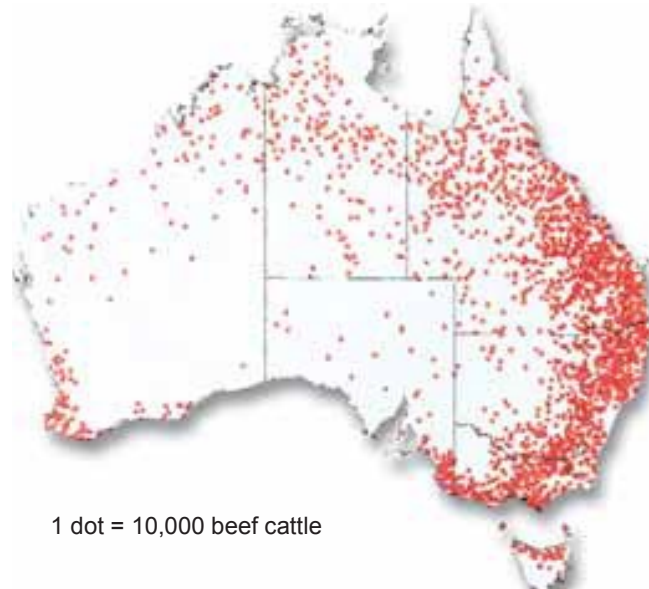


Beef Cattle — Background Information

Beef cattle first came to Australia with European settlement over 200 years ago. In the last thirty years the industry has asserted its position as a major contributor to the Australian economy. Initial growth was limited by the need to supply only the domestic market and the industry spent many years in the shadow of Australia's successful wool industry.

The advent of shipboard refrigeration at the turn of the 20th century provided the first glimpse of the industry's true potential. When the UK joined the EEC (now EU) in the 1960s, and withdrew as a major customer of Australian beef, the industry was forced to search for alternative markets. Subsequent growth in the US grinding beef market and the emergence of the north Asian markets such as Japan and Korea saw the true potential of the industry realised. Australia now exports beef to over 100 countries across the globe making it the world's largest beef exporter.



A recurring theme within the beef industry has been the ability of cattle producers to breed stock that are capable of adapting perfectly to the local climate, whether in the tropical north, the temperate south or any of the many variations between. By having stock that are well adapted, production and performance can be maximised, traits that are vital in the successful production of top quality beef. These traits have similarly seen Australia become the world's most successful exporter of live cattle.

There are currently around 27 million cattle across Australia supplying domestic and international beef and dairy markets.

Industry development

Beef cattle came to Australia with the first European settlers in 1788 and were used



for supplying beef and milk to the new colony. The industry spread with new settlement through most of the next 100 years, though still supplying the beef needs of only the local communities. The real backbone of Australian agriculture through the 19th century was wool, and for many years beef was seen as a poor cousin. The breakthrough that started the genuine development of the beef industry was the first shipment of frozen beef from Australia to the UK. This was Australia's first exposure to international markets and led to the significant expansion of cattle into northern Australia.

Early development of the Australian beef cattle industry was based on the Shorthorn breed, due to its adaptability to Australian conditions. The hot, dry and rugged pastoral regions of north-western Queensland, the Northern Territory and the Kimberley region of Western Australia could be economically grazed by the Shorthorn, and it quickly became the major breed.

The Hereford breed also expanded rapidly, quickly becoming the dominant breed

throughout southern Australia. The expansion of this breed was due in a large part to the opening of the UK market. With the continued development of the beef industry through the 1900s, the Hereford breed gradually established its dominance in the Australian herd.

The Angus breed developed mainly in south-eastern regions of the continent, where it thrived on the lush pasture produced by high rainfall. The breed has expanded rapidly in the past two decades due to the growth of lot feeding in Australia. With its good meat marbling and tenderness qualities coupled with its ability to be managed in a lot feeding environment, the Angus successfully meets the needs of the specialised Japanese export market. The Red Angus has also increased in popularity in recent years, particularly in northern Australia where its red colour gives a comparative heat tolerance advantage.

Other British breeds introduced to the south-eastern high rainfall areas of Australia by the early European settlers were the Devon, South Devon, Galloway,



Red Poll, Lincoln Red and British White, although these have not expanded as successfully as the Angus.

The opening of the US market for Australian grinding beef in 1960 spurred industry expansion, particularly in northern Australia. At around the same time, industry innovators were starting to notice the adaptability of *Bos indicus* cattle to northern Australia. Of particular relevance was their genetic resistance to ticks and their heat and humid climate tolerance. While resistance to the introduction of Brahman cattle was initially strong, their value traits could not be ignored and *Bos indicus* cattle now dominate the pastoral regions of northern Australia.

Early importation of *Bos indicus* cattle, then known as Zebu types, came from India. But the development of tropical

cattle production only really began with the introduction of the American Brahman breed in 1933, predominantly to the tropical coastal areas of Queensland. In order to maximise productivity while also achieving heat and tick tolerance, *Bos taurus* cattle were crossed with *Bos indicus* cattle. Composite breeds include the Droughtmaster, Braford, Brangus, Belmont Red, Charbray and Simbrah.

The genetic base of breeds suitable for beef production in the hot, harsh, tropical areas of Australia was also widened by the importation of other tropical beef breeds. Santa Gertrudis from America, the Africander, Tuli and Boran from southern Africa, and the Sahiwal and Red Sindhi from the Indian sub-continent all contributed favourable characteristics to the genetic pool.

In the late 1970s, the federal government, in conjunction with the beef industry, launched the Brucellosis and Tuberculosis Eradication Scheme (BTEC). Although ultimately successful, and of immense benefit to the Australian beef industry, it caused major disruption to cattle producers in northern Australia. The BTEC program has, however, greatly improved the management of northern Australian cattle with accompanying gains in beef quality. As a result the northern Australian cattle industry was well positioned to take advantage of the live cattle trade to South East Asia, which subsequently emerged in the 1990s.

Cattle production in Australia can now be roughly divided geographically between the *Bos indicus* and *Bos taurus* areas. An imaginary line running west from the city of Brisbane divides cattle production into north and south. North of the line, production is based on *Bos indicus* genetics while production south of this line is based on *Bos taurus* genetics, although overlapping does occur.

Southern beef production has seen the development of composite breeds based on British and/or European stock. The best known of these is the Murray Grey, which was developed from grading up Shorthorn and Angus foundation stock to the point that now it has become a major southern breed. The Murray Grey has developed an excellent reputation for its carcass quality, which is suited to the Japanese grain fed market. Other composite breeds include the Mandalong Special and Chiangus, while small framed breeds such as the Angus derived Lowline, the Murray Grey derived Square Meater and the Mini Hereford enjoy some niche popularity.

The major European breeds were not introduced into Australia until the early 1970s. These breeds were initially introduced via semen imports, followed by imports of part-bred and purebred animals as well as fertilised ova. The breeds included the Charolais, Simmental, Limousin and Chianina. Other breeds to follow were the Maine-Anjou, Romagnola,

Blonde D'Aquitaine, Brown Swiss and Marchigiana. Their popularity was based primarily on cattlemen seeking to increase the frame size of their cattle and to decrease fat cover. Salers, Gelbvieh, Piedmontese, Braunvieh, Belgian Blue, Bazadaise and the Japanese Wagyu have also been imported. Some of these breeds are attracting significant interest from producers and buyers while others have failed to expand.

Crossbreeding

Crossbreeding is a relatively recent phenomenon in Australia, developing in southern areas with the introduction of European breeds and in the north with the introduction of *Bos indicus* cattle. The easy production gains available through





hybrid vigour are difficult for commercial cattlemen to ignore and the practice has become more widespread. There has emerged in Australia something of a balance between cattlemen who successfully maintain purebred herds, and those who have adopted crossbreeding techniques.

Crossbreeding has been a valuable tool for cattlemen wishing to produce cattle that exhibit the specific traits required in a particular situation and also provides greater flexibility by expanding the available gene pool. An example of its successful use in Australia is where a

northern producer maintains a breeding base of pure Brahman cows for their climatic adaptability traits, but introduces a British breed bull as a terminal cross for the greater market acceptance of the progeny for feedlot fattening.

Other, more complex, crossbreeding systems have been adopted by some producers who use multiple breeds with the aim of stabilising a second or third cross composite herd. The aim here is to stabilise the genetic base while still achieving significant heterosis. In other words, they aim to maintain the ease of

purebred breeding, but with the benefit of hybrid vigour. These systems can be very successful but are quite complex to develop and implement.

Crossbreeding has never been as popular in Australia as in the US and Britain. Most of the Australian crossbreeding has been geared towards the development of new, composite breeds. However, there has been a recent and interesting move into

A simpler system uses a base British or European breed cow and mates it to one of the favoured carcase breeds such as the Angus, Murray Grey or Wagyu. Their progeny are sold as prime young pasture fed steers for the domestic market, or for on-sale as fatteners for feedlots. The F1 heifers from these matings are often sold as potential breeders.

These crossbreeding programs have



two, three and even four breed crossing, particularly in the southern states. Typically, these crossbreeding enterprises use British breed cows as the base, mated to bulls of European breeds for high fertility and calving rates and good milking traits. The female progeny are then crossed with breeds of high growth rate and preferred carcase quality traits.

resulted in the evolution of new crossbred composites designed to include the best traits of a number of breeds, combined with the vibrancy of hybrid vigour. Early versions were the Beefmaker and Simford, but the more complex composites such as the Shaver Beefblend and the Excellerator are more popular today.

Crossbreeding has also been a major

element in the mid 1990s boom in northern live cattle exports. The trade has brought new life to the beef cattle industry of northern Australia, providing real competition and better prices to isolated areas previously threatened by abattoir closures. Historically, beef producers in the north turned off fully grown bullocks at least four years old. With the live cattle trade, younger, lighter cattle are required with a consequent greater emphasis on the productivity and fertility of cows, and the growth characteristics of their progeny. With increased income from live exports, cattlemen have been better positioned to improve their livestock and property. As a result, local economies have benefited from large amounts of money spent on infrastructure and lifestyle improvements.

Significant for industry has been the investment in good Brahman bulls to upgrade the old British breed-based cattle herds.

These Brahman, Brahman crosses and other tropical breeds of cattle are the backbone of the live cattle export industry. Markets like Indonesia, the Philippines, Malaysia and Brunei are hot and humid and require cattle that will thrive, grow and fatten in these conditions. The *Bos indicus* cattle fill this role admirably and as a result, ensure the long-term viability of the northern cattle industry.

Exports to Middle Eastern markets tend to be heavy animals ready for slaughter, so their time in the importer's feedlot is

limited. Although cattle with some *Bos indicus* blood perform better in Middle Eastern conditions, customer demand still favours the *Bos taurus* type. These heavy, finished cattle are typically bred and exported from the southern regions of Australia.

Exports to Japanese feedlots require yearling steers that have the ability to respond to the heavy Japanese grain rations and produce carcasses that are well marbled. This trade is almost exclusively sourced from *Bos taurus* breeds, particularly the Murray Grey, Angus and increasingly Australian bred Wagyu crosses.

BREEDPLAN

Australian cattlemen have a history of embracing new technologies and responding to the demands of the market. Modern breeding techniques are a vital part of the beef industry, allowing seedstock producers to maximise the expression of the high quality genetics at their disposal.



Performance recording of beef cattle in Australia has been coordinated by the National Beef Recording Scheme (NBRS) since its formation in 1972. The NBRS developed and introduced BREEDPLAN in 1985.

BREEDPLAN is a modern genetic evaluation system for beef cattle breeders, based at the University of New England at Armidale in New South Wales.

BREEDPLAN offers bull breeders the potential to accelerate genetic progress in their herds. It also provides objective information on cattle sold to commercial breeders.

Breeding Values (EBVs) for a range of traits. The EBV is based on the animal's own performance, the performance of known relatives, and the heritability of each trait and the relationship between the different traits. In other words, BREEDPLAN combines all traits in one analysis.

All breeds of beef cattle in Australia use BREEDPLAN and, for most breeds, the BREEDPLAN genetic evaluation system has been integrated with the respective association's pedigree system. This has demonstrated substantial genetic improvement for commercially important traits.

The Animal Genetics and Breeding Unit (AGBU) at the University of New England (UNE) undertake research into the genetic evaluation system on behalf of

BREEDPLAN. In addition, the Beef Quality Cooperative Research Centre, also at UNE, undertakes detailed research and field trials to determine the relationship between genetics and beef quality. This information is used by AGBU to update the BREEDPLAN system.

BREEDPLAN technology is highly regarded overseas and in some countries it is available under licence. It has been adopted as the national beef recording scheme in Australia, New Zealand, the US, Argentina, the UK and Mexico.

Genetic databases for particular breeds in these countries are now being merged to conduct international genetics evaluations. This is because the larger the population of cattle being evaluated, the higher the chance of finding elite genetic material. This can then be rapidly disseminated using artificial breeding techniques to improve competitiveness and beef production in all cooperating countries.

The lot feeding sector

The growth of export markets requiring a consistent supply of cattle, uninterrupted by climatic conditions, led to the rapid expansion of the Australian lot feeding industry in the mid 1980s. Successful in supplying growing Asian markets, feedlots have had a major impact on the Australian beef industry and today provide the benchmark for cattle prices in eastern Australia.

The feedlot industry also delivers non quantifiable benefits to the national beef industry and has been the catalyst for a number of significant advances including marketing cattle at younger ages, improving herd productivity, expanding beef industry markets, stabilising domestic market demand, improving co-product values and aiding live cattle exports.

Feedlots are concentrated in Australia's mixed farming country with the majority located in south-east Queensland and the Northern Tablelands and Riverina regions of New South Wales. There are currently more than 620 accredited feedlots in Australia representing a total capacity of 1.1 million head (2005).

The feedlot industry turnover exceeds two million head per annum, with a record 2.6 million head in 2005. This equates to approximately one quarter of the cattle processed in Australia. These cattle are marketed predominantly to Japan (over 50%), and the domestic market.

The Australian feedlot industry has a significant national impact. It purchases \$1.82 billion of cattle; \$653 million of feedstuffs; directly employs approximately 1,600 personnel; and turns off cattle valued at approximately \$3 billion at the feedlot gate.

A raft of state and local government regulations control the feedlot industry; however its major and most effective control is the industry-based National

Feedlot Accreditation Scheme (NFAS).

The NFAS continues to be a successful system as it promotes production efficiency and excellence while acknowledging and addressing animal welfare and environmental concerns.

The lot feeding sector is an integral part of the beef industry. It provides well finished cattle 365 days a year, ensuring a consistent supply of beef to customers.

They can also produce different categories of beef to meet varying customer requirements. In addition, lot fed beef is well placed to provide customers with a consistent eating quality product as a result of the nutritionally balanced ration over the feeding period.

