

**Country Report of Australia  
for the FAO First Report on the  
State of the World's Animal Genetic Resources**



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## Executive Summary

Australia has a significant meat and livestock industry. This Australian report to the FAO on animal genetic resources in Australia provides information to assist in ongoing analysis on the state of the world's animal genetic resources.

The report describes Australia's livestock industries and the key role that the country's diverse livestock breeds and commercial strains play in maintaining the economic and genetic sustainability of its farm animal production systems. It also outlines influences on national livestock production and future breeding programs.

Australia has a long history in adapting imported breeds to a wide variety of production environments. The genera and breeds of livestock demanded by domestic and overseas markets and suitable for agricultural production have generally all been imported into Australia from elsewhere. Following importation they have been developed and adapted by selection and some crossing to suit the prevailing environmental conditions and market requirements.

The animal-breeding sector responded very effectively to demands for increased productivity in the second half of the 20th century by applying selection pressure to certain high-yielding breeds, to improve environmental adaptation and production efficiency. This has occurred in all major areas of animal production including sheep, cattle, pigs and poultry. Characters selected for include adaptation to Mediterranean, temperate and tropical environments. Consequently many lines are major assets to Australia.

In Australia, mainstream breeding of agricultural animals has focussed on achieving sustainable industries through adapted and productive livestock. Genetic inputs from many continents have been used to achieve this and conservation of adaptive genotypes has been achieved by making the animals desirable for production purposes and ensuring their presence in sufficient numbers to provide responses to selection over the long term.

Management and conservation of rare and endangered breeds is currently of a lower priority than management of mainstream production animals and is generally carried out by private breeders with the support of non-government organizations (NGOs). The genetic evaluation programs of mainstream commercial livestock, coordinated by industry bodies and various Rural Research and Development Corporations (RDCs), have generally not involved conservation of rare and endangered breeds but have aimed to exploit existing genetic variability through extensive involvement of large numbers of animals in the breeding sector.

The information infrastructure for recording performance and pedigree data in Australia is world class, employing leading-edge technology, and will improve further with implementation of the National Livestock Identification Scheme (NLIS) which commenced 1<sup>st</sup> July 2004. The human resources and genetic evaluation tools are world class. Cooperation between various sectors in Australian livestock production (including individual farmers, breed societies, industry associations, RDCs, universities, CSIRO and Government institutions) enables efficient use and exchange of data collected from many sources.

Avoidance of disease, and management of animal pests and diseases, is integral to maintaining diversity in genetic resources and in facilitating the trade in genetic resources which is necessary to help underpin efficient conservation and production activities. Occurrence of disease can endanger survival of animal populations and their genetic resources.

## Preparation of the report

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Expert assistance in the preparation of this report was graciously provided through ongoing discussions and review of drafts by: Professor Stuart Barker FTSE; Professor Frank Nicholas; Dr Keith Hammond; and Dr John Vercoe AM FTSE.

# **CHAPTER 1 ASSESSING THE STATE OF AGRICULTURAL BIODIVERSITY THE FARM ANIMAL SECTOR IN AUSTRALIA**

## **1.1 Overview of Australian agriculture, animal production systems and related animal biological diversity.**

### **Australian Agriculture - general context**

In land area Australia is the world's sixth largest nation. Australia covers a land area of 768 million hectares, lies in the Southern Hemisphere and has seven external territories including the Australian Antarctic Territory.

Australia has a Federal system of Government, with powers split between the national Government and the Governments of the six States and two Territories. Both levels of Government are involved in policies and measures affecting the agricultural sector. With a low level of direct support to farmers in Australia, research and development (R & D) has proven to be essential in maintaining the international competitiveness of its agriculture and food industries. Expenditure on R & D is seen as a partnership between government and industry, with significant agricultural R&D funded by industry, with matching Federal Government funding up to a fixed proportion of the gross value of production of the industry concerned. Research is also conducted by state government agencies.

The population of Australia is about 20 million people, with a density of about 2.6 people per square kilometre. Australia's climate ranges from tropical monsoon in the north, to Mediterranean in the south, to temperate in Tasmania, with a vast, arid region in the interior. The continent has a generally flat land surface, with relatively low precipitation and runoff rates. Mountain ranges in the southeast are often snow covered in winter, but Australia generally experiences mild winters and hot summers. Drought is a recurring climatic feature over most of the continent.

The Australian economy has undergone considerable diversification and expansion over the last 30 years, much of the expansion being related to the tertiary sector. There has been significant investment in export oriented mining and energy industries, and in a large and diversified modern agriculture sector. Australia exports around 80 percent by value of its agricultural production. Thus, maintaining and increasing export market access is most important to the continued prosperity of Australian agriculture. Multilateral processes, in particular the WTO Doha Round and, increasingly, free trade agreements, are being emphasised to improve the trading environment, open new markets, create new opportunities and reduce barriers in existing markets for Australian exporters. Tariff protection on imports of agriculture and food products is very low overall in Australia but tariffs do exist for a few agricultural products. Agricultural imports are subject to non-tariff provisions in the form of sanitary and phytosanitary (SPS) measures. This system is consistent with international protocols, particularly the WTO SPS Agreement, and is intended to allow safe and least-restricted trade, while protecting Australia's agriculture, natural environment and the health of its people from exotic pests and diseases.

The Council of Australian Governments (COAG) provides a forum for the different spheres of government to discuss and develop nationally consistent approaches to issues. Ministerial Councils play a key role in implementing nationally consistent policies and programs. These include national approaches in matters concerning animals, eg animal welfare.

## **Australia's agricultural sector: production systems, diversity and outputs**

The pattern of Australian agriculture is determined to a large extent by Australia's climate, which is characterized by scarcity of rainfall and high evaporation rates in many areas. A second determinant of Australian agriculture is the quality of its soils. Australian soils in general are derived from ancient, deeply weathered materials, and have low chemical and physical fertility. Significant parts of the continent have salt occurring in association with groundwater, and trapped in rocks of marine origins. Many soils in Australia have lower fertility than those of Europe and North America.

Agriculture dominates Australian land use, with approximately 63 per cent of Australia under some form of agricultural use. The vast majority (91%) of agricultural land is minimally modified native pasture and a further 8% is improved pastures and cropland. About 2 million hectares is irrigated (National Land and Water Resources Audit 2001). Australia has 4.6 million square kilometres of agricultural land, of which about 0.5 million square kilometres is arable. Some 70 percent of Australia's land area falls into zones referred to as rangelands where pastoralism is the dominant agricultural land use. About 10 percent of Australia's sheep flock of about 100 million head, and around half the country's 27 million beef cattle herd are carried in these regions. Stocking rates are relatively low by world standards, but the total grazing pressure includes grazing by macropods, whose numbers have increased in response to agricultural improvements such as extra watering points, and by exotic feral mammals, including rabbits and goats. Australian rangelands are made up of a diverse array of environments and ecosystems shaped by strong climatic and geological forces. The climate is unpredictable and the scale of management is immense compared to European agricultural systems. The rangelands are also significant to Aboriginal communities and contain nationally and internationally significant conservation areas.

About 3.6 per cent of Australia's population are either employed in agriculture or dependent on someone who is. There are about 120,000 commercial farms in Australia, plus about 50,000 low-income and hobby farms where the majority of income is earned off-farm. The majority of farms are owned and managed by families. Only about 6 percent of commercial farms have corporate or similar business structures. Since the early 1980s, considerable restructuring of Australian agriculture has taken place. Until this time, the agriculture industry was production-oriented and dominated by the wheat, sheep and beef industries supplying bulk products through regulated marketing arrangements. The declining terms of trade for the traditional commodities, together with the increased exposure of Australian agriculture to world markets, has resulted in enterprise diversification and the adoption of new agricultural practices and technologies.

Australia currently exports approximately 80 percent of its agricultural produce. Major agricultural exports include grains, wool, beef, sugar, dairy products and cotton. The gross value of Australian farm production in 2001-02 approached \$A40 billion and the value of Australia's farm exports was estimated at \$A31.2 billion. Exports of horticultural products are relatively low, but the total value of production is now approaching the value of production of grain crops. Australia's major agricultural export markets in 2002-03 were South East Asia (14 per cent), Japan (15 per cent), the United States (11 per cent), the European Union (10 per cent), China (8 per cent) and Korea (5 per cent). Australia's farm exports in 2002-03 represented 3 per cent of world agricultural exports.

There has also been increasing recognition of the need for the agricultural resource base to be environmentally, as well as economically, sustainable. The productive capacity of some soils has been declining due to breakdown in soil structure, acidification, salinisation and erosion. To encourage farmers, other land users and resource managers to take more responsibility and be skilled in the sustainable management of the resources they own or control, the Commonwealth Government has not only established the National Landcare Program whereby grants are provided

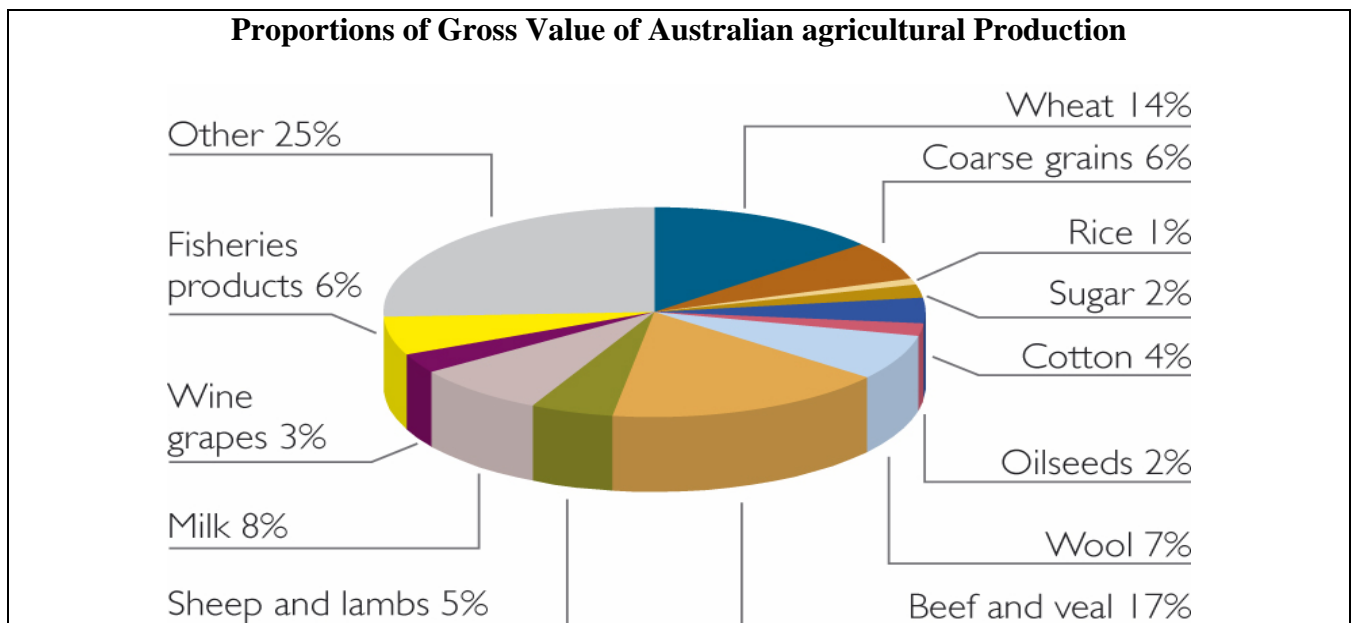


to develop and demonstrate local solutions to local problems, but is also promoting Environmental Management Systems and testing a number of market based instruments. To date, about 30 percent of all Australian farmers are members of Landcare groups of which over 2,500 have been established around Australia. Land use and resource use decisions are also being influenced through more appropriate natural resource valuations. For example, water resources management and environmental flow considerations are being pursued through COAG water pricing reforms.

### **Australian livestock production**

The net value of overall farm production in 2001-02 was \$11.2 billion (see table below). The recent drought has been widespread and resulted in the net value of farm production in 2002-03 falling by 77 per cent to around \$2.6 billion. The gross value of farm production in 2003-03 decreased by 22 per cent to just under \$31.0 billion due largely to reduced crop production and lower prices for some livestock products.

Although beef, wool, dairy and sheep meat production have been the dominant animal industries for many years the sector is quite dynamic. The nature of products arising from these industries has changed markedly over the last fifty years and new industries have emerged. A dramatic instance of this has been the chicken meat industry which has increased production over the past thirty years, currently producing about 670,000 tonnes of chicken meat annually with a retail value in excess of \$2.7 billion. Chicken meat now rivals beef as Australian consumers' most popular meat. Annual growth in production of approximately 4% has been experienced by the industry over the past few years and similar levels of growth in production volume are expected in the future.



Source: Australian Agriculture, Fisheries and Forestry At A Glance, Australian Government Department of Agriculture, Fisheries and Forestry, 2003.

Overview of Australian Agriculture					
		1999-2000	2000-2001	2001-2002	2002-2003
<b>Gross value of farm production</b>					
Crops	A\$m	17 067	18 681	21 174	14 144
Livestock	A\$m	13 310	15 928	18 572	16 854
Total	A\$m	30 377	34 609	39 746	30 998
<b>Net value of farm production</b>	A\$m	4 956	7 702	11 240	2 620
<b>Value of farm exports (fob)</b>					
Crops	A\$m	12 649	14 743	15 962	13 158
Livestock	A\$m	11 510	14 725	15 207	13 878
Total	A\$m	24 159	29 468	31 169	27 036
<b>Crop area and livestock numbers</b>					
Grains and oilseeds area	'000 ha	20 592	21 097	20 654	19 734
Sheep	million	119	111	106	98
Cattle	million	28	28	28	27
<b>Employment</b>					
Agriculture	'000	383	369	284	238
Forestry and logging	'000	9	13	11	9
Commercial fishing	'000	16	19	15	13
Total portfolio, incl. services	'000	438	429	438	402
Total Australia	'000	8 907	9 086	9 207	9 340
Source: Australian Agriculture, Fisheries and Forestry At A Glance, Australian Government Department of Agriculture, Fisheries and Forestry, 2003.					

## 1.2 Assessing the state of conservation of farm animal biological diversity.

### Major agricultural species in Australia

The common species of farm livestock in Australia are, sheep, cattle, pigs, poultry, goats, and horses and ponies. There are also small populations of deer, camelids, rabbits, banteng cattle and water buffalo. There are small populations of farmed ratites (emus and ostriches).

This report does not focus on native animals. Most work in relation to breeding and genetic variation in native animals is undertaken in environmental and conservation contexts. Apart from kangaroos and emus most native Australian animals are not considered to have any substantial or significant role as agricultural animals. Some kangaroos are harvested under strictly controlled licensing arrangements at sustainable levels. There are some minor industries associated with crocodiles, possums and native water rats, all largely based on the value of the skins. There are no wild ancestors of domestic stock in Australia and all the significant agricultural species in Australia have been imported from overseas.

Maps showing the distribution and abundance of the major agricultural species in Australia are shown in Appendix 1, summary statistics of the major industries are shown in Appendix 2, and figures on breed composition are shown in Appendix 3.

### **Conservation status of important agricultural species in Australia**

Australia's contribution to maintaining viable populations of farm animals has occurred largely through its efforts to ensure livestock are efficient and profitable in their respective production systems. Australian effort concentrates on developing husbandry systems and genetic selection methods that ensure genotypes are both adapted to their physical environment, and are productive and profitable within the markets they serve.

Australia has had a significant effect on imported genotypes through genetic selection. Because of its strict quarantine system Australia is free of the major international livestock diseases. This means Australia can make available to other countries a range of genotypes that have been selected for productivity and adaptation within its environmental niches. The Merino sheep is an example of regional variation in genotypes adapted to environments ranging from southern temperate systems through Mediterranean systems to arid inland systems. Without development of commercially viable and environmentally adapted lines of Merinos it is doubtful if there would be substantial numbers of sheep in these areas at all. Development of commercially viable flocks is a major means of *in situ* conservation of genotypes that have immediate application to agricultural production. Cattle breeds have also been selected for tropical and subtropical systems based on relatively recent imports of *Bos indicus* and tropically adapted *Bos taurus* breeds and crossbreeds.

All the significant agricultural species in Australia have been imported from overseas: there have never been any ancestral landraces of agricultural animals in Australia. Australian genotypes have developed under Australian conditions of management and environment from readily available overseas genotypes. There has never been direct conservation of landrace-type animals. Some genotypes, such as the 19<sup>th</sup> century "Macarthur" Merinos are now conserved for historical reasons, rather than for agricultural purposes.

Although farm animals in Australia have been derived from overseas breeds, without extensive genetic analysis it cannot be established whether any Australian genotype is representative of the whole parent breed or merely a sub-population of that breed. The significance of the loss of rare breeds in Australia, when the same breed still exists overseas is therefore difficult to quantify. Without extensive genetic analysis it is also difficult to say whether Australian genotypes have deviated significantly from their overseas parent breeds. In breeds with large numbers in Australia, such as the Merino sheep, production data indicates this population may have developed significant production advantages over the populations from which it was derived.

Conservation of rare breeds in Australia is largely in the hands of private breeders and breed societies, or Non-Government Organisations (NGOs) such as the Australian Rare Breeds Trust. These special interest groups support *in situ* and on farm conservation of breeds through breeding plans and genetic advice. *Ex situ* conservation is effected through gene banks maintained by breeding companies and conservation NGOs.

A list of rare breeds in Australia is given in Appendix 3, derived from the database of the Australian Rare Breeds Trust. Population size is generally shown as the number of registered females of breeding age, though there may be additional animals that are not registered. The risk status of breeds is usually assessed by Breed Societies and NGOs such as the Australian Rare Breeds Trust. The number of registered breeding females is usually the arbiter of status, for instance the status of

sheep breeds is classed as Critical when there are 500 ewes or fewer, Rare when there are between 500 and 1500 ewes, and Vulnerable when there are between 1,500 and 5,000 ewes.

### **Characterisation and information systems**

Most pure breeds of farm livestock in Australia are recorded in registration systems by breed societies. Performance recording and genetic evaluation programs, including Best Linear Unbiased Prediction (BLUP) analysis, are carried out by breed societies or industry based organizations which may receive Government support and/or levies from individual producers. Large commercial companies often maintain their own recording and evaluation schemes.

Extensive information relating to pedigree and production characters of large numbers of stud and commercial animals exists. This information is usually maintained in computerised databases set up under cooperative arrangements between farmer groups, breed societies, government instrumentalities, the Rural Research and Development Corporations and scientific institutions. The influence of this co-operative system is pervasive within livestock systems and will be referred to again in this document.

The information relating to stud and commercial animals is supported by more detailed information derived from research programs within the research institutions. The characterisation of Australian livestock is therefore extensive and accurate and is used to inform many sophisticated genetic selection schemes. There is an increasing reliance on data at the molecular level to identify DNA markers and genes that are directly involved in production processes. This technology is extremely powerful in underpinning pedigree studies, phenotypic characterisation and selection strategies. This capability, coupled with extensive knowledge of tropical and subtropical production systems, makes Australia one of the best placed nations in the world to undertake characterisation studies of animals in developing countries with a view to developing strategies for conservation and utilisation of AnGR.

The knowledge system that underpins the genetic improvement of livestock is facilitated by the Association for the Advancement of Animal Breeding and Genetics (AAABG) and the Australian Society of Animal Production (ASAP), groups that include professional scientists and producers. These form an important part of the institutional arrangements that promote the conservation and utilisation of AnGR.

## **1.3 Assessing the state of utilisation of farm animal genetic resources in Australia.**

Australia has a long history in developing breeds suited to its unique environment. In doing this it has developed a variety of world class selection techniques at farm, breed and industry level. Adoption of these tools by industry has been widespread and has resulted in large increases in productivity and product quality in the last 60 years. This effect is notable in all the major production species, beef and dairy cattle, meat and wool sheep, pigs and poultry. The primary objective of selection has been to increase productivity, although selection for health and fitness has always been a priority, contributing to the welfare status of the animals. This has arisen largely because of Australia's unique environment where production systems are commonly extensive pastoral systems, or where climate has effects even on intensive systems (e.g. heat).

The products of these systems are aimed at the mass market with its requirements for consistent quality and safety, and they provide the major portion of the food and fibre supplied to the domestic and export markets.

## **Mainstream breeds.**

Many breeds in this category are influenced by current international genotypes. Although importation of genetic material into Australia is restricted by Australia's strict quarantine procedures, periodic importations have ensured that the Australian population of many livestock breeds is effectively part of the international population. This is particularly so for poultry and cattle, but also for sheep, goats and pigs.

Australian research has focused on selecting the most efficient and profitable animal populations from the gene pools present in Australia through the use of sophisticated genetic selection schemes. An overview of numbers of animals in registered mainstream breeds of sheep, cattle and pigs is given in Appendix 3.

## **The dairy industry**

The dairy industry is dominated by the Holstein, and has small inputs from other breeds including the Jersey, Guernsey, Illawarra and Ayrshire. Genetic selection is predominantly through the Australian Dairy Herd Improvement Scheme (ADHIS). The core activity of ADHIS is to calculate Australian Breeding Values (ABVs) for dairy traits. ADHIS maintains a national database of performance and pedigree details for individual dairy animals. This is regularly updated with data collected by milk recording organisations and breed societies. The database is used to assist genetic improvement in the dairy industry by artificial breeding companies and dairy farmers. The genetic evaluation is now conducted with an animal model for all yield, conformation, workability and survival traits. ADHIS participates in international evaluations with Interbull and also releases Australian Breeding Values (ABVs) for foreign bulls.

The rate of genetic gain has increased significantly since 1983 when farmers began utilising ABVs. Each year the genetic merit of artificially bred cows is increasing by about 1%. The value of these gains to the industry is approximately \$20 million per year.

## **The beef industry**

In the beef industry the established British breeds are dominant in the temperate south of Australia while *Bos indicus* and sanga breeds and their crosses are dominant in the tropical and sub-tropical north. European breeds have become more common in the last 40 years and have commonly been used in cross breeding, and as terminal sires. This has occurred predominantly in the temperate areas and to a lesser degree in the sub-tropical and tropical regions.

The beef herd employs a number of strategies for maintaining quality and productivity. Purebred cattle are generally associated with a breed society and almost universally these societies maintain sophisticated selection schemes and performance testing for many traits related to production.

Systematic crossbreeding, based on recognizable breed populations, is becoming common in the beef industry and includes a range of rotational and terminal crossbreeding strategies. There is extensive performance recording and selection for those animals that most efficiently meet current market needs.

Genetic selection in the Australian beef industry is world class using modern genetic evaluation systems such as BREEDPLAN which among other things provides Estimated Breeding Values (EBVs) for a range of traits including:

**Weight**

Birth weight  
200-day milk  
200, 400 and 600-day weights  
Mature cow weight

**Fertility**

Scrotal Size  
Days to Calving  
Gestation length  
Calving Ease

**Carcase**

Carcase weight  
Eye Muscle area  
Fat thickness  
Meat Yield %  
Marbling

Included in the calculation of EBVs are the animal's own performance, the performance of known relatives, the heritability of each trait and the relationship between the different traits, as with ADHIS, BREEDPLAN is a world-class genetic evaluation system.

All breeds of beef cattle in Australia use BREEDPLAN. For most, the BREEDPLAN genetic evaluation system has been integrated with the respective breed association's pedigree system. Substantial genetic improvements for traits of commercial importance have been demonstrated. The BREEDPLAN technology is highly regarded in a number of overseas countries where it has been adopted, eg New Zealand, Thailand, Philippines, USA, Canada, Argentina and the United Kingdom.

Genetic databases for particular breeds in these countries are now being merged to conduct international genetic evaluations. The rationale for this is simple - the larger the population of cattle being evaluated, the higher the chance of finding elite genetic material which can then be rapidly disseminated using modern artificial breeding techniques. This will improve the competitiveness of beef production in all co-operating countries.

**The sheepmeat and wool industries**

Systematic crossbreeding, based on recognizable breed populations, is normal in the meat sheep industry and includes a range of rotational and terminal crossbreeding strategies. There is extensive performance recording and selection for those animals that most efficiently meet current market needs for carcasses and wool type.

LAMBPLAN is Australia's major system for genetic evaluation in the sheepmeat industry. The system is based on estimated breeding values (EBV's) calculated from performance and pedigree information collected from breeders' flocks, using an approach similar in principle to that used in ADHIS and BREEDPLAN.

Implementation of genetic evaluation programs is not as widespread in the wool sheep industry, reflecting a range of sociological and political characteristics of the industry. Harmonisation of performance recording is increasing with LAMBPLAN providing a common industry base. Research is investigating enhanced techniques in both conventional selection and molecular genetics. Conventional non-quantitative techniques for sheep selection have been practiced widely in the sheep industry since its inception. They include visual and tactile appraisal by professional sheep classers; and "biological" selection approaches such as 'Elite' and 'soft rolling skin'. The molecular approach aims to create genetic tools to determine the presence or absence of particular genes with a major impact on traits affecting wool production and sustainability.

## **The pig industry**

The Australian pig industry has undergone extensive structural change in the last 50 years from an industry with many small producers associated with dairy farms and using skim milk as a major feed stuff, to large scale vertically integrated operations based on grain feeding. Since 1960, the number of pork producers has fallen from almost 50,000 to fewer than 3,000 in 2002. Although there was a rise in the number of breeding sows in the national herd between 1960 and 1972, the numbers have remained fairly stable over the last 30 years, varying between 300,000 and 350,000 sows. The average herd has grown from 4.3 sows per producer in 1960 to 135 sows per producer in 2002. In the same time, the number of breeding sows being registered with the Australian Pig Breeders Association has fallen across all breeds, signifying the shift from traditional stud breeders to commercial breeding companies as the source of commercial breeding stock.

The commercial pig industry is focused on production from hybrids based upon lines or breeds of global importance. Hierarchical pyramidal structures with nucleus breeding stocks of improved purebred populations supply multiplier units where parent hybrids are produced. Breed type in pigs has changed from almost exclusive dependence on the Large White and Landrace breeds to a greater use of the Duroc. World-class genetic selection tools such as PIGBLUP are used to accelerate the genetic progress of nucleus herds thereby increasing the sustainability and profitability of commercial production. As with ADHIS, BREEDPLAN and LAMBPLAN, PIGBLUP utilises BLUP analyses. This tool is used in both large and small nucleus pig herds.

Vertical integration and the emergence of large-scale companies have led to several companies dominating pork production in Australia. Three genetics firms (Hyfarm Pty Ltd, PIC Australia, and Cefn Genetics) dominate the supply of commercial crossbred breeding pigs to the Australian industry. While the emergence of major companies specializing in sales of boars has led to the industry relying on a relatively small number of sources of pig genetics, these sources are based on large populations.

## **The poultry industry**

Poultry are maintained as strains rather than breeds and the large-scale commercial operations which dominate the Australian industry rely almost exclusively on genotypes purchased from major international providers. The poultry breeding industry is focused on the production of hybrids based upon 6-8 breeds of global importance. Local operations are responsible for hybridization and multiplication, in a similar structure to the pig industry. Six chicken breeding companies are responsible for 85% of global output, and two turkey companies for 98% of output.

## **Rare breeds**

Information on the composition of rare breeds is shown in Appendix 3. They are generally uneconomic and rarely involved in large scale production.

Rare breeds in Australia are often seen in the realm of agricultural shows and other exhibitions and competitions where they are judged according to “type” and “breed standards”. Genetic selection in these breeds generally serves these ends and is often intensely familial in nature within the breed. They are primarily maintained as a hobby.

## **1.4 Identifying the major features and critical areas of AnGR conservation and utilisation.**

### **Functionality and environmental adaptation**

Functionality and environmental adaptation of animals are key considerations in conservation and utilisation of AnGR in Australia.

The mainstream breeds and strains are continually responding to the application of intensive selection pressure for high yield, aided by modern technologies and the global exchange of breeding stock. In some countries this selection has led to a loss of functional characteristics, such as the ability to stand with normal posture or to walk moderate distances. There have been occasional instances of this in the intensive pig and poultry industries in Australia, but in the Australian situation, these occurrences risk contravention of regulations for animal welfare, incur extra costs for remediation and diminish product quality. Australia values high standards of animal welfare and our husbandry systems have been developed to meet this objective. Functional characters such as general health, conformation and fitness are selected for to maintain high levels of welfare and productivity.

Functional characters are essential in the pastoral industries, which include the beef, dairy and sheep industries. They are key to efficient production and the high standards of health and welfare that production requires and the community expects. Australian pastoral genotypes are noted for their hardiness and high level of adaptation to their environments. Loss of functional characters is not an issue for these industries.



## **CHAPTER 2 ANALYSING THE CHANGING DEMANDS ON NATIONAL LIVESTOCK PRODUCTION AND THEIR IMPLICATIONS FOR FUTURE NATIONAL POLICIES, STRATEGIES AND PROGRAMS RELATED TO AnGR**

There have been dramatic changes in consumer spending patterns on food over the last 50 years. The biggest trends have been a fall in the consumption of meat and meat products and an increase in the amount of fruit and vegetables consumed. In addition, the types of food and food products Australians are consuming have also changed. Australians now consume a greater variety of foods, driven by a move towards a more multi-cultural diet. In particular, influences from Mediterranean and Asian diets have changed the way Australians cook. More recently, there has been a notable trend towards fresh packaged produce and pre-prepared food. These trends have been driven by a rise in disposable income and reduction in the time dedicated to food preparation. These changes in consumer spending will influence breeding policies across all of the major meat animal species.

### **2.1 Reviewing past policies, strategies, programmes and management practices (as related to AnGR)**

The pressures on Australian agriculture over the past 50 years have driven the industry towards greater intensification and efficiencies. Although this pressure has been largely driven by the need to compete in the global sector, domestic pressures have also contributed. As a result, diversity of breeds across the livestock sector has been reduced, particularly in the more intensive pork and poultry industries.

However, unlike many countries with a long history of agriculture, the Australian rural industries are still relatively young. A consequence of this is that Australia does not contain many unique domestic breeds, as our main breeds are all derived from exotic genetic material. Selection in Australia has resulted in genotypes that are adapted to the unique Australian environment but few of these genotypes are considered unique breeds.

While there is still a relative diversity of breeds in the sheep and cattle industries the poultry, pig and dairy sectors rely on a limited number of breeds, and these are all of exotic origin and have been strongly influenced by imports of North American and European genetic material.

AnGR management in Australia relies on commercial breeding programs and breed associations.

### **2.2 Analysing future demands and trends**

The demands for the future that will shape AnGR in Australia are:

1. Economic pressure on the livestock industry to compete internationally.
2. International demand for meat, wool and dairy products.
3. Increasing environmental regulation.
4. Regulations on animal care, welfare and management (e.g., cage size for poultry).
5. The impact of imported livestock products on the domestic industries.

Some trends in the roles of AnGR can be predicted from these broad demands.

While the size of the Australian dairy herd has remained stable over the last few years, except for a small drop during the recent 2002/03 drought, the average number of farms has decreased

dramatically, accompanied by a compensatory rise in the average herd size. Milk production per cow, while experiencing strong increases throughout the 1980s, has levelled in recent years. The average lactation per cow per year is around 4800 litres (Source: Australian Bureau of Statistics and Dairy Australia). Future trends in the decline in farm numbers and increases in herd size are likely to continue, as producers will need to further increase productivity to maintain competitiveness in world markets.

Unless there is an improvement in the world wool price from 2004 levels, sheep numbers are likely to continue to decline. The Australian sheep flock is currently at its lowest level in over 50 years. However, the industry is currently undergoing something of a transformation as the price of sheep meat has improved steadily over recent years. This is driving a shift away from traditional wool producing breeds such as the Merino. The poor world wool price is also driving a shift towards increased beef production.

The size of the Australian beef herd increased steadily up until the 2002-2003 drought. The recent drought in Australia resulted in a reduction in beef cattle numbers, which will take several years to rebuild.

The pig industry is currently experiencing difficulties competing with cheap imports from several nations. The pressure on the pork industry will be to improve productivity in order to compete both at home and abroad. Growth of poultry meat consumption has continued for several decades, making it the second most favoured meat in Australia after beef. This trend is likely to continue.

The growth in global demand for livestock products as *per capita* incomes increase around the world is likely to stimulate strong demand for improved breeding stock. Australian producers will continue to meet this demand by domestic breeding programs and the importation of exotic genetic material. The demand for Australian produce is likely to remain strong as the Asian region, particularly China, increases its consumption of meat products. In particular, the growth of the Asian and Middle-Eastern markets is likely to maintain demand for live exports of sheep and cattle and, increasingly, goats and camels.

The increase in demand for organic and specialty meat products is likely to continue as consumers become increasingly discerning about what they eat. This trend is likely to be driven by the trend for consumers to 'eat out' more, and treat food as part of the entertainment package. This trend will drive some parts of the production system towards increased flavour and tenderness, rather than simply increased productivity or feed conversion rates. Producers will be paid a price premium for these products.

There is the potential for global warming to impact on Australia's AnGR. Although rainfall trends are currently uncertain, it is likely that most of Australia's productive land will experience increases in temperatures. This may influence the selection of cattle and sheep breeds, with selection favouring those breeds that are more drought tolerant and better able to withstand higher temperatures. In addition, it is possible that global warming will result in a shift towards alternate stock species, particularly in arid regions. For example, there may be an increased emphasis on goat harvesting, as goats are generally better browsers than sheep and are able to survive in harsher environments.

## **2.3 The conservation, use and development of AnGR.**

Within Australia, most important commercial AnGR are maintained by commercial breeding organisations and stud farms. These groups safe-guard important AnGR and key breeds in response to commercial needs. It is recognised that many commercial livestock populations could be re-

stocked from abroad if needed. Of the exotic breeds in Australia that could be considered endangered internationally, most are maintained by enthusiasts.

The dairy, pig and poultry sectors generally rely on mainstream globalised breeds. These breeds rely on regular international exchanges of genetic material. Breed development, particularly in the pig and poultry industries, is largely controlled by private breeding companies supplying multi-national markets. For this arrangement to remain, the future development of these breeds must be in accordance with Australian domestic policies and regulations (e.g., reflecting animal welfare considerations and rules on genetic modifications and cloning).

Beef and sheep breeds are less globalised but still have significant input from international sources. Australia is also a source of AnGR to the international community, largely as a result of the extensive breeding and selection of unique Australian breeds from imported genotypes. The Australian Merino is a notable example of this. Sheep and cattle genotypes are generally considered to be well managed in Australia and the total number of registered animals is sufficient to not warrant special conservation programs. Some sheep and cattle breeds are no longer of wide-scale commercial importance and could, in the future, reach sufficiently low levels to be considered potentially threatened. Currently enthusiasts maintain these breeds.

Although the emphasis of commercial breeding will remain on maximising sustainable productivity, there will be increased consideration given to traits associated with animal welfare and product quality. In particular, there is continuing work to breed stock that are more productive in Australia's dry and variable climate. While this process relies heavily on exotic AnGR, it also utilises Australia's strong capacity in developing breeds suitable to our domestic situation.

## **2.4 Outlining future national policy, strategy and management plans for the conservation, use and development of AnGR.**

The Australian Government policy in regard to conserving AnGR is to create the enabling environment through which the owners and users of AnGR can jointly determine the breeding and conservation programs for their own industry. Partnerships between industry and government through research and development activities provide a key mechanism through which to determine future priorities and actions for the conservation, use and development of AnGR. The conservation of commercially important domestic AnGR is handled by breeding organisations and commercial enterprises while enthusiasts and small commercial enterprises conserve breeds that are of less economic importance.

## **CHAPTER 3 REVIEWING THE STATE OF NATIONAL CAPACITIES & ASSESSING FUTURE CAPACITY BUILDING REQUIREMENTS.**

### **3.1 Assessment of national capacities.**

#### **Institutional system**

Australian Government policy is based on creating self reliant industries which use public funds, industry levies and private funds to create appropriate infrastructures and deliver the services to industry that industry itself determines. This includes research and development in genetic selection and delivery of appropriate services to industry. Technology transfer to farmers in the field of AnGR has largely been taken over by commercial companies and industry owned organizations, in many instances through government and industry partnerships in research and development.

Australia has developed a system of industry based Rural Research and Development Corporations (RDCs). These enable relevant government and industry producers, processors, exporters and retailers to work in partnership in building strong competitive self reliant industries. The Australian Government is a major contributor, providing dollar-for-dollar funds for money spent on R&D.

The world class genetic evaluation programs that play a major role in ensuring the efficiency of animal based agriculture in Australia have been largely developed and implemented through the actions of various RDCs related to animal industries. Individual breed societies, producer groups and some NGOs have also been instrumental in the development and implementation of these programs. These groups also have a voice in determining the objectives of the breed and decide on courses of action to improve or enhance the breed. They generally act in concert with the RDCs and there is ready exchange of data and services amongst the groups.

A brief description of the major genetic evaluation programs was given in Chapter 1, Section 1.3. More detailed information is available from the organizations' websites or by contacting the organizations directly.

<http://www.mla.com.au/>  
<http://www.woolinnovation.com.au/>  
<http://www.apl.au.com/>  
<http://www.dairyaustralia.com.au/>  
<http://www.mla.com.au/lambplan/>  
<http://www.adhis.com.au/>  
<http://breedplan.une.edu.au/>  
<http://agbu.une.edu.au/>  
<http://abri.une.edu.au/default.htm>

Through the Australian Bureau of Statistics, Australia maintains a national database of domestic animals which includes basic data of numbers of breeding males and females. A detailed census of livestock is carried out every 5 years, supported by smaller surveys in the intervening years. Information is collected from commercial farms (those with annual turnover estimated to exceed \$A 22,500).

A National Livestock Identification Scheme (NLIS) is being progressively implemented in Australia from 1<sup>st</sup> July 2004. It incorporates individual animal identification for high value animals

(e.g. cattle) and flock identification for animals of lower individual value (e.g. flock ewes). It is proposed this system will provide a whole-of-life record of animal movement and ownership with potential to be linked to pedigree data, production performance and DNA samples taken at slaughter. Close cooperation and interaction with breed and industry bodies is proposed to maximize the returns from this investment. The NLIS is expected to have a major role in ensuring food safety, product integrity, market access assurance and tracing animal movements for disease management.

### **Performance recording, genetic evaluation and genetic improvement**

Genetic evaluation programs are in place for many industries and breeds. A large percentage of breeders use these programs, including breeders with unregistered herds and flocks. Computerized performance records facilitate this widespread uptake. Gene flow of improved material through the industries is quite effective through natural mating and artificial insemination involving males selected on the basis of EBVs. Goals and genetic trends are available and reviewed regularly to meet breeder and market objectives.

The recording of a large number of traits in the performance recording schemes enables breeds and strains of breeds to be defined biologically with a high degree of accuracy. This is of considerable value when matching genotypes to particular environmental niches, as well as production niches.

There is increasing interest in genetic resistance to disease, exemplified by the “Golden Ram” project where resistance to gastro-intestinal worms appears to be determined in part by a gene of large effect.

### **Capacity building requirements for the future**

Capacity building requirements for the future will depend to a great degree on the sustainability and longevity of the current form of each animal production system. As market demands change and technology allows new production systems to emerge there will be continuous change in animal production systems. This change will occur partly because of existing capacity but will also require development of new capacities.

It is anticipated that in the next decade livestock farming in Australia will experience continuing intensification of animal production systems in both the traditional “intensive” industries, and in grazing systems in the higher rainfall zones.

Heavy reliance on grain feeding systems will continue to dominate the pig and poultry industries. The housing and husbandry systems in these industries may change to allow more “natural” behaviours and improve the efficiency of production. This may involve greater space allocations per animal or environmental enrichment, or both. There does not seem to be any alternative to grains as the dominant feed source in these systems.

The beef industry is predominantly pastoral with the breeding herd almost exclusively reliant on pasture. Some innovative forage based systems using leucaena and other shrubs have been developed to broaden the plant base available for grazing and browsing. The feedlot section of the beef industry is essentially a “finishing” operation, with about 30% of slaughtered cattle having been finished in a feedlot. Feedlot rations are generally based on grain with harvested forage contributing to roughage requirements.

The dairy industry will continue to use grain-based feeds as supplements to maintain high feed intakes and compensate for seasonal deficiencies in pasture quality. The proportion of the diet based

on grain may increase, depending on seasonal conditions and grain prices, although the low cost base of the Australian dairy industry is largely reliant on pasture production and this will continue to be the major feed input for the dairy industry. Some individual dairies are already highly reliant on grain feeding where pasture production is not a viable option. These dairies tend to exist in dry and remote locations, or close to urban centers where land availability is a problem. These types of operations are a very small part of the dairy industry. Overall, the industry will continue to be pasture based, with supplementary grain feeding. Genetic programs will continue to select animals for this environment.

The sheep industry is essentially pastoral in nature. In areas with adequate rainfall there is a trend to increase the use of improved pastures. With appropriate management of pastures and grazing, the carrying capacity in these areas can be significantly and sustainably increased. This type of pastoral intensification is particularly relevant to the sheep meat industry. There are few feedlots for finishing sheep, with most meat sheep finished at pasture. The wool industry is almost entirely based on pastures. A very small number of sheep are fed in sheds to supply elite fine wool that is free of dust and vegetable fault.

While future requirements for animal genotypes and industry services arising from research and development cannot be known with certainty, there is considerable confidence that the major requirements over the next 10 to 20 years have been identified. The broad pictures of industry change given above have arisen from industry knowledge of their present state and the pressures to which they are expected to be exposed in the future.

### **Information and communication**

Building of capacities to service future environments will be assisted by the maintenance of an effective network of all sectors in the livestock industry (breeders, breed societies, research institutes, conservation NGOs, and commercial organisations), by the effective employment of existing human resources, and by remaining informed of international developments. The current arrangements for data harmonization and sharing in Australia, operating through government, RDCs, universities and CSIRO appear to be well placed to provide future capacities for Australian animal industries.

### **Human resources, education and research facilities**

Australia has a major asset in its research and education system and the human resource base involved in agricultural research and development. The sector is recognized as being world-class across the broad spectrum of agricultural sciences and makes a large contribution to both domestic and overseas activities. There is no indication that the number of Australians being trained in agricultural sciences is insufficient for current or future needs.

Professional societies, e.g. the Association for the Advancement of Animal Breeding and Genetics (AAABG) and the Australian Association for Animal production (ASAP), also play an important role in information exchange and provide a forum in which major issues associated with the Australian livestock industries can be debated and their profile raised amongst decision makers. Recommendations from these groups are made to appropriate authorities for their consideration.

Australia, through the Australian Centre for International Agricultural Research (ACIAR), AusAID and other privately and publicly funded programs is involved in training overseas scientists and helping overseas countries develop their agricultural systems. A particular focus is on Australia's near neighbours in the Pacific and South East Asian region, although Australian staff and expertise

are involved in training, research and development projects around the world. Australia is unique in being a developed nation with large areas of agricultural lands in the tropics. Australian science relating to tropical agriculture can be transmitted to similar situations in developing countries.

## **CHAPTER 4 IDENTIFYING NATIONAL PRIORITIES FOR THE CONSERVATION AND UTILISATION OF AnGR.**

Previous chapters have highlighted various institutional arrangements through which national cross cutting issues can be addressed and through which national priorities are identified.

Under Australia's Federal system of government, States and Territories have the prime responsibilities in agriculture and natural resource management. The Australian Government plays a facilitating role in addressing issues which require a national response. Ministerial Councils and the research and development corporations are the key national coordination mechanisms through which national cross cutting issues involving animal genetic resources can be addressed.

National issues which have been addressed through RDCs involving matters of a cross cutting nature are

- Improving the information infrastructure through recording schemes and appropriately linked databases to address the increasingly complex livestock objectives required to meet the needs of society and commerce.
- Training in genetic management and the operation of livestock conservation and improvement schemes.
- Technology transfer. For example, Dairy Australia, Meat and Livestock Australia and Australian Wool Innovation fund information programs for all animal producers. They fund individual research programs in collaboration with breeding companies and research institutes into the identification of useful genetic management and selection techniques for livestock improvement programs and new approaches to the sustainable use of genetic variation in livestock.
- Increasing availability of information on performance standards for breeds and training in whole chain marketing and awareness campaigns is important for this activity.
- Cryopreservation of genetic material for the preservation of genetic variability. Gene Banks are maintained by some bull breeding companies, pig breeding companies, and several NGOs.



## **CHAPTER 5 FORMULATING RECOMMENDATIONS FOR ENHANCED CO-OPERATION IN THE FIELD OF FARM ANIMAL BIODIVERSITY.**

### **International and regional co-operation**

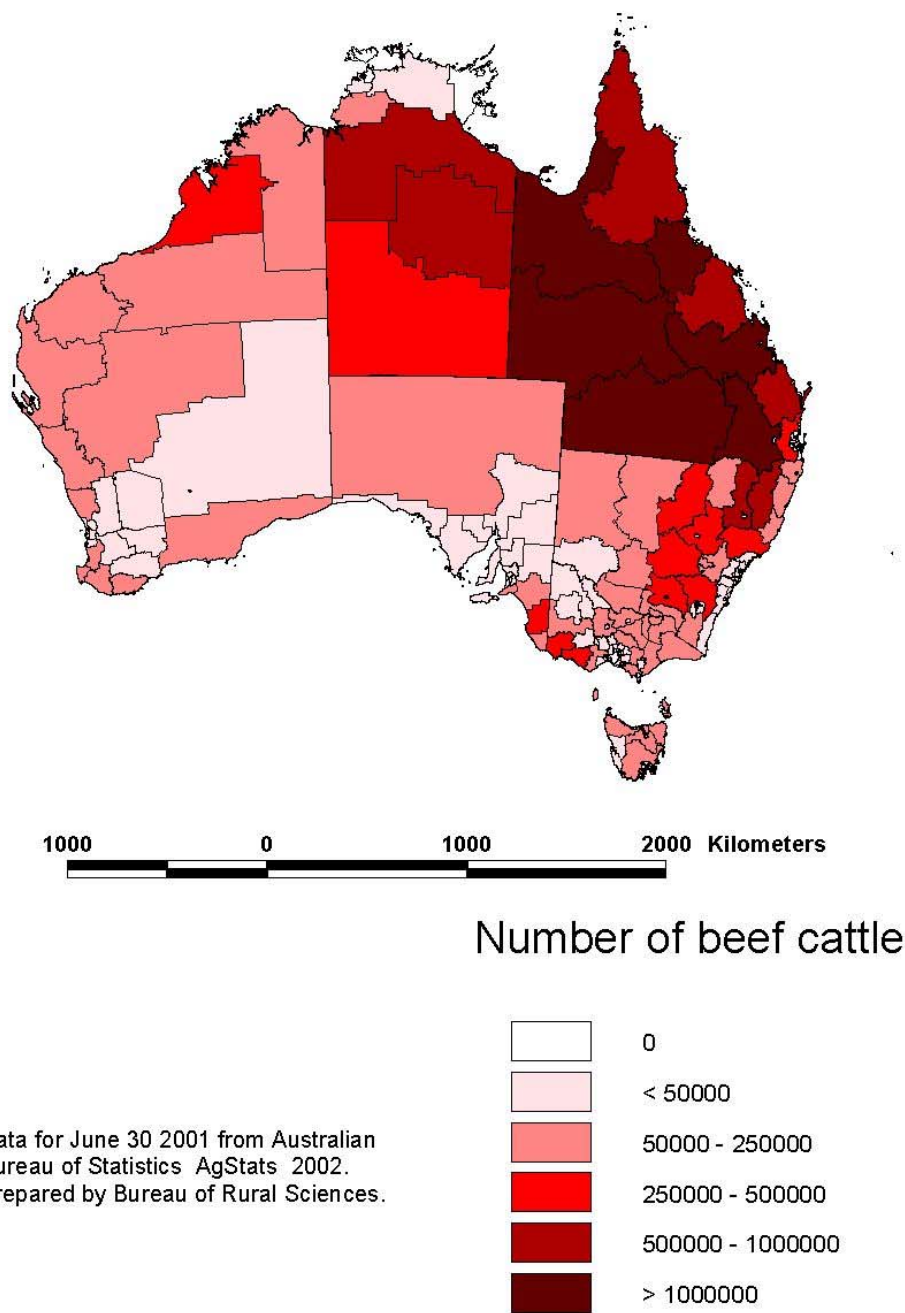
Australia participates in a range of international and regional fora in which genetic resources issues arise. This includes an extensive development assistance program, including regional fora and under bilateral arrangements.

Australian researchers and industry, through their considerable expertise in the management of animal genetic resources and their use in food and agriculture production are potentially able to participate in appropriate technology transfer and capacity building activities.

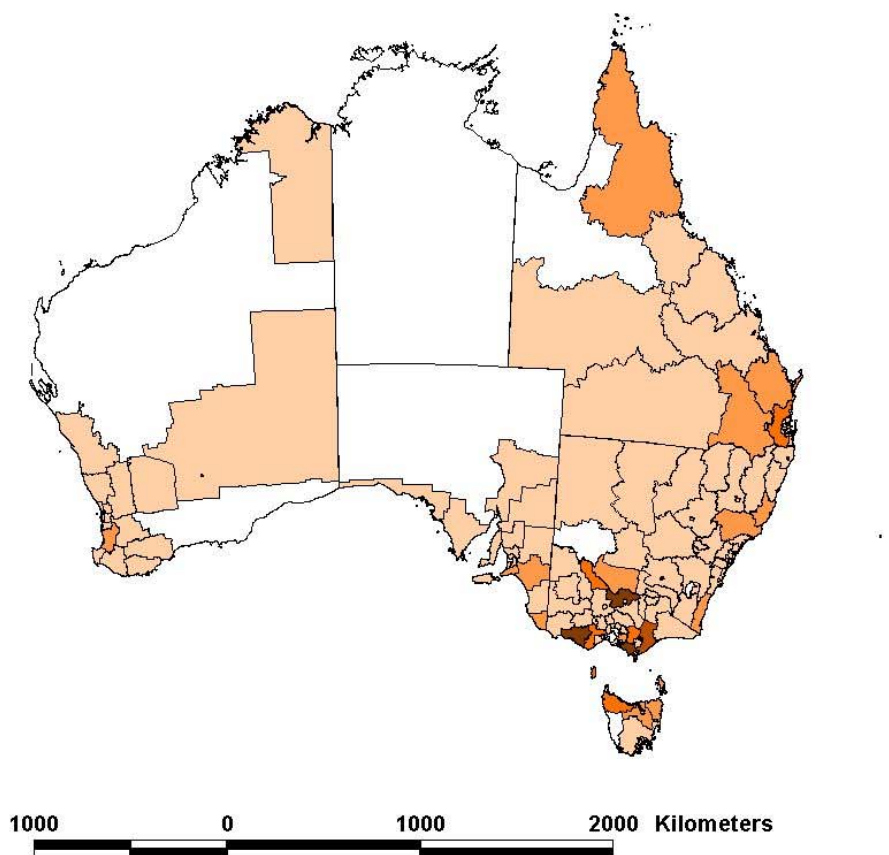
Australian technical capacity in the field of AnGR management is well developed. World-class genetic evaluation techniques are used in breed development in all commercial sectors and processes uniquely adapted to Australian conditions might potentially contribute to solving AnGR conservation and use problems in other countries.

**APPENDIX 1 Distribution Maps of Major Species of Australian Livestock**

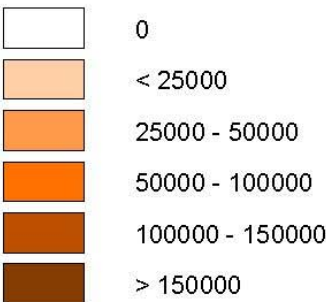
**Distribution of beef cattle in Australia - 2001**



# Distribution of dairy cows in Australia - 2001

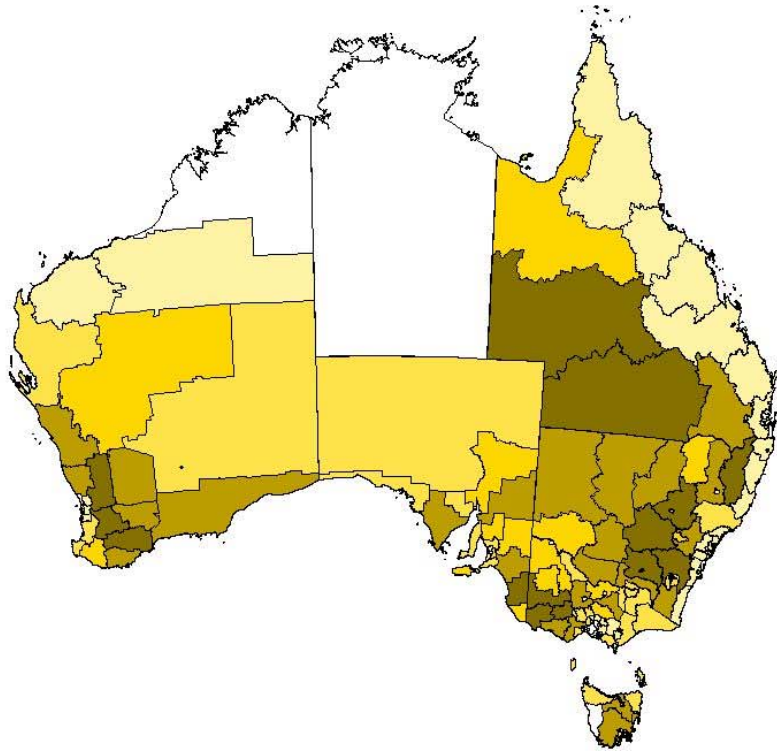


## Number of dairy cows



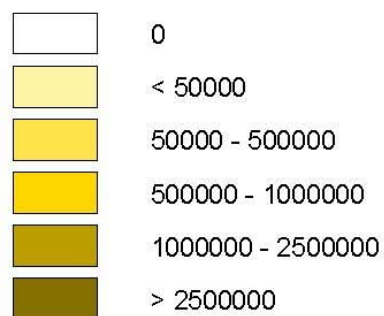
Data for June 30 2001 from Australian  
Bureau of Statistics AgStats 2002.  
Prepared by Bureau of Rural Sciences.

## Distribution of sheep in Australia - 2001



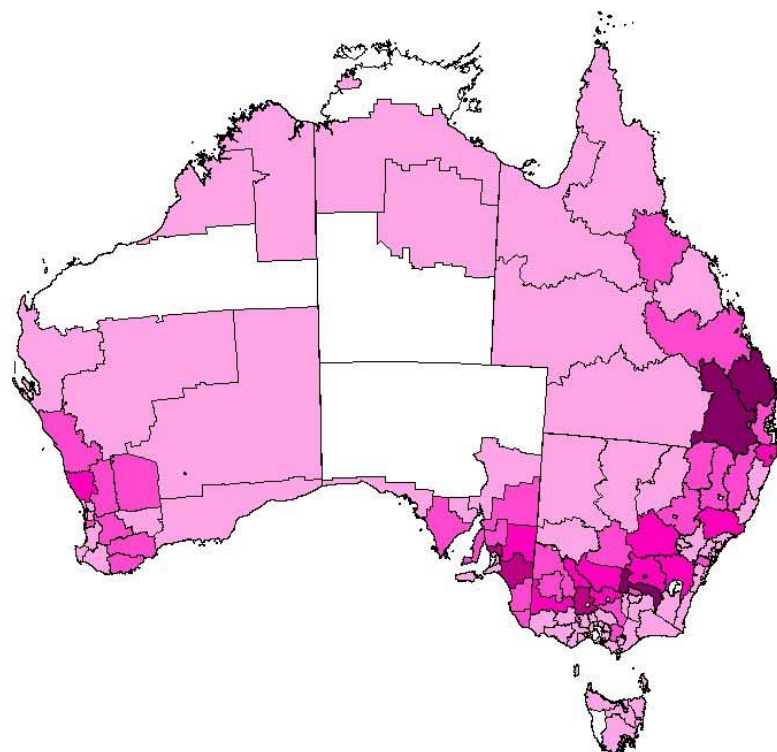
1000 0 1000 2000 Kilometers

### Number of sheep



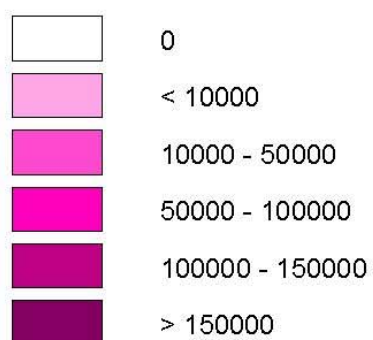
Data for June 30 2001 from Australian  
Bureau of Statistics AgStats 2002.  
Prepared by Bureau of Rural Sciences.

## Distribution of pigs in Australia - 2001



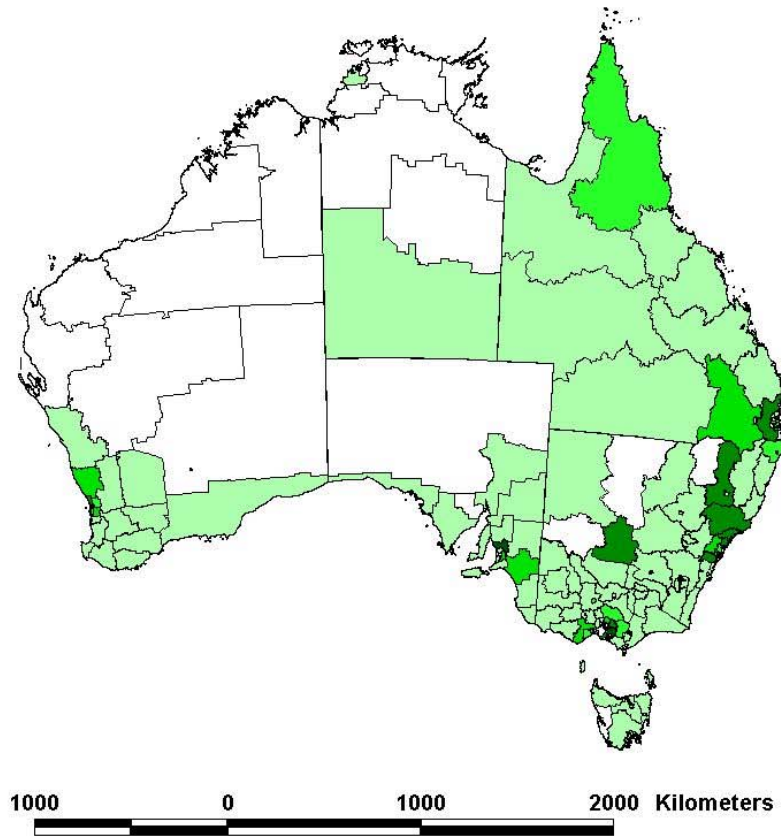
1000 0 1000 2000 Kilometers

### Number of pigs

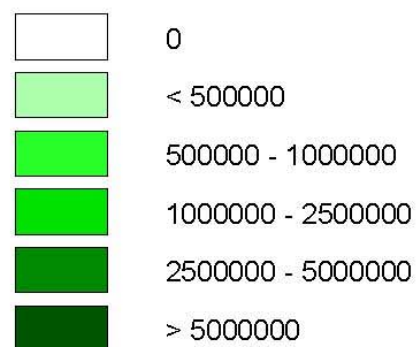


Data for June 30 2001 from Australian  
Bureau of Statistics AgStats 2002.  
Prepared by Bureau of Rural Sciences.

## Distribution of poultry in Australia - 2001



### Number of birds



Data for June 30 2001 from Australian  
Bureau of Statistics AgStats 2002.  
Prepared by Bureau of Rural Sciences.

## APPENDIX 2 Summary Statistics of Australian Livestock Industries

(Information in Appendix 2 sourced from “At a glance 2003 – Australian Agriculture, Fisheries and Forestry” published by the Australian Government Department of Agriculture, Fisheries and Forestry.)

### GROSS VALUE OF AGRICULTURAL COMMODITIES

(DOMESTIC WHOLESALE VALUE IN CURRENT A\$M, SOURCE: ABS)

	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02
<b>Livestock slaughtering and other disposals</b>						
Cattle and calves	3,597.0	4,138.2	4,476.6	5,048.7	6,430.6	7,142.4
Sheep and lambs	1,042.6	1,066.2	1,053.5	1,053.5	1,401.8	2,117.6
Pigs	764.8	709.8	689.7	791.7	822.3	967.7
Poultry	932.0	1,053.6	1,018.5	1,030.8	1,060.2	1,174.9
Total	6,376.3	6,991.9	7,255.8	7,944.2	9,737.8	11,434.5
<b>Livestock products</b>						
Wool	2,621.2	2,753.9	2,141.0	2,149.2	2,541.2	2,713.2
Milk	2,808.9	2,817.0	2,899.6	2,845.2	3,053.3	3,717.1
Eggs	274.9	347.5	337.1	313.1	332.7	320.4
Total	5,758.7	5,957.8	5,411.8	5,345.4	5,964.7	6,750.7

### BEEF AND VEAL – SUMMARY STATISTICS

		1999 -2000	2000 -2001	2001 -2002	2002 -2003
<b>World Production</b>					
Argentina	kt	2 880	2 640	2 700	na
Brazil	kt	6 520	6 895	7 240	na
China	kt	5 328	5 488	5 846	na
European Union	kt	7 462	6 896	7 456	na
United States	kt	12 298	11 983	12 427	na
Australia	kt	1 988	2 080	2 032	2 073
<b>Details of Australian Production</b>					
Cattle numbers	million	28	28	28	27
Cattle on feed, 30 June	'000	673	693	735	668
Slaughtering	'000	8 642	8 899	8 606	9 228
Saleyard price	Ac/kg	217	266	306	256
<b>Exports to: (shipped weight)</b>					
United States	kt	312	389	403	350
Japan	kt	326	336	243	277
Korea, Rep. of	kt	69	57	71	82
total	kt	852	959	902	902
value	A\$m	3 119	4 007	4 189	3 756
Live cattle	'000	846	846	797	969
value	A\$m	433	482	526	562
Saleyard price	Ac/kg	217	266	306	256

## SHEEP MEAT – SUMMARY STATISTICS

		<b>1999- 2000</b>	<b>2000- 2001</b>	<b>2001- 2002</b>	<b>2002- 2003</b>
<b>World Production</b>					
Australia	kt	714	658	635	na
China	kt	1 440	1 540	1 600	na
New Zealand	kt	540	562	521	na
Spain	kt	251	236	233	na
United Kingdom	kt	359	258	299	na
<b>Details of Australian Production</b>					
Slaughterings					
Sheep	'000	15 585	16 628	14 484	13 657
Lamb	'000	17 557	18 629	17 433	16 870
Production					
Mutton	kt	328	348	276	268
Lamb	kt	347	367	349	329
<b>Exports (shipped weight)</b>					
Mutton	kt	171	180	158	168
Lamb	kt	99	115	109	116
– to United States	kt	22	28	29	26
Export Lamb value	\$m	369	508	626	554
Live sheep	'000	4 859	5 936	6 443	5 843
Live sheep value	\$m	180	258	392	408
<b>Saleyard prices</b>					
Mutton	Ac/kg	61	101	183	167
Lamb	Ac/kg	187	201	314	361



## WOOL – SUMMARY STATISTICS

		<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>
		<b>-2000</b>	<b>-2001</b>	<b>-2002</b>	<b>-2003</b>
<b>World Wool production</b>	kt	1 376	1 357	1 316	1 245
Argentina	kt	63	62	60	60
Australia	kt	671	657	607	544
Central Asian					
Republics	kt	82	81	82	82
China	kt	283	291	294	296
New Zealand	kt	257	237	229	227
Wool exports	kt	872	914	770	655
<b>Australia</b>					
Sheep numbers	million	119	111	106	98
Sheep shorn	million	144	140	127	119
Wool production (gr.)					
shorn	kt	620	602	555	499
other	kt	51	55	52	45
total	kt	671	657	607	544
Total closing stocks (gr.)	kt	263	141	81	105
<b>Wool exports</b>					
(balance of payments basis)					
volume (gr. equiv.)	kt	803	855	686	505
value	A\$m	2 963	3 897	3 687	3 545
Market indicator (clean)					
eastern	Ac/kg	627	764	841	1 049
western	Ac/kg	506	619	762	1 032
Auction price (gr.)	Ac/kg	357	512	527	682

(gr; indicates greasy wool)

## DAIRY PRODUCTS – SUMMARY STATISTICS

		<b>1999 -2000</b>	<b>2000 -2001</b>	<b>2001 -2002</b>	<b>2002 -2003</b>
<b>World Production</b>					
Butter	kt	5 561	5 662	5 747	5 759
SMP	kt	3 298	3 294	3 507	3 060
Exports					
Butter	kt	638	630	613	611
SMP	kt	996	981	966	954
Prices					
Butter	US\$/t	796	1 293	1 152	1 186
Cheese	US\$/t	1 178	2 070	2 000	1 775
SMP	US\$/t	1 039	2 167	1 619	1 587
<b>Details of Australian Production</b>					
Cow numbers	'000	2 171	2 176	2 123	2 068
Milk yields	L/cow	4 996	4 846	5 309	4 991
Total milk	ML	10 847	10 545	11 271	10 322
Milk market sales	ML	1 936	1 920	1 916	1 916
Manufacturing milk	ML	8 911	8 625	9 355	8 406
Butter	kt	183	172	178	138
Cheese	kt	373	376	431	352
Whole Milk Powder	kt	187	205	239	170
Skim Milk Powder	kt	247	249	243	193
Milk price	Ac/L	26	29	33	30
Value of exports	A\$m	2 439	3 047	3 196	2 378

## **APPENDIX 3 Breed Composition Of Australian Livestock Industries**

(Information in Appendix 3 sourced from “Status of Rare Breeds of Domestic Farm Livestock in Australia 2004. Official Publication of Rare Breeds Trust of Australia (RBTA). Compiled by Fiona Chambers RBTA Director, June 2004.)

### **Beef Cattle**

In 2000 Australia had 24.4 million head of beef cattle of which 12.3 million were beef cows and heifers. These cattle were run over 76,662 properties suggesting an average herd size of 318 animals, though there is considerable variation.

The beef industry is the most important rural industry to Australia. Australia is the largest exporter of beef in the world. Approximately 66% of Australia’s total beef production is exported and the total value of exports in 2002-03 was approximately \$3.8 billion. The states with the largest populations of beef cattle are Queensland (11.5 million), NSW (5.5 million), Victoria (2.4 million), WA (2.1 million), SA (0.995 million), and Tasmania (0.411 million).

The Australian climate varies dramatically between north and south and the breeds of cattle vary accordingly. In the northern states and territories, *Bos indicus* cattle thrive in the tropical and sub tropical climates. In the more southern temperate states, *Bos taurus* breeds dominate. During the evolution of the industry in Australia, crosses between *Bos indicus* and *Bos taurus* breeds have led to a number of composite breeds that have become stabilised and widespread.

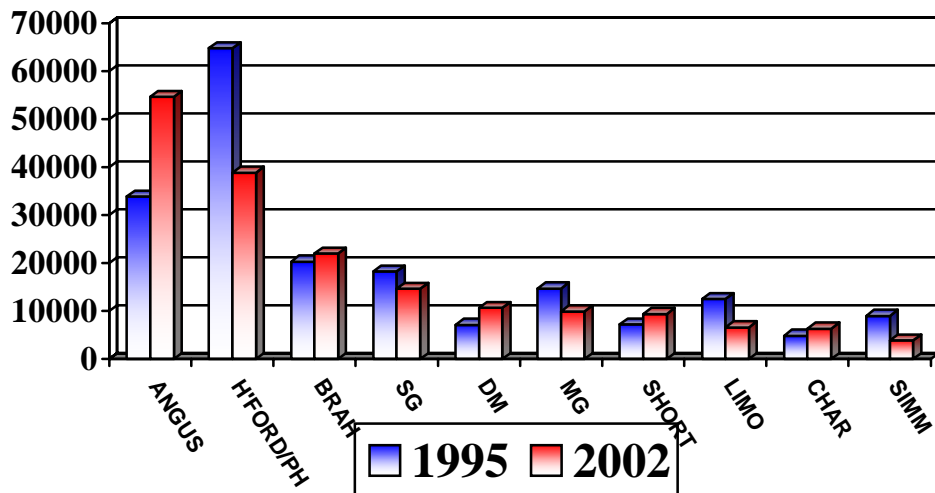
### **Breeds of Beef Cattle in Australia**

For many years around 25% of all pure-bred cattle in Australia have been Hereford. In addition, there is Hereford influence in over 50% of all crossbred beef cattle. Angus cattle have increased in popularity over the past decade with calf registrations increasing 129% between 1990 (24,401 calf registrations) and 2003 (55,837 calf registrations).

The table below shows the changes in registration numbers across 10 beef breeds. Annual registrations for half of the breeds: Angus, Brahman, Droughtmaster, Shorthorn and Limousin, have increased in number over the 7 years between 1995 and 2002. The other 5 breeds have all experienced declining registrations.

## BEEF BREED REGISTRATIONS IN AUSTRALIA 1995 AND 2002

(SOURCE: Australian Registered Cattle Breeders Association)

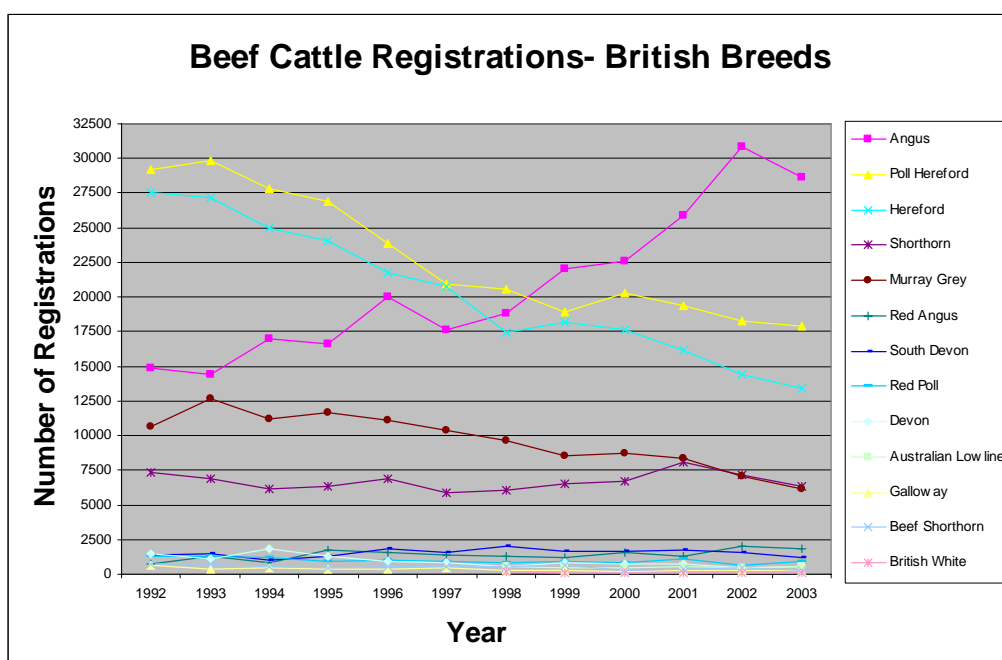


Together, the British breeds: Angus, Hereford and Poll Hereford, Shorthorn and Murray Grey cattle account for 57.1% of all beef cattle registrations in Australia. Tropical breeds: Brahman, Droughtmaster and Santa Getrudis cattle account for 19.3% of all beef cattle registrations. European breeds: Charolais, Limousin and Simmental account for 12.3% of all beef cattle breed registrations. The remaining 11.3% of beef cattle registrations are made up from 25 different breeds. An estimated 22 other beef breeds exist in Australia but either no longer run a stud registry or are not members of Australian Registered Cattle Breeders Association (ARCBA).

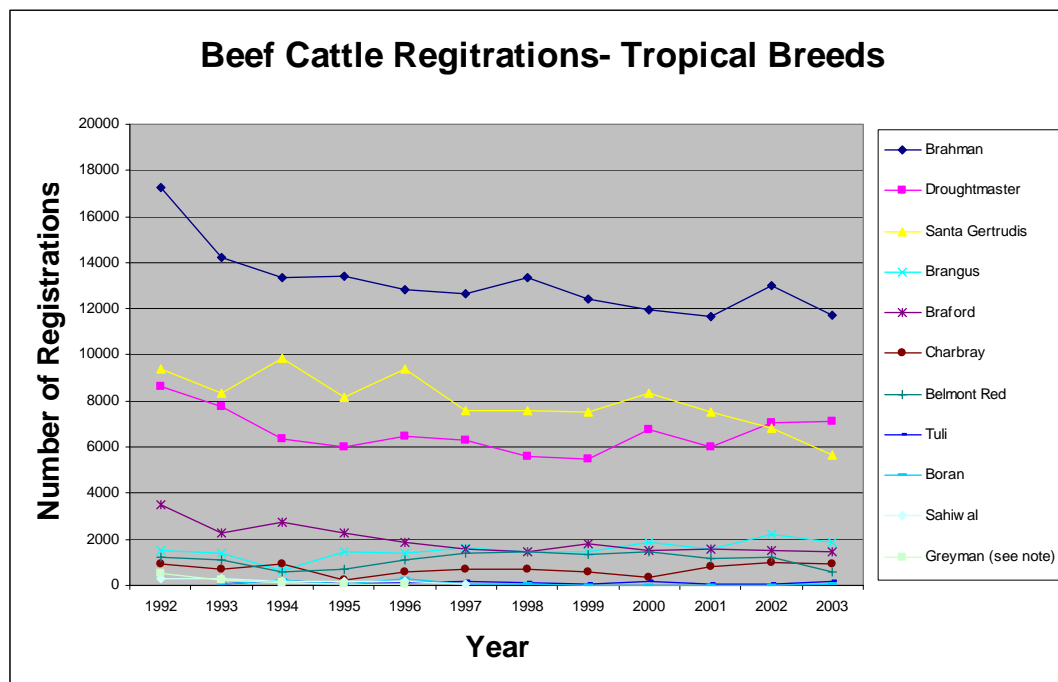
The tables below show the changing registration patterns across the three classes of beef cattle in Australia: British, Tropical and European breeds.

## BEEF CATTLE REGISTRATIONS – BRITISH BREEDS

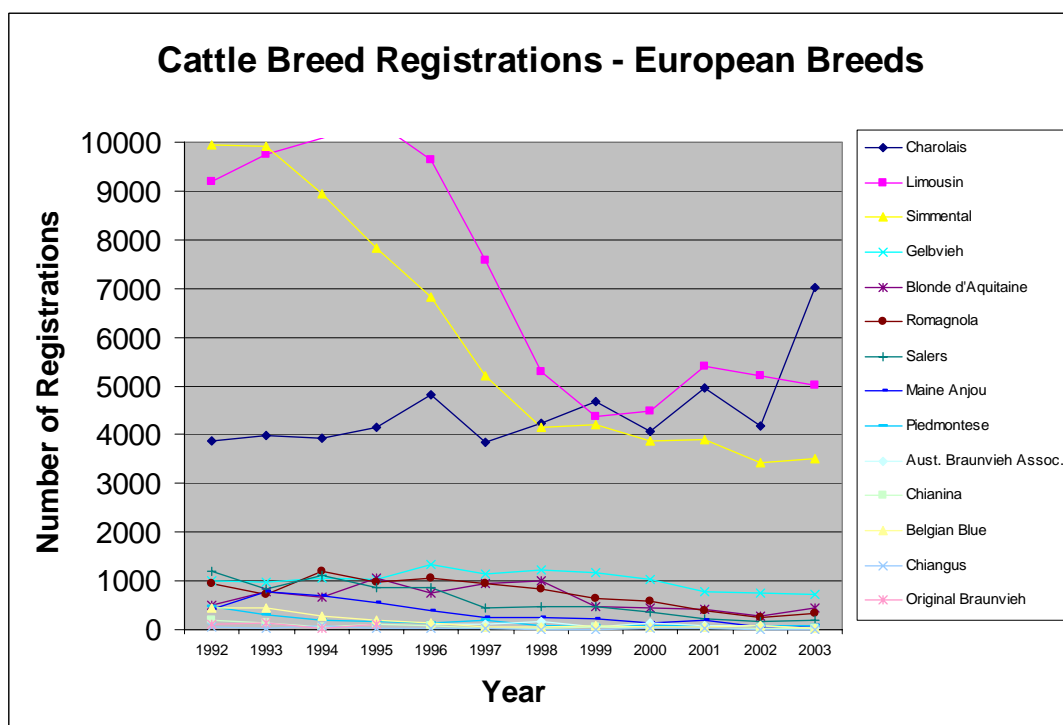
(SOURCE: Australian Registered Cattle Breeders Association)



**BEEF CATTLE REGISTRATIONS – TROPICAL BREEDS**  
(SOURCE: Australian Registered Cattle Breeders Association)



**BEEF CATTLE REGISTRATIONS – EUROPEAN BREEDS**  
(SOURCE: Australian Registered Cattle Breeders Association)



## Rare or Endangered Breeds of Cattle in Australia

The following list of cattle breeds in Australia has been developed by the RBTA and fit their criteria for being listed as rare. The listing is incomplete at this stage.

Status	Breed
<p><b>CRITICAL</b></p> <p>&lt; 25 annual female registrations</p>	<ul style="list-style-type: none"> <li>• White Park</li> <li>• British White</li> <li>• <u><i>Australian Milking Zebu</i></u></li> <li>• Sahiwal</li> </ul>
<p><b>ENDANGERED</b></p> <p>&lt;75 annual female registrations</p>	<ul style="list-style-type: none"> <li>• Traditional Hereford</li> <li>• Traditional Angus</li> <li>• Traditional Dairy Shorthorn</li> </ul>
<p><b>VULNERABLE</b></p> <p>&lt; 250 annual female registrations</p>	<ul style="list-style-type: none"> <li>• English Longhorn</li> <li>• <u><i>Australian Friesian Sahiwal (AFS)</i></u></li> </ul>
<p><b>AT RISK</b></p> <p>&lt;750 annual female registrations</p>	<ul style="list-style-type: none"> <li>• Devon (548 reg in 2003)</li> <li>• Galloway (313 reg in 2003)</li> <li>• Beef Shorthorn (255 reg in 2003)</li> <li>• <u><i>Belmont Red (580 reg in 2003)</i></u></li> <li>• <u><i>Belmont Adapteur</i></u></li> </ul>

## Dairy Cattle

The Australian dairy industry is the third most important rural industry valued at \$2.8 billion at farm gate in 2002-03. Although Australia produces only 2% of the world's milk, it ranks third in terms of dairy trade, accounting for 17% of all dairy product exports. More than half of the milk produced on Australian dairy farms is exported to more than 100 countries around the world.

The Australian dairy industry is predominantly pasture-based with approximately 80% of feed requirements coming from grazing. Feedlot dairying remains unusual in Australia, although the use of supplementary feed, with hay, silage and grains is becoming increasingly widespread.

The industry has undergone dramatic change over the past twenty years with average herd sizes increasing from 85 cows in 1980 to an estimated 195 cows in 2002/03. Australian dairy farmers have been operating in a completely deregulated industry environment since 2000. Approximately 70% of Australian dairy farms practice herd recording and genetic evaluation is conducted by the Australian Dairy Herd Improvement Service (ADHIS). Improvements in herd genetics as well as advances in pasture management and supplementary feeding regimes have seen average annual yields per cow increase from 2,850 litres to over 4,800 litres over the past two decades.

### Breeds of Dairy Cattle in Australia

Relative numbers of dairy breeds have been assessed using the ADHIS industry statistics. These statistics are from the 70% of dairy herds which participate in herd recording schemes and are indicative of the likely breed breakdowns across the broader industry. If we apply the percentages for all dairy breeds recorded to the total dairy population, the approximate breed numbers would be as shown in the table below:

#### ESTIMATED DAIRY BREED NUMBERS IN AUSTRALIA

Breed	Average Number of Cows in ADHIS #	% of total	Estimate of Cow Numbers 2003
Holstein	629183	70%	1,456,878
Jersey	88324	10%	204,550
Unknown	118243	13%	274,251
Holstein/Jersey cross	37588	4%	87,085
Illawarra	10702	1%	24,671
Ayrshire	6851	1%	15,792
Australian Red Breed	5671	1%	13,167
Guernsey	3873	0%	8,929
Brown Swiss	2869	0%	6,677
Dairy Shorthorn	601	0%	1,384
Simmental	336	0%	777
Australian Friesian			
Sahiwal	141	0%	325
Commercial dairy	101	0%	227
Australian Milking Zebu	74	0%	170
Red Poll	35	0%	79
Meuse-Rhine-Issel	17	0%	38
Total	904607		2,095,000

# These cow numbers are an average of three years data from 2000-2002.

Of the 14 breeds known to exist on dairy farms in Australia, Holstein-Friesian cattle are the predominant breed accounting for approximately 70% of all dairy cattle. Jerseys make up 10% of the national dairy herd, 13% are of unknown breeding, and 4% are Holstein/Jersey cross cattle.

The Australian Friesian Sahiwal (AFS) was developed by the Queensland government in the 1960s. In 1994 the QDPI sold all AFS livestock, semen and embryos and handed them over to industry for continued commercial development. The breed continues to be exported to a range of tropical countries including Mexico, Brunei, Philippines, Nicaragua, Thailand, India, Bangladesh, Sri Lanka, Malaysia, El Salvador, and Panama. Mexico has the largest breeding population with an estimated 1,000 purebred animals and 7,000 derivatives in the process of grading-up to pure bred.

The Australian Milking Zebu, which was developed in Australia in the 1950s by CSIRO, is now in rapid decline. The ADHIS statistics show only 63 AMZ animals were herd tested in Australia in 2002/03. The Australian Milking Zebu Breed Society has become inactive and animals are becoming difficult to locate. With a predominantly temperate-climate dairy industry in Australia and the increasing pressure on Australian dairy farmers to become more efficient producers, there is a declining role for the AMZ in Australia. 120 embryos and semen are currently held by the same seed-stock genetics business that holds most of the AFS.



# BREEDS OF CATTLE IN AUSTRALIA

No.	Breed	Developed by &/or country of origin	Imported to Australia	Parent breeds	Distribution in Australia	Breed Society in Australia
<u>1</u>	<u>Adapteur (Belmont Adapteur)</u>	<u>CSIRO Belmont Research Station</u>	<u>1950's</u>	<u>Hereford X Shorthorn</u>	<u>Central Queensland</u>	<u>Adapteur Association of Australia "Boxvale", Builyan, Qld. 4680</u> <u>ph (07) 4974 1163 fax (07) 4974 1343</u>
2	Africander (Afrikaner)	South Africa	1950's		Queensland	
3	Angus (Aberdeen Angus)	Scotland	1820's		All over, but mainly in southern temperate zones	The Angus Society of Australia Locked Bag 11, Armidale, NSW. 2350 Ph (02) 6772 3011 Fax (02) 6772 3095 www.angusaustralia.com.au
<u>4</u>	<u>Australian Friesian Sahiwal</u>	<u>ODPI, Australia</u>	<u>1960's</u>	<u>Holstein Friesian X Sahiwal</u>	<u>Tropical areas of NT, northern WA and northern Qld.</u>	<u>AFS Cattle breeders Association of Australia Inc. 157 Burbong St, Chapel Hill, Q. 4069</u> <u>(07) 3378 4258</u> <u>www.afstropicaldairybreed.org</u>
<u>5</u>	<u>Australian Milking Zebu (AMZ)</u>	<u>CSIRO, Australia</u>	<u>1950's</u>	<u>Sahiwal &amp; Sindhi X HF&amp;Jersey&amp;Guernsey &amp; Illawarra &amp; Ayrshire</u>	<u>Old &amp; NSW</u>	<u>The AMZ Breed Society (since 1970)</u> <u>c/o AFS Cattle Breeders Association of Aust.Inc. 157 Burbong St, Chapel Hill, Q. 4069</u> <u>(07) 3378 4258</u> <u>www.afstropicaldairybreed.org</u>
<u>6</u>	<u>Australian Red Dairy Breed (Aussie Red)</u>	<u>Sweden/Norway/ Denmark/Germany</u>	<u>1985</u>		<u>Vic, NSW, SA, WA, Qld, Tas</u>	<u>Australian Red Dairy Breed Inc 44 Ferguson Cres, Deakin, ACT.2600</u> <u>ph (02) 6273 4088</u> <u>www.austredbreed.une.edu.au</u>
7	Ayrshire	Scotland	1848		NSW, Vic, Qld, SA, Tas, WA.	Ayrshire Australia Ltd (1891) PO Box 189 Kiama, NSW 2533 Ph (02) 4232 3333 F (02) 4232 3350  Australian Ayrshire Breeders Ass. Inc (late 1970's) Roya Showgrounds, Epsom Rd. Ascot Vale, Vic 3032 Ph (03) 9281 7556 F (03) 9376 2973 <a href="http://www.ksrcl.com.au">www.ksrcl.com.au</a>
8	Bazadaise	France (south of Bordeaux)	1991		Tas, Vic, NSW, Qld NT, SA	Bazadaise Breeders of Aust. Assoc. Inc. (1994) PO Box 54 Grantville, Vic 3984. Ph (03) 5678 8366 F (03) 5678 8247 <a href="http://www.bazadaise.com.au">www.bazadaise.com.au</a>

No.	Breed	Developed by &/or country of origin	Imported to Australia	Parent breeds	Distribution in Australia	Breed Society in Australia
9	Beefmaker	NSW, Australia in 1972		75 % Hereford X 25% Simmental		
10	Beef Shorthorn	Northern England	1825		Vic, SA, Tas, NSW, southern Qld, WA ACT, NT	Beef Shorthorn Society of Australia (1920) Private Bag 2020 Box Hill, Vic 3128 Ph(03) 8800 3233 F(03) 9890 1379 <a href="http://www.beefshorthorn.org.au">www.beefshorthorn.org.au</a>
11	Belgian Blue	Ardenne Hills region of Belgium	1988		Vic (mainly)	The Australian Belgian Blue Cattle Society (1988) PO Box 575 Berwick, Vic 3806. Ph/fax (03) 5629 2560 <a href="http://www.allbreeds.info/australian_belgian_blue">www.allbreeds.info/australian_belgian_blue</a>
<b><u>12</u></b>	<b><u>Belmont Red</u></b>	<b><u>CSIRO Belmont, Australia</u></b>	<b><u>1954</u></b>	<b><u>50% Africander X</u></b> <b><u>25% Shorthorn X</u></b> <b><u>25% Hereford</u></b>	<b><u>Qld, NSW, WA, Vic</u></b>	<b><u>Belmont Red Assoc of Australia (1979)</u></b> <b><u>PO Box 990 Armidale NSW 2350</u></b> <b><u>Ph (02) 6772 7720 F (02) 6772 9599</u></b> <b><u><a href="http://www.belmontred.com.au">www.belmontred.com.au</a></u></b>
13	Belted Galloway	South west Scotland	1950's from NZ		SA, NSW, Vic, Tas, Qld, WA	Australian Belted Galloway Assoc. Inc. (1975) Kiama Stud Registration Centre Ltd PO Box 189 Kiama, NSW 2533 Ph (02) 4232 3333 F (02) 4232 3350 <a href="http://www.beltedgalloway.com.au">www.beltedgalloway.com.au</a>
14	Blonde d'Aquitaine (Blondes)	South west France	1972		All over Australia	The Blonde d'Aquitaine Society of Australia and New Zealand ABRI, UNE. Armidale, NSW. 2351 Ph (02) 6773 2393 F (02) 6772 1943 <a href="http://blondes.une.edu.au">http://blondes.une.edu.au</a>
15	Bonsmara	South Africa	1998	3/8 Shorthorn-Hereford 5/8 Africander	Qld, NSW	Bonsmara Cattle Breeders Society of Australia Inc. (2000) PO Box 990 Armidale, NSW 2350 Ph (02) 6772 7720 F (02) 6772 9599
16	Boran	Southern Ethiopia, Africa	1990		Qld, NSW	Boran Association of Australia Inc. PO Box 18 Jambin, Qld, 4702 Ph (07) 4996 5245 F (07) 4996 5362
<b><u>17</u></b>	<b><u>Braford</u></b>	<b><u>Old, Australia</u></b>	<b><u>1940's</u></b>	<b><u>Brahman X Hereford</u></b>	<b><u>Old, NSW mainly</u></b>	<b><u>Australian Braford Society Inc (1962)</u></b> <b><u>PO Box 749 Rockhampton, Qld.4700</u></b> <b><u>Ph (07) 4927 5196 F (07) 4927 5708</u></b>

						<a href="http://www.braford.org.au">www.braford.org.au</a>
No.	Breed	Developed by &/or country of origin	Imported to Australia	Parent breeds	Distribution in Australia	Breed Society in Australia
18	Brahman	USA	1933		Qld, northern NSW, WA, NT (Vic)	Australian Brahman Breeders Association PO Box 796 Rockhampton, Qld 4700 Ph (07) 4927 7799 <a href="http://www.brahman.com.au">www.brahman.com.au</a>
19	Brangus	USA	1950's	Brahman X Angus	Mainly in Qld, NT & northern NSW	The Australian Brangus Cattle Assoc. Inc. (1961) ABRI, UNE, Armidale, NSW. 2351 Ph (02) 6773 3373 F (02) 6772 5376 <a href="http://brangus.une.edu.au">http://brangus.une.edu.au</a>
20	Braunvieh	Germany, Austria & Switzerland	1972-1990		Qld, Vic, NSW, Tas, SA & WA	Australian Braunvieh Assoc. Inc (1974 -1994) PO Box 45 Apsley, Vic 3319 Ph/Fax (03) 5586 1218 <a href="http://www.braunviehcentre.com">www.braunviehcentre.com</a> The Original Braunvieh Beef Breeders of Aust. PO Box 409 Cockatoo, Vic 3781 Ph (03) 5968 1533 F (03) 8537 5059
21	British White	England	1958		NSW, Qld, WA, SA, Vic	The British White Cattle Society of Aust. Ltd (1983) MS 422 Clifton, Qld, 4361 Ph/fax (07) 4695 8561
22	Brown Swiss	Switzerland	1974		Qld, Vic, NSW, Tas, WA	Brown Swiss Cattle Breeders of Australia (1974) 20 Britain St, Leura, NSW. 2780 ph (02) 4784 1266 <a href="http://www.brownswiss.com.au">www.brownswiss.com.au</a>
23	Charbray	Texas, USA	After 1969	Charolais bull X Brahman cows	Qld, NSW, Vic, WA	The Charbray Society of Australia (1977) PO Box 5245 Central Qld MC, Qld, 4702 Ph (007) 4936 3535 F (07) 4936 3765 <a href="http://www.charbray.org">www.charbray.org</a>
24	Charolais	Central France	1969		NSW, Qld, Vic, SA, NT, WA, Tas	The Charolais Society of Australia Ltd PO Box 772 Armidale, NSW. 2350 Ph (02) 6771 1666 F (02) 6771 1561 <a href="http://www.charolais.com.au">www.charolais.com.au</a>
25	Chiangus	California USA	1975	Chianina X Angus	Vic, NSW, Qld, WA, SA,	The Chiangus Herd Book (1986) Chianina Society of Australia ABRI, UNE, Armidale, NSW. 2351 Ph (02) 6773 2242 F (02) 6772 5376

26	Chianina	Asia/Africa to Italy	1974		Qld, NSW, Vic, WA	Chianina Society of Australia (1973) ABRI, UNE, Armidale, NSW. 2351 Ph (02) 6773 2242 F (02) 6772 5376
<b>No.</b>	<b>Breed</b>	<b>Developed by &amp;/or country of origin</b>	<b>Imported to Australia</b>	<b>Parent breeds</b>	<b>Distribution in Australia</b>	<b>Breed Society in Australia</b>
27	Dairy Shorthorn	16th century Britain	Pre 1930		Tas, NSW, SA, WA, Vic	Dairy Shorthorn Assoc of Australia (1930) Royal Showgrounds, Epsom Rd Ascot Vale Vic 3032 Ph (03) 9281 7440 F (03) 9376 2973 <a href="http://www.geocities.com/dairyshorthorn/">www.geocities.com/dairyshorthorn/</a>
28	Devon	South west England	Early 1800's		All states	Devon Cattle Breeders Society of Aust. (1935) PO Box 72 Gloucester, NSW. 2422 Ph/fax (02) 4994 7189 <a href="http://www.devoncattle.com">www.devoncattle.com</a>
29	Dexter	Ireland	Pre 1940's		All states and ACT	Dexter Cattle Australia Inc (1987) ABRI UNE, Armidale, NSW 2351 Ph (02) 6773 3471 F (02) 6772 5376 <a href="http://dexter.une.edu.au">http://dexter.une.edu.au</a>
<b><u>30</u></b>	<b><u>Droughtmaster</u></b>	<b><u>North Queensland, Australia</u></b>	<b><u>1930's</u></b>	<b><u>Zebu bulls X Shorthorn, Hereford &amp; Shorthorn-Devon cross cows + Brahman cattle after 1930's</u></b>	<b><u>Nt, Qld, northern NSW &amp; WA</u></b>	<b><u>Droughtmaster Breeders Society</u></b> <b><u>PO Box 978 Kenmore, Qld. 4069</u></b> <b><u>Ph (07) 3378 3040 F (07) 3878 1569</u></b> <b><u><a href="http://www.droughtmaster.com.au">www.droughtmaster.com.au</a></u></b>
31	English Longhorn					
32	Galloway	South west Scotland	Pre 1858		NSW, Qld, SA, Tas, Vic, WA, ACT	Australian Galloway Association (1951) PO Box 531 Wodonga, Vic. 3689 Ph (02) 6027 3361 F (02) 6027 3454 <a href="http://www.galloway.asn.au">www.galloway.asn.au</a>
33	Gelbvieh	Bavaria	1976-1979		Qld, Vic, Tas, NSW, SA, WA, ACT	Australian Gelbvieh Assoc. inc. ABRI, UNE, Armidale, NSW. 2351 Ph (02) 6773 3373 F (02) 6772 1943 <a href="http://www.gelbvieh.asn.au">www.gelbvieh.asn.au</a>
34	Greyman			Murray Grey X Brahman		<b><u>The Murray Grey Beef Cattle Society (1962)</u></b> <b><u>PO Box 250 Armidale, NSW, 2350</u></b> <b><u>Ph (02) 6771 5151 F (02) 6771 5144</u></b> <b><u><a href="http://www.murraygrey.com.au">www.murraygrey.com.au</a></u></b>
35	Guernsey	Brittany/Guernsey	1898		SA, Vic, Qld, NSW, Tas, WA	Guernsey Cattle Society of Aust. Inc. (1911) Kiama Stus Registration Centre Ltd

						PO Box 189, Kiama, NSW. 2533 Ph (02) 4232 3333 F (02) 4232 3350 <a href="http://www.ksrcl.com.au">www.ksrcl.com.au</a>
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No.	Breed	Developed by &/or country of origin	Imported to Australia	Parent breeds	Distribution in Australia	Breed Society in Australia
36	Hereford	Herefordshire, England	1826		Qld, NSW, SA, Vic, Tas, WA	Australian Hereford Society Ltd (1890) PO Box 1014 Spring Hill, Qld. 4004 Ph (07) 3236 2166 F (07) 3236 2177 <a href="http://www.hereford.com.au">www.hereford.com.au</a>
37	Highland Cattle	Highlands and west coastal islands of Scotland	Mid 1800's reintroduced in 1950's		Vic, Tas, SA, NSW, Qld, WA	Australian Highland Cattle Society Inc (1988) Royal Showgrounds, Epsom Rd Ascot Vale Vic 3032 Ph 903) 9281 7444 F (03) 9376 2973 <a href="http://www.highlandcattle.org.au">www.highlandcattle.org.au</a>
36	Holstein	Western Europe	1850's		All dairy areas across Australia	Australian Holstein Friesian Association Inc (1914) Private Bag 14, 504 Racecourse Rd. Flemington, Vic 3031 Ph (03) 9376 1811 F (03) 9372 1394 <a href="http://holsteinaust.une.edu.au">http://holsteinaust.une.edu.au</a>
<b><u>38</u></b>	<b><u>Illawarra</u></b>	<b><u>Australia, 80km south of Sydney</u></b>	<b><u>Pre 1930's</u></b>	<b><u>Jersey, Guernsey, Dexter, Holstein-Friesian, Shorthorn, Ayrshire</u></b>	<b><u>Old, NSW, SA, Vic</u></b>	<b><u>Illawarra Cattle Society of Australia Ltd. (1930)</u></b> <b><u>PO Box 189 Kiama, NSW. 2533</u></b> <b><u>Ph 902) 4232 3333 F (02) 4232 3350</u></b> <b><u><a href="http://www.ksrcl.com.au/illawarra">www.ksrcl.com.au/illawarra</a></u></b>
39	Kimberly Shorthorn	Australian				
40	Jersey	English Channel Island of Jersey	1850's		All states and territories	Australian Jersey Breeders Society (1899) PO Box 292 Ascot Vale, Vic 3032 Ph (03) 9370 9105 <a href="http://www.jersey.com.au">www.jersey.com.au</a>
41	Limousin	Central France	1973		Qld, NSW, Vic, Tas, SA, WA	Australian Limousin Breeders Society Ltd PO Box 262 Armidale, NSW. 2350 Ph (02) 6771 1648 F (02) 6772 9364 <a href="http://www.limousin.com.au">www.limousin.com.au</a>
42	Lincoln Red	Lincolnshire, England	Early 1900's and again in 1951		South west WA, Hunter region and Liverpool ranges of NSW, also Qld, Vic, Tas & Norfolk	The Lincoln Red Society (Aust) Ltd (1971) PO Box 601 Armidale, NSW 2350 Ph (02) 6771 5219 F (02) 6772 2244

					Island.	
<b><u>43</u></b>	<b><u>Lowline</u></b>	<b><u>NSW Dept Agriculture, Trangie Research Centre Australia</u></b>	<b><u>1974</u></b>	<b><u>Angus</u></b>	<b><u>Tas, Vic, Qld, SA, WA, NSW, ACT</u></b>	<b><u>Australian Lowline Cattle Ass. Inc. (1992) ABRI, UNE, Armidale, NSW, 2351 Ph (02) 6773 2393 F (02) 6772 1943 <a href="http://lowline.une.edu.au">http://lowline.une.edu.au</a></u></b>
<b>No.</b>	<b>Breed</b>	<b>Developed by &amp;/or country of origin</b>	<b>Imported to Australia</b>	<b>Parent breeds</b>	<b>Distribution in Australia</b>	<b>Breed Society in Australia</b>
44	Luing	Isle of Luing, off west coast of Scotland	?	Beef Shorthorn X Highland	Highlands of SE Australia	
45	Maine Anjou	North west France	1973		Central NSW, Vic	Maine Anjou Society Ltd (1993) PO Box 505 Mt Martha, Vic 3934 Ph (03) 5976 3140 F (03) 5974 3120 <a href="http://www.allbreeds.info/maine_anjou">www.allbreeds.info/maine_anjou</a>
<b><u>46</u></b>	<b><u>Mandalong Specials</u></b>	<b><u>Erskine Park NSW, Australia</u></b>	<b><u>1970's</u></b>	<b><u>Brahman, Poll Shorthorn, Charolais, British White, Chianina</u></b>	<b><u>NSW, Qld, NT, Vic, SA</u></b>	<b><u>Mandalong Specials Cattle Ass. of Aust. Mandalong Park, Mamre Rd. Erskine Park NSW. 2759 Ph 902) 9670 4005 F (02) 9760 5375</u></b>
47	Meuse-Rhine-Issel (Dutch Red and White)	Holland				
48	Minature Hereford	South West Texas, USA	1997	Hereford	All Australian states & NZ	Aust. Minature Hereford Cattle Assoc. Inc (1997) PO Box 442 Echunga, SA. 5153 Ph/fax (08) 8388 9632 <a href="http://www.minatureherefords.com.au">www.minatureherefords.com.au</a>
<b><u>49</u></b>	<b><u>Murray Grey</u></b>	<b><u>Upper Murray Valley, NSW-Vic border Australia</u></b>	<b><u>1905</u></b>	<b><u>Angus X Shorthorn</u></b>	<b><u>NSW, Vic, Qld, Tas, SA, WA, ACT</u></b>	<b><u>The Murray Grey Beef Cattle Society (1962) PO Box 250 Armidale, NSW, 2350 Ph (02) 6771 5151 F (02) 6771 5144 <a href="http://www.murraygrey.com.au">www.murraygrey.com.au</a></u></b>
50	Piedmontese	Italy	1988-89	Aurochs X Zebu	NSW, ACT, Vic, Qld, SA	Australian Piedmontese Cattle Association ABRI, UNE, Armidale, NSW. 2351 Ph (02) 6773 3342 F (02) 6772 1943 <a href="http://www.piedmontesecattle.com.au">www.piedmontesecattle.com.au</a>
51	Pinzgauer	Austria	1990		Qld, NSW, Vic, Tas	Australian Pinzgauer Breeders Assoc. Ltd. (1990) PO Box 189 Kiama, NSW. 2533 Ph (02) 4232 3333 F (02) 4232 3350 <a href="http://www.ksrcl.com.au">www.ksrcl.com.au</a>
52	Poll Hereford	USA	1920	Hereford	Qld, NSW, SA, WA, Tas, ACT,	The Australian Poll Hereford Society Ltd (1933) Locked Bag 7 Armidale, NSW. 2350

					southern NT	Ph (02) 6772 1399 F (02) 6772 1615 <a href="http://www.pollhereford.com.au">www.pollhereford.com.au</a>
53	Red Angus	Introduced to Scotland by Vikings			All Aust states and territories	Red Angus Society of Australia. Inc. (1970) ABRI, UNE, Armidale, NSW. 2351 Ph (02) 6773 3144 F (02) 6772 1943 <a href="http://www.redangus.org.au">www.redangus.org.au</a>

No.	Breed	Developed by &/or country of origin	Imported to Australia	Parent breeds	Distribution in Australia	Breed Society in Australia
54	Red Poll	Suffolk England	1850		WA, SA, Qld, NSW, Vic	Australian Red Poll Society Inc (1918) ABRI, UNE, Armidale, NSW 2351 Ph (02) 6773 3144 F (02) 6772 1943 <a href="http://redpoll.une.edu.au">http://redpoll.une.edu.au</a> The Red Poll Cattle Breeders Assoc of Aust. (1978) 840 Ardmona Rd. Mooroopna, Vic. 3629 ph (03) 5829 0122
55	Romagnola	Italian peninsula	1976		Qld, NSW, WA, SA, Vic Tas	Romagnola Breeders Society Ltd (1992) PO Box 860 Toowoomba, Qld. 4350 Ph (07) 4638 0666 F (07) 4638 0667 <a href="http://www.romagnola.com.au">www.romagnola.com.au</a>
56	Sahiwal	Punjab, Pakistan	1950's		Qld, NT, northern NSW, northern WA	The Australian Sahiwal Society (1969) 'The Grange', Willowvale, Qld. 4209 Ph (07) 5546 6268
57	Salers	France	1985		Qld, NSW, WA, Tas, Vic, SA	Australian Salers Assoc. Inc. (1985) ABRI, UNE, Armidale, NSW. 2351 Ph (02) 6773 2393 F (02) 6772 1943 <a href="http://salers.une.edu.au">http://salers.une.edu.au</a>
58	Santa Getrudis	Texas USA	1952	Brahman X Shorthorn	All states and territories of Aust.	Santa Getrudis Breeders (Aust) Assoc. (1954) Santa Getrudis House, 103 Copperfield St PO Box 57, Geebung, Qld. 4034 Ph (07) 3216 2708 F (07) 3216 2509 <a href="http://www.santagetrudis.com.au">www.santagetrudis.com.au</a>
59	Senepol	St Croix, Caribbean	2000	N'Dama X Red Poll	Qld, NT, NSW, WA	Australian Senepol Cattle Breeders Assoc. Inc. (2000) 'Wirrabilla', Limestone Ridges, Peak Crossing, Qld. 4306 Ph (07) 5467 2136 F (07) 5467 2034

						<a href="http://www.senepol.com.au">www.senepol.com.au</a>
60	Shorthorn	British breed	1825		All states and territories of Aust.	The Shorthorn Society of Australia Ltd. (1935) PO Box 61 Armidale, NSW. 2350 Ph (02) 6772 9622 F (02) 6772 2244 <a href="http://www.shorthorn.com.au">www.shorthorn.com.au</a>
61	Simbrah		1960's	Simmental X Brahman		The Australian Simmental Breeders Assoc. Ltd. PO Box 323 Concord West NSW. 2138 Ph (02) 9764 6111 F (02) 9764 6100 <a href="http://www.simmental.com.au">www.simmental.com.au</a>
<b>No.</b>	<b>Breed</b>	<b>Developed by &amp;/or country of origin</b>	<b>Imported to Australia</b>	<b>Parent breeds</b>	<b>Distribution in Australia</b>	<b>Breed Society in Australia</b>
62	Simmental	Simme Valley, Switzerland	1971		Throughout Australia	The Australian Simmental Breeders Assoc. Ltd. PO Box 323 Concord West NSW. 2138 Ph (02) 9764 6111 F (02) 9764 6100 <a href="http://www.simmental.com.au">www.simmental.com.au</a>
63	Sindhi	Sind province of Pakistan	1954 as gift to Aust Govt from Pakistan		Limited distribution all in tropical areas	
64	South Devon	South Devon, England	Early 1900's		Qld, NSW, Tas, Vic, SA, WA	South Devon Cattle Society of Aust. Inc. ABRI, UNE, Armidale, NSW 2351 Ph (02) 6773 3144 F (02) 6772 1943 <a href="http://southdevon.une.edu.au">http://southdevon.une.edu.au</a>
65	<i>Square Meaters</i>	<i>NSW, Australia</i>	<i>1996</i>	<i>Murray Grey</i>	<i>Qld, NSW, Tas, WA, Vic, ACT</i>	<i>Square Meaters Cattle Association (1996)</i> <i>PO Box 371 St Mary's NSW. 1790</i> <i>Ph (02) 9834 4322 F (02) 9834 4311</i> <a href="http://www.squaremeaters.com.au">www.squaremeaters.com.au</a>
66	Sussex					
67	Tuli	Zimbabwe	1990		Qld NSW, WA, SA	Tuli Association of Aust. Po Box 18 Jambin, Qld. 4702 Ph (02) 6782 1007 or (07) 4996 5245
68	Texas Longhorns		1986			
69	Wagyu	Japan	1988		All states of Aust and ACT (not NT)	The Australian Wagyu Breeders Assoc. Ltd (1989) ABRI, UNE, Armidale, NSW. 2351 Ph (02) 6773 3138 F (02) 6772 1943 <a href="http://wagyu.une.edu.au">http://wagyu.une.edu.au</a> Blackmore Genetics 2335 Mickleham Rd Mickleham. Vic 3064.

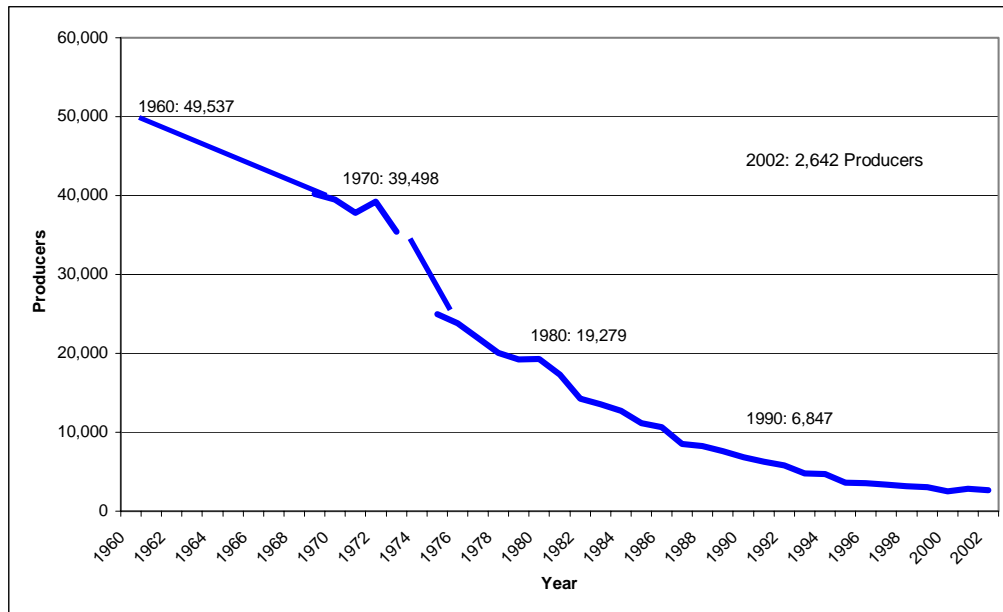


70	Welsh Black	Hill country of Wales	1980's		Vic, NSW, SA, Tas, King Island, Qld,	Australian Welsh Black Cattle Society inc. (1994) Royal Melbourne Showgrounds, Epsom Rd, Ascot Vale Vic 3032 Ph (03) 9281 7444 F (03) 9376 2973
71	White Park	UK	1987		ACT., Serpentine, WA.	Ph (02) 6230 3372 <a href="mailto:aranmohr@austarmetro.com.au">aranmohr@austarmetro.com.au</a>
72	Zebu	India, Asia, Africa	1920's		Northern Australia in limited numbers	Australian Zebu Association Lot 6 Widgee Creek Hill View via Beaudesert Qld. 4285 Ph (07) 5544 8173

## Pigs

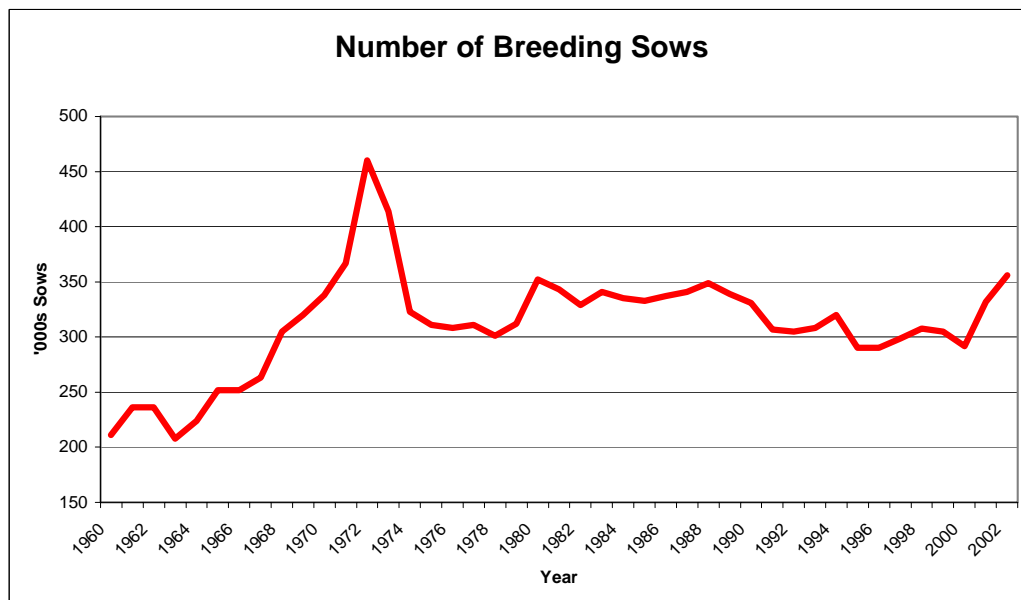
### NUMBER OF PIG BREEDERS IN AUSTRALIA SINCE 1960

Source: Australian Bureau of Statistics and Australian Pork Limited.



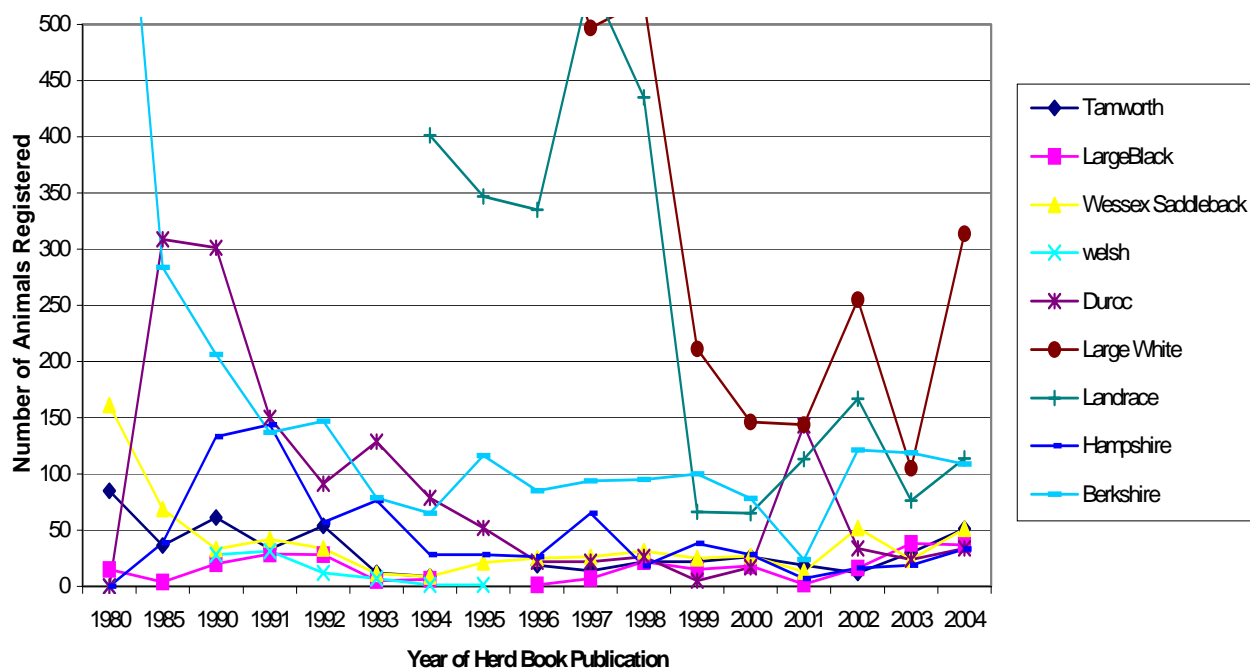
### TOTAL NUMBER OF BREEDING SOWS IN AUSTRALIA

Source: Australian Bureau of Statistics and Australian Pork Limited.



## TOTAL ANNUAL (MALE AND FEMALE) PIG REGISTRATIONS IN AUSTRALIA

Rare Breed Pig Registrations in Australia (Source: APBA Herd Book)



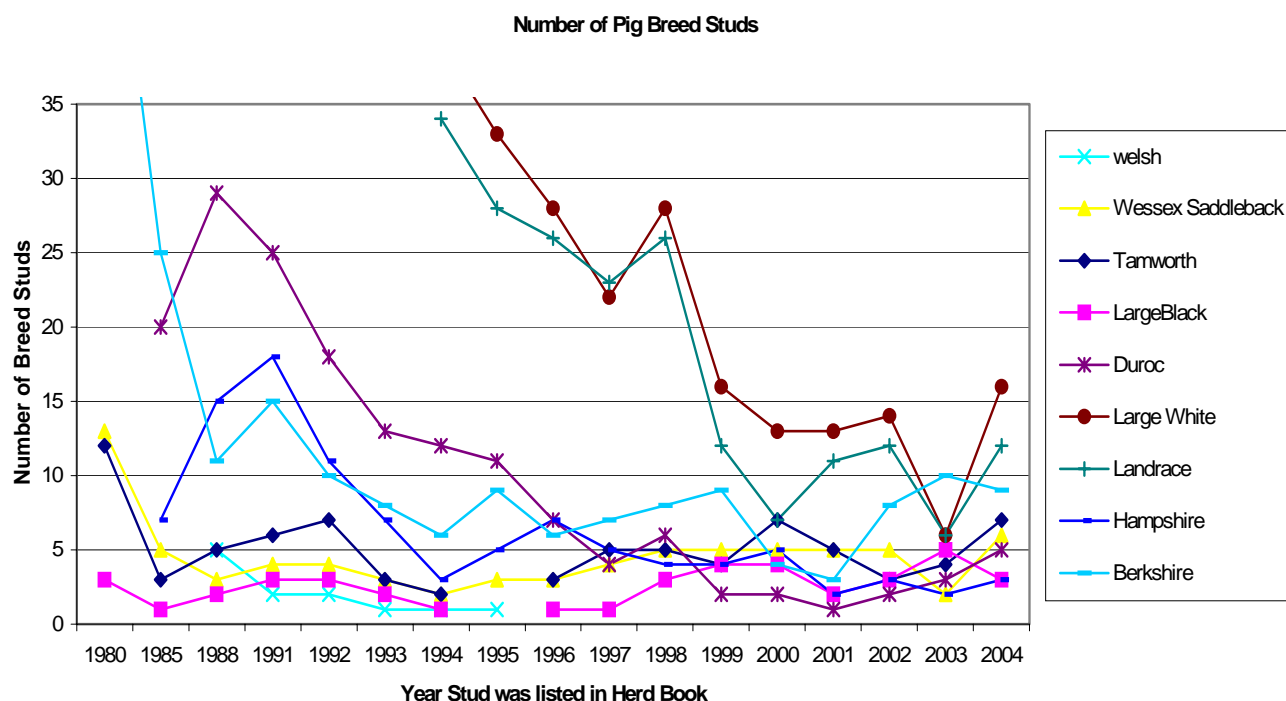
Large White, Landrace and Duroc pigs were included in 2000-01.

## ESTIMATE OF GLOBAL NUMBERS OF REGISTERED PUREBRED PIGS

(Source RBTA)

Breed	Estimate of UK Population	Estimate of Global population (outside of UK)	Estimate of Australian population
Berkshire	circa 300 sows	circa 12,000 sows (but almost all in USA and population is suspect – ref haplotype tests)	Circa 200 sows
British Saddleback	Circa 350 sows	Circa 100 sows	Circa Nil sows
Large Black	Circa 300 sows	Circa 100 sows	Circa 70 sows
Tamworth	Circa 200 sows	Circa 1000 sows	Circa 70 sows
British Lop	Circa 200 sows	Circa nil sows	Circa nil sows
Gloucester Old Spots	Circa 500 sows	Circa 50 sows	Circa nil sows
Middle White	Circa 300 sows	Circa negligible	Circa nil sows
Wessex Saddleback	Circa 2 sows (imported to UK from Australia)	Circa 70 sows- all in Australia	Circa 70 sows

## NUMBER OF REGISTERED PIG STUDS IN AUSTRALIA



## NUMBER OF ANIMALS ENTERING THE AUSTRALIAN PIG BREEDERS ASSOCIATION NATIONAL HERD BOOK THROUGH THE APPENDIX SYSTEM

BREED	2002 expresses as actual number and % of total entries	2003 expresses as actual number and % of total entries	2004 expresses as actual number and % of total entries
Large Black	3 (19%)	0	0
Hampshire	0	3	2 (6%)
Large White	5 (2%)	1 (1%)	39 (12%)
Landrace	1 (<1%)	4 (5%)	32 (28%)
Berkshire	8 (6%)	0	5 (5%)
Wessex Saddleback	1 (2%)	0	0
Tamworth	0	0	0
Duroc	0	1 (4%)	17 (50%)

## TOTAL NUMBER OF STUDS REGISTERING PIGS UNDER THE APPENDIX SYSTEM

BREED	2002 expresses as actual number and % of total entries	2003 expresses as actual number and % of total entries	2004 expresses as actual number and % of total entries
Large Black	1 (33%)	0	0
Hampshire	0	1 (50%)	2 (67%)
Large White	3 (14%)	1 (16%)	11 (69%)
Landrace	1 (8%)	1 (16%)	7 (58%)
Berkshire	1 (12%)	0	2 (22%)
Wessex Saddleback	1 (20%)	0	0
Tamworth	0	0	0
Duroc	0	1 (33%)	5 (100%)

# LINES WITHIN THE RARER PIG BREEDS AUSTRALIA IN 2004

(An indicator of levels of inbreeding)

	WESSEX SADDLEBACK	LARGE BLACK	TAMWORTH	BERKSHIRE (incomplete)
MALE LINES	1. Pilot 2. Prince 3. Dominator 4. Satellite 5. Charlsun (Sir Charles)	1. Smithy 2. Black Jack (Jock)	1. Ajax 2. Regent 3. Jasper 4. Ranger 5. Roger 6. Atomic	1. Tom 2. Nobleman 3. Monty 4. Marshall 5. Cobber 6. Orlando
FEMALE LINES	1. Doreen 2. Sunset 3. Lucy 4. Lass 5. Beatrice 6. Adorabelle 7. Mary 8. May	1. Princess )all 2. Black Lady)one 3. Gypsy )line 4. Tess 5. Lady 6. Busy Maid 7. Black Ann 8. Lady Christina	1. Golden Martha 2. Martha 3. Jewell 4. Anne 5. Bertha 6. Rita 7. Lisa 8. Ruby 9. Elaine 10. Gleam	1. Star 2. Roseland 3. Joy 4. Lillie 5. Orange Blossom 6. Rose 7. Rainbow Magic

## RARITY STATUS OF PIG BREEDS IN AUSTRALIA IN 2004

(Source RBTA)

Status	Breed
<b>CRITICAL</b> <30 annual registrations of females	<ul style="list-style-type: none"> <li>Wessex Saddleback</li> <li>Large Black</li> </ul>
<b>ENDANGERED</b> <115 annual registrations of females	<ul style="list-style-type: none"> <li>Tamworth</li> </ul>
<b>VULNERABLE</b> <350 annual registrations of females	<ul style="list-style-type: none"> <li>Berkshire</li> </ul>
<b>AT RISK</b> <1165 annual registrations of females	

## Sheep

Sheep in Australia support two major industries. The wool industry, which is now Australia's second most important rural industry; and the sheep meat industry, which was valued at around \$1.5billion in 2000. Milking sheep have been introduced to Australia in recent years and constitute a small but growing industry.

95% of Australia's national sheep flock are either purebred Merino sheep (85.1%) used for wool production or first cross sheep (10.4%) used for producing prime lambs. The remaining 4.5% of sheep in Australia represent more than 40 distinctly different breeds.

### Sheep Breeds Known to Exist in Australia

(Source: RBTA)

It can be concluded from the numbers above, that there are 5.28 million purebred sheep (other than Merino) represented in Australia. Many of these breeds have been developed and "fixed" genetically by breeders in Australia and New Zealand and are descended from or still closely related to Merino sheep. Examples of these breeds include the following:

#### BREEDS OF SHEEP DERIVED FROM MERINO SHEEP

Breed	%Merino	Developed in	Parent Breeds
Border-Merino	50%		Border Leicester ram over Merino ewe
Corriedale	50%	Australia & New Zealand.	Lincoln X Merino
Polwarth	75%	Western district of Victoria, Australia	Merino crossed with Lincoln X Merino 1 <sup>st</sup> Cross
Cormo	75%	Tasmania, Australia.	Corriedale ram over Saxon Merino ewes
Comeback	75%	Tasmania and Victoria	Merino X Corriedale and Polwarth
Zenith		Victorian sheep/wheat belt, Australia	Lincoln & Merino
Bond	50%	Australia	Imported Lincoln rams X Peppin Strain Merino.

The table below is a summary prepared by the Rare Breeds Trust of Australia of all sheep breeds known to exist in Australia. The list may be incomplete and should be used as a guide only. It requires further research and development.

#### SHEEP BREEDS KNOWN TO EXIST IN AUSTRALIA

<i>No</i>	<i>Breed</i>	<i>Developed by &amp;/or country of origin</i>	<i>Imported to Australia</i>	<i>Parent Breeds</i>	<i>Breed Society in Australia</i>	<i>Distribution in Australia and Description</i>
	<b><i>Wool Sheep Breeds</i></b>					
1a	Merino – Peppin Strain (Medium wool)				Australian Association of Stud Merino Breeders Ltd Level 2, RAS Admin Building 1 Showgrounds Rd, Homebush Bay, NSW 2127 Ph (02) 9763 2744 Fax (02) 9763 1878 <a href="http://www.merinos.com.au">www.merinos.com.au</a>	As much as 70% of all Merinos in Australia are said to be directly descended from the Peppin-developed sheep. This breed has a large frame and long legs, making it an efficient forager in dry inland areas. Produce around 10Kg wool each year which is high in wool grease, giving the wool a creamy colour
1b	Merino – Saxon Strain (Superfine & fine wool)				As above	Higher rainfall sheep. Smallest of all Merino strains cutting only 4-5kg wool each year. The wool is soft to handle, extremely bright, white in colour and very fine.
1c	Merino – South Australian Strain (Strong wool)				As above	The largest of all of the Merino strains in Australia. It has longer legs and a taller, heavier body than the Peppin and tends to have fewer skin wrinkles than the other strains. It also has the coarsest wool fibres of any of the strains and has a higher proportion of natural grease.
1d	Merino – Camden Strain		1797 and 1804		Victoria Stud Merino Sheepbreeders Association Inc PO Box 326 Horsham, Vic 3402 Ph (03)53811866 Fax(03) 5382 6022 <a href="http://www.merinovictoria.com">www.merinovictoria.com</a>	A closed flock descended directly from Captain John Macarthur's "Camden Park" flock which was founded on Spanish bloodlines through Merinos he imported to Australia in 1797 and 1804.
1e	Merino – Spanish Strain				As above	Relatively few in numbers compared with the other strains.

<i>No</i>	<i>Breed</i>	<i>Developed by &amp;/or country of origin</i>	<i>Imported to Australia</i>	<i>Parent Breeds</i>	<i>Breed Society in Australia</i>	<i>Distribution in Australia and Description</i>
	<b><i>Wool Sheep Breeds</i></b>					
1f	Poll Merino				Australian Association of Stud Merino Breeders Ltd Level 2, RAS Admin Building 1 Showgrounds Rd, Homebush Bay, NSW 2127 Ph (02) 9763 2744 Fax (02) 9763 1878 <a href="http://www.merinos.com.au">www.merinos.com.au</a>	The development of the Poll Merino is relatively new. Recessive poll genes are believed to have existed in the breed for many years and infusions of hornless sheep during the development of the Merino breed in Australia also left some poll genes within normal Merino flocks. Poll rams have been selected and mated to Merino ewes and selection continued for the quality of polledness. The result is a pure Merino without horns. Because the selection and development of the Poll Merino has been largely on a 'within flock' basis, this Merino type is scattered throughout the Merino areas of Australia, and is represented within all categories of Merino mentioned previously, i.e. fine, medium and strong wools.
1g	Booroola Merino	CSIRO, Southern Tablelands of NSW, Australia			As above	The Booroola Merinos differ from the normal Merino in two important ways. First, their fertility is as high as any breed in the world. The number of lambs born per ewe lambing averages 2.4 with a range from one to six. In crosses with other Merinos this difference is naturally reduced but half-Booroola ewes on average wean about 20 percent more lambs than comparable Merinos under the same conditions. Second, they have the ability to breed at most times of the year, thus extending the breeding season.



<i>No</i>	<i>Breed</i>	<i>Developed by &amp;/or country of origin</i>	<i>Imported to Australia</i>	<i>Parent Breeds</i>	<i>Breed Society in Australia</i>	<i>Distribution in Australia and Description</i>
	<b><i>Merino-Based Breeds</i></b>					
1h	Dohne Merino		1998	German Mutton Merino sires X Peppin-style Merino ewes	As above	The Dohne Merino is a synthetic dual-purpose Merino
1i	Fonthill Merino			American-bred Rambouillet Merino rams X fine-wool Saxon strain of Merino	As above	The major objective in developing the Fonthill Merino was to increase the genetic potential of an easy care type sheep to produce wool, meat and lambs. Since the Fonthill was established in the 1950s it has been subjected to selection methods primarily designed to further increase body weight and fertility without changing the type of wool produced or the yield per head. Fonthill ewes produce 20-22 micron wool with the amount of wool cut per head similar to that obtained from other Merinos running under similar conditions. Lambing average within a flock is 100 percent.
1j	South African Mutton Merino (South African Meat Merino)	German, then exported to South Africa in 1932	Mid 1990's		A breed society has been established in Australia.	This breed of sheep was originally known as the German Mutton Merino. The breed was recognised in 1971 when the name was changed to South African Mutton Merino. In South Africa it was bred to produce a suitable slaughter lamb at an early age while producing good quality wool (of 23 micron or finer) without the input of additional feeding. The breed is polled and the wool classified as strong to medium. In Australia it offers farmers an additional source of genetic material to produce sheep meat from a large framed sheep with a long loin. The breed could be used as a source for heavier lambs, as fat is not laid down in the carcass to a much later age than other sheep breeds.

<i>No</i>	<i>Breed</i>	<i>Developed by &amp;/or country of origin</i>	<i>Imported to Australia</i>	<i>Parent Breeds</i>	<i>Breed Society in Australia</i>	<i>Distribution in Australia and Description</i>
	<b><i>Merino-Based Breeds</i></b>					
2	Bond Corriedale	Australian breed established in 1909		Lincoln rams X stud Peppin Merino ewes,	Australian Bond Sheep Breeders Association Ltd “Bunyarra”, Urana, NSW 2645 Ph (02) 6920 8272	Originally known as the "Commercial Corriedale" or Bond Corriedale. It was bred to produce a soft handling, finer wool than the Corriedale. It is now recognised as a separate breed. The Bond has a large frame, is adaptable to a range of environments and has some resistance to fleece rot and blow-fly strike. This sheep grows a bulky fleece of 56s/58s count, with a fibre diameter of 25 to 27 microns, and a staple length of approximately 150mm. In the craft world, the fleece is used for fine to medium weight garments.
3	Comeback	Tasmania and Victoria		Merino X Corriedale and Polwarth		Similar to Merino but free of neck folds and lightly woolled around the points. Nostrils mottled, face white and free from wool. Polled or horned. The breed was first developed by crossing a British longwool cross back to the Merino. More recently Comebacks have been produced by crossing breeds such as the Corriedale and Polwarth with the Merino. Australia has approximately three million Comebacks which are mainly concentrated in cool wet areas. Although close to the Merino in type, Comebacks are selected to maximize production of meat as well as wool. Their wool is bulky with a staple length of more than 110mm and fineness ranging from 21-25 microns.
4	Cormo	Tasmania in the 1960's		Corriedale ram X Saxon Merino ewe		The Cormo is a fairly large, plain bodied, fast-growing, open-faced sheep. Mainly found in the far South Eastern zone of Australia. The name Cormo is from the names of two of the parent breeds, <b><i>Corriedale</i></b> and <b><i>Merino</i></b> .

<b>No</b>	<b>Breed</b>	<b>Developed by &amp;/or country of origin</b>	<b>Imported to Australia</b>	<b>Parent Breeds</b>	<b>Breed Society in Australia</b>	<b>Distribution in Australia and Description</b>
	<b><i>Merino-Based Breeds</i></b>					
5	Corriedale	Simultaneously in New Zealand and Australia in about 1874.		Lincoln X Merino	Australian Corriedale Association Inc. GPO Box 75B Melbourne 3001 Ph (03) 9817 6711 Fax (03) 9817 6125 <a href="http://www.corriedale.org.au">www.corriedale.org.au</a>	Dual-purpose sheep which is large framed, polled and produces a good carcass of either lamb, hogget, or mutton. Produces a bulky, high yielding fleece. Black feet and polled.
6	Hyfer	Australia		50% Dorset X 25% Booroola Merino X 25% Trangie Fertility Merino		Hyfer is a composite sheep breed. They have high spring joining ability for flexible year-round lamb production
7	Polwarth (Polled and Horned)	Victoria, Australia in 1880		Merino crossed with Lincoln X Merino 1 <sup>st</sup> cross	Polwarth Sheepbreeders Association of Australia (Fed) PO Box 108 Goodwood, SA, 5034 Ph (08) 8210 5211 Fax (08) 8231 4173 Polwarth Sheepbreeders Association of Australia (Vic) AB 120 Colac Vic 3249 Ph (03) 5233 4515 Fax (03) 5232 1421	The Polwarth is a dual-purpose sheep. It is large-framed, robust, free from wrinkles and produces a high-yielding, soft handling fleece. They will also yield a uniformly lean carcass suitable to a number of export markets. The breed has been successfully exported to many countries, particularly South America where they are known as "Ideals".
8	Border-Merino Crossbred				Australian Border Leicester Association Inc. "Cal Col", Deniliquin, NSW 2710 Ph (03) 5882 3338 Fax (03) 5882 3338	Second most popular breed in Australia, favoured for its well proportioned carcass, high fertility, robust constitution and good milk production. It has shown itself to be well-suited as a prime lamb mother for Australian conditions.
9	Zenith	Wheat zone of Victoria, Australia.		Lincoln & Merino		Similar to Merino, but free of neck folds. Lightly woolled around the points. Polled, mottled nostrils, face white.

<b>No.</b>	<b>Breed</b>	<b>Developed by &amp;/or country of origin</b>	<b>Imported to Australia</b>	<b>Parent Breeds</b>	<b>Breed Society in Australia</b>	<b>Distribution in Australia and Description</b>
	<b><i>Meat Sheep Breeds- short wool</i></b>					
10	Coolalee	Australia		Wiltshire Horn, Suffolk, Hampshire Down, Poll Dorset, Lincoln, English Leicester crossed over 8 years	Coolalee Sheep Breeders Association Inc. 'Milchomi', Bugaldie, NSW 2357 Ph: (02) 6843 8258 Fax: (02) 6843 8277	Commenced construction of the breed in 1968. First rams became commercially available in 1983. The breed is a terminal sire used for prime lamb production.
11	Dorset Down	England	1938	Southdown X Berkshire, Hampshire & Wiltshire	Dorset Down Breeders Association Inc PO Box 197 New Gisborne, Vic 3438 Ph (03) 5426 2140 Fax (03) 9903 9581	Terminal Sire in Prime Lamb Production. Fast maturing and robust breed.
12	Dorset Horn	England	1895		Australian Dorset Horn Breeders Association 82 Highett St Richmond, Vic 3121 Ph (03) 9428 4384 Fax (03) 9428 4384	Very square chunky appearance, long body and massive horns on both rams and ewes. Desired for their superior carcass composition and fast growth rates. Often mated to cross- bred ewes for the production of prime lambs.
13	East Friesian	East Friesland, Germany	1996			The German East Friesian milk sheep is the best known and most important of the Friesian breeds and is the breed known in the scientific literature as the "East Friesian". The East Friesian is reported as averaging 2.25 lambs with milk yield of 500-700 kg per lactation testing 6-7% milk fat, the highest average dairy milk yield recorded for any breed of sheep. Wool production is about 4.5 kg per ewe with a clean wool yield of 65% and a fineness of 50/56s / 48/50s (German Ministry of Agriculture). The mature weight of this breed is between 150 to

						200 pounds (70-90 kg). The East Friesian is considered to be the worlds highest producing dairy sheep
<b>No</b>	<b>Breed</b>	<b>Developed by &amp;/or country of origin</b>	<b>Imported to Australia</b>	<b>Parent Breeds</b>	<b>Breed Society in Australia</b>	<b>Distribution in Australia and Description</b>
	<b><i>Meat Sheep Breeds-short wool</i></b>					
14	Finnsheep		1993		The Australian Finnsheep Breeders Association (est 1993) Loddon Rise RMB 114 Inglewood, Vic 3517 Ph (03) 5437 3281 <a href="http://www.finnsheep.asn.au">www.finnsheep.asn.au</a>	The AFBA runs a Finn Leicester appendix for members who are stabilising a cross between the Finn and the Border Leicester and records details of Finn/East Friesian crosses. While its focus is primarily on maintaining records of registered sheep, the Association also promotes the breed and encourages, promotes, and carries out research into animal husbandry and genetics of relevance to purebred and crossbred Finnsheep in the Australian sheep flock.
15	Hampshire Down		1880		Australian Hampshire Down Breeders Association Cressy, Tasmania, 7302 Ph/Fax 903) 6397 6400	Primarily a meat producer with a fast growth rate. Face and ears dark brown approaching black. Polled
16	Poll Dorset	Australia		Dorset Horn & Ryeland	Australian Poll Dorst Association Inc. GPO Box 75B Melbourne 3001 Ph (03) 9817 6711 Fax (03) 9817 6125 <a href="http://www.polldorset.org.au">www.polldorset.org.au</a>	The most commonly used sire in the production of prime lambs in Australia supplying over 75% of the prime lambs produced annually. Main distinguishing features are it's hornless appearance, long-square body set on short legs, and 'spongy' short-stapled wool.
17	Ryeland	Herefordshire England	1919		Ryeland Sheepbreeders Association of Australia PO Box 125 Hamilton Vic, 3300 Ph (03) 5572 2210	The Ryeland is a Downs type sheep. It was one of the breeds used to introduce the poll gene to the Dorset breed in the development of the Poll Dorset. The Ryeland is a hornless, prime lamb producer. It carries a fine Downs-type wool, and is well regarded as a fertile, heavy milking breed specializing in the production of prime lambs. 10) It has a white face, black nostrils and dark feet.
18	Shropshire	Shropshire England	1850's		Australian Society of Breeders of British Sheep Ltd	Established as a breed in 1792. A hardy, small framed polled sheep, it has black points on its face,

					Royal Showgrounds, Epsom Rd Ascot Vale, 3032 Ph (03) 9281 7444 Fax 903) 9376 2973	legs and feet. It is has tasty meat and a dense fleece.
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<b>No.</b>	<b><i>Meat Sheep Breeds- short wool</i></b>	<b><i>Developed by &amp;/or country of origin</i></b>	<b><i>Imported to Australia</i></b>	<b><i>Parent Breeds</i></b>	<b><i>Breed Society in Australia</i></b>	<b><i>Distribution in Australia and Description</i></b>
19	South Dorset Down	New Zealand		Dorset Down X Southdown	c/o Australian Society of Breeders of British Sheep Ltd Royal Showgrounds, Epsom Rd Ascot Vale, 3032 Ph (03) 9281 7444 Fax 903) 9376 2973	Early maturing prime lamb with a high proportion of lean meat. Open faced with medium to dark points and light to medium skin pigmentation.
20	Southdown	Sessex, England	First Settlers		Southdown Australia inc. PO Box 91, Narre Warren, Vic 3804 Ph (03) 9796 8225	One of the smallest of sheep in Australia used in the production of prime lambs. When mated to Border-Merino ewes the resultant lambs grow rapidly into a marketable weight. Distinguishing features include its short square head, almost 'piggish' appearance, very square and long body. Wool is short and springy.
21	South Suffolk	New Zealand	1946		Australian South Suffolk Society "Kaybunda" PO Box 1084 young NSW, 2594 Ph (02) 6382 4534 Fax (02) 6382 3215	Developed in the South Suffolk is a fixed cross between the Suffolk and the Southdown. The breed is hornless with head, legs and feet brown to black. It is mainly used for the production of fast growing prime lambs.
22	Suffolk	England	1904		Suffolk Sheepbreeders Association of Australia Pine Ridge, c/o PO Strathalbyn SA, 5255 Ph (08) 8537 0422	The Suffolk is hornless, has a black head, legs and feet. It is a highly fertile meat breed that has become popular as a terminal sire because it yields a heavyweight lamb that is quite lean.
23	Texel	Isle of Texel in the province of	1993		Australian Texel Stud Breeders Association Inc.	The selected flock began quarantine in New Zealand in 1988. An objective selection

		Northern Holland Animals were selected from Denmark and Finland to suit Australian conditions			GPO Box 75B Melbourne 3001 Ph (03) 9817 6711 Fax (03) 9817 6125 <a href="http://www.texal.org.au">www.texal.org.au</a>	program was implemented. In February 1993, 790 ewes and 50 rams were selected from a base flock of 2220 available for import to Australia. The first Texels were born in Australia in September 1993. The first volume of the flock registry was produced in April 1994. The breed is a heavily muscled lean sheep, and is used for the production of prime lambs.
24	White Suffolk	Australia		Suffolk X Poll Dorsets	Australian White Suffolk Association Inc PO Box 108 Goodwood, SA 5034 Ph (08) 8210 5211 Fax (08) 8231 4173 <a href="http://www.whitesuffolk.org.au">www.whitesuffolk.org.au</a>	The clean face and points (free of wool) of White Suffolk sired lambs minimises grass seed problems. Rams are renowned for their natural fertility and libido and can be mated at any time of the year. When mated to White Suffolk sires, ewes will have minimal lambing problems.

<b>No</b>	<b>Breed</b>	<b>Developed by &amp;/or country of origin</b>	<b>Imported to Australia</b>	<b>Parent Breeds</b>	<b>Breed Society in Australia</b>	<b>Distribution in Australia and Description</b>
	<b><i>Meat Sheep Breeds – Long Wool</i></b>					
25	Border Leicester	Leicestershire, England	1871		Australian Border Leicester Association Inc. “Cal Col”, Deniliquin, NSW 2710 Ph (03) 5882 3338 Fax (03) 5882 3338	Large, robust hornless sheep with no wool on face or legs. Wool tends to be long and very coarse. Its main role is crossing with merino ewes to produce a first cross prime lamb mother.
26	Cheviot	Cheviot Hills, England/Scotland borders	1938		Cheviot Sheepbreeders’ Association of Australia 71 Duke St. Richmond, Vic 3121 Ph (03) 9428 1770	The breed is a longwool type, hornless, of reasonable frame and used mainly for prime lamb production suited to hilly country with high rainfall.
27	Coopworth	New Zealand	1976	Romney X Border Leicester	Coopworth Sheep Society of Australia Inc. RMB 4630 Portland Vic. 3305 Ph (03) 5526 5248 <a href="http://www.coopworth.org.au">www.coopworth.org.au</a>	The breed was developed in the 1950’s and formally established in 1968. Wool 33-38 micron, excellent for home spinning. There were 8 registered flocks at in Australia at 1 <sup>st</sup> June 2003.
28	English Leicester	England	1826		English Leicester Association of Australia inc. 40 Clark Rd Tynong North Vic 3813 Ph (03) 5942 8367 <a href="http://www.ballaratweb.net/elaa">www.ballaratweb.net/elaa</a>	English Leicesters were one of the first pure breeds to be imported into Australia in 1826. Large, polled sheep covered with long staple wool. Definite topknot with face white tending to blue and wedge- shaped. Suited to fertile high rainfall areas. The English Leicester Association of Australia Inc., was re-started in 1982, after a lapse of some time, to assist in the promotion of and ensure the survival of the breed. It was incorporated on 19th May, 1992.
29	Gromark	Northern NSW, Australia in 1965		Corriedale X Border Leicester	Gromark Society of Australia (est.1979) PO Box 426 Tamworth, NSW 2340 Ph (02) 6766 7044 Fax (02) 6761 3017	It is a dual-purpose sheep which evolved from objective selection for high growth rate and fertility with final selection being based on visual criteria - wool quality, frame and carcass attributes. The Gromark is a large-framed breed (ewes average 80kg) producing large lean lambs and good fleeces



					<a href="http://www.gromark.com">www.gromark.com</a>	with wool fiber diameter being about 27-33 microns.
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<b>No</b>	<b>Breed</b>	<b>Developed by &amp;/or country of origin</b>	<b>Imported to Australia</b>	<b>Parent Breeds</b>	<b>Breed Society in Australia</b>	<b>Distribution in Australia and Description</b>
	<b><i>Meat Sheep Breeds – Long Wool (contd)</i></b>					
30	Gotland	Established on the Swedish Island of Gotland from sheep brought back from Russia		Karakul and Romanov sheep		The modern Gotland sheep were developed by selective breeding. They are fine boned, of medium size, with a hornless black head sometimes with white markings and free from wool. They have a dense, long, lustrous grey fleece, occasionally white, black or brown.
31	Lincoln	England	Early 1980's		Australian Lincoln Society Inc. Glenfine Homestead PO Cape Clear, Vic 3351 Ph (03) 5342 2290 Fax (03) 5342 2292	Large, polled sheep covered with coarse wool. Large forelock of evenly-waved wool hanging over face. Suited to high rainfall areas.
32	Perendale	New Zealand (late 40's) & Australia (late 50's)		Cheviot X Romney	Australian Perendale Association RMB 1476, Piries-Gough Bay Rd Mansfield, Vic 3722 Ph (03) 5777 3670	A medium sized sheep showing Cheviot characteristics, it produces a fleece of 50s to 56s count, or a micron range of 28 to 32, approximately 120mm in length. In coloured flocks, the breed has declined in popularity in recent years, partly because of its flighty nature. The fleece is fairly springy and lacks the lustre of the British Longwool breeds. It is used by hand spinners for medium weight garments.
33	Romney	Kent marshes in England	1872		Australian Romney Association inc. 82 Highett St Richmond, Vic 3121 Ph (03) 9428 4384 Fax (03) 9428 4384	It is a polled breed, has a large frame and is an excellent mother. When crossed with English shortwoolled breeds it produces high quality prime lambs.

<i>No</i>	<i>Breed</i>	<i>Developed by &amp;/or country of origin</i>	<i>Imported to Australia</i>	<i>Parent Breeds</i>	<i>Breed Society in Australia</i>	<i>Distribution in Australia and Description</i>
	<b><i>Fat Tail Sheep</i></b>					
34	Awassi	Arabian Peninsular	Mid 1980's			Fat-tailed sheep. Carpet type wool, fleece is brown to white. Estimated numbers were 400,000 Merino/Awassi cross sheep in Western Australia in 2001.
35	Karakul	Iran & Afganistan	1985			This sheep is multi purpose: pelt, fleece and meat. It has a long, lustrous fleece, usually black, but can be red, brown and white. It is estimated there are 260,000 Karakul/Merino ewes in WA. Australian Total: 260,000
36	Damara	South Africa	1996		Damara Breeders group 2 Shiela St Mosman Park, WA 6012	A fat tail sheep with high fertility. First imported into Western Australia. It sheds its fleece that can be of different colours (tan, brown, black and white spotted). The fleece consists of hair with a fine layer of wool. It was estimated that in 2001 there were 7,000 pure Damara in WA, 2,000 in SA, 500 in NSW and 800 in Qld. It is estimated there are 100,000 Damara/Merino cross ewes in WA, 70,000 in SA, 30,000 in NSW and 24,000 in Qld Australian Total: 234,300.

<b>No</b>	<b>Breed</b>	<b>Developed by &amp;/or country of origin</b>	<b>Imported to Australia</b>	<b>Parent Breeds</b>	<b>Breed Society in Australia</b>	<b>Distribution in Australia and Description</b>
	<b><i>Carpet Wool Breeds</i></b>					
37	Carpetmaster			Border Leicester cross Romney ram X Perendale ewe.		The Carpetmaster has the easy-care attributes of the Perendale, with a higher fleece weight. The fibre diameter is 40 micron and has a staple length of 150mm. In common with other carpet-wool breeds, it has high yielding, heavily medullated wool.
38	Elliotdale	CSIRO Elliott Research Station in Tasmania, Australia in 1963- 1968		Tasmanian Romney	Elliotdale Sheepbreeders Society PO Box 199 Dandenong, Vic 3175 Ph (03) 9793 5605 Fax (03) 9790 0755	The Elliotdale is similar to the Romney, with cleaner points and a carpet-wool fleece of 38-40 micron diameter. Rams may be horned or polled but ewes are always polled. The breed also has many prime lamb features, producing quick growing lambs of excellent quality.
39	Drysdale	New Zealand	1975		The Australian Drysdale Sheep Breeders' Association (est 1979) RMB 2465 Kilmany Vic 3851 Ph (03) 5149 2250 Fax (03) 5149 2257	Numbers of Drysdales have increased steadily. In 2003 there were 10 000 Romney and Drysdale ewes being mated to Drysdale rams in Australia, 118 registered stud breeders plus over 200 commercial breeders of Drysdale sheep. The breed has spread to New South Wales, Victoria, Tasmania, South Australia and Western Australia.
40	Tukidale		1975	New Zealand Romney	Tukidale Sheep Society of Australia Blackwood Park, North Purnim Vic. 3278 Ph/Fax (03) 5567 1148	It is stocky in appearance and produces an extremely long stapled fleece of very coarse wool. The breed is very robust and hardy, with the fleece being ideal for carpet-wool production. The wool is highly medullated, harsh to handle and chalky white. It grows at approximately 2.5cm per month. These characteristics give carpets resilience, hard-wearing qualities and the ability to accept dyes readily. As with other carpet-wool breeds, Tukidales require shearing every six months.

<b>No</b>	<b>Breed</b>	<b>Developed by &amp;/or country of origin</b>	<b>Imported to Australia</b>	<b>Parent Breeds</b>	<b>Breed Society in Australia</b>	<b>Distribution in Australia and Description</b>
	<b><i>Wool-Shedding Sheep breeds</i></b>					
41	Dorper	Developed in South Africa in the 1930's	1996	Blackhead Persian ewes with a Dorset Horn ram	Dorper Sheep Breeder's Society of Australia Inc. PO Box 108 Goodwood, SA, 5034 Ph (08) 8210 5211 Fax (08) 8231 4173 <a href="http://www.dorper.com.au">www.dorper.com.au</a>	The breed has the potential to be developed for domestic and export meat markets. It is a mutton breed with a high lambing percentage. It is now numerically the second largest sheep breed in South Africa. Its fleece is wool and hair which is shed if not shorn regularly. It mostly has a black head. Its pelt is most sought after. It is estimated there are 1,500 pure Dorper in WA 10,000 Dorper/Merino crosses in WA, & 5,000 in NSW. Australian Total: 16,500
42	Wiltipoll	Australia		Wiltshire Horn, Border Leicester, Poll Dorset and Poll Merino sheep	Australian Wiltipoll Association Inc (1996) PO Box 620 Strathalbyn, SA 5255 <a href="http://www.wiltipoll.com">www.wiltipoll.com</a>	The Wiltipoll is a sheep developed for the traditional heavy prime lamb market. Like the Wiltshire Horn it sheds its wool and requires no shearing. The advantages of the wool shedding are that costs are cut dramatically, and that there is no need for shearing, crutching, jetting, dipping or mulesing. Requirements for registration of Wiltipoll sheep state that the sheep must have no less than 96.87% Wiltshire Horn blood, it must be polled and must totally shed its fleece annually. To achieve the required percentage of Wiltshire Horn blood, a ewe of a polled breed must be first crossed with a pure bred Wiltshire Horn ram and then back -crossed successively for four generations.
43	Wiltshire Horn	Wiltshire, England	1952		Australia Wiltshire Horn Sheepbreeders' Association Pickwick, Gunaroo Rd Gunaroo, NSW 2620 Ph (02) 4845 1552 Fax (02) 4845 1519 <a href="http://www.wiltshirehorn.asn.au">www.wiltshirehorn.asn.au</a>	A breed society was first formed in UK in 1923. A key feature of the Wiltshire Horn is that it sheds its wool and does not require shearing. Wiltshires now have the third highest number of studs of all the British breeds (behind Border Leicesters and Suffolks) so they are no longer a rare breed. Of 195 Wiltshire studs that have been started, 76 still exist.

## Number of Registered Breeding Ewes in Australia

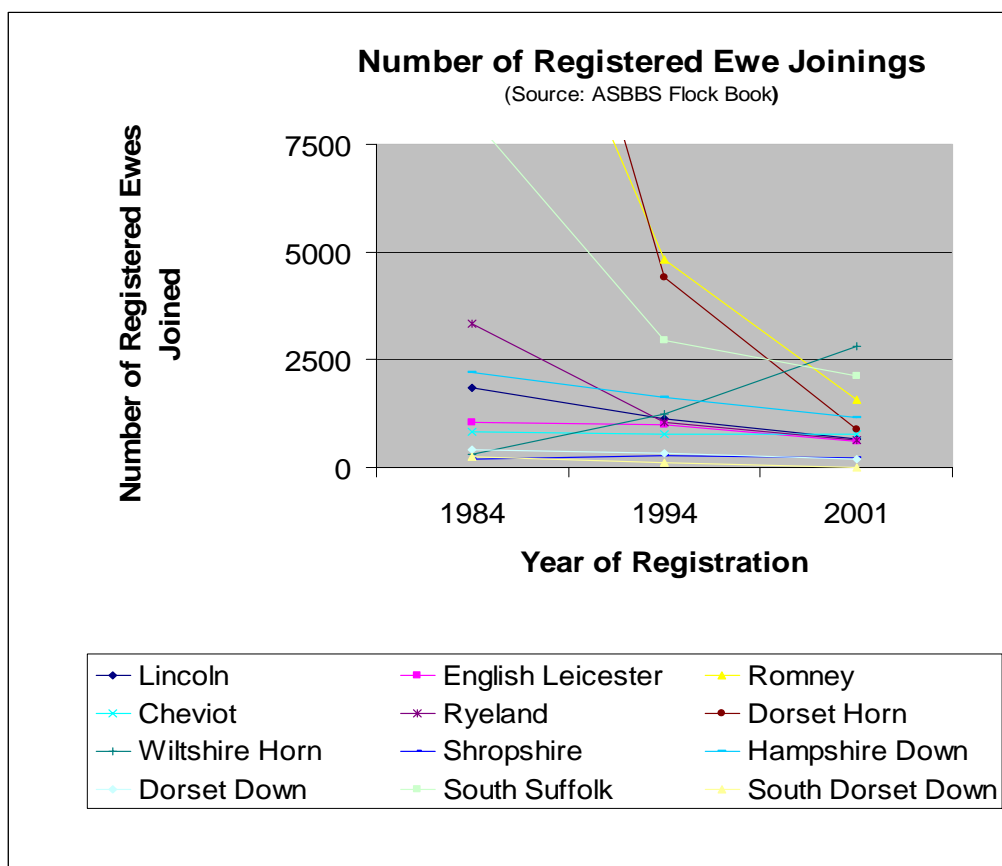
In 2000, the total number of breeding ewes in Australia was estimated by Australian Bureau of statistics to be 50 million. Approximately 42.5 million of these were Merino, 5 million were crossbreds, and the remaining 2.5 million purebred sheep were from approximately 40 other breeds as listed above. The statistics do not differentiate between registered and non-registered animals and the numbers are therefore not indicative of genetic integrity or merit.

The graph below does not include all sheep breeds in Australia. It includes twelve breeds currently being registered by the Australian Society of Breeders of British Sheep Ltd. (ASBBS).

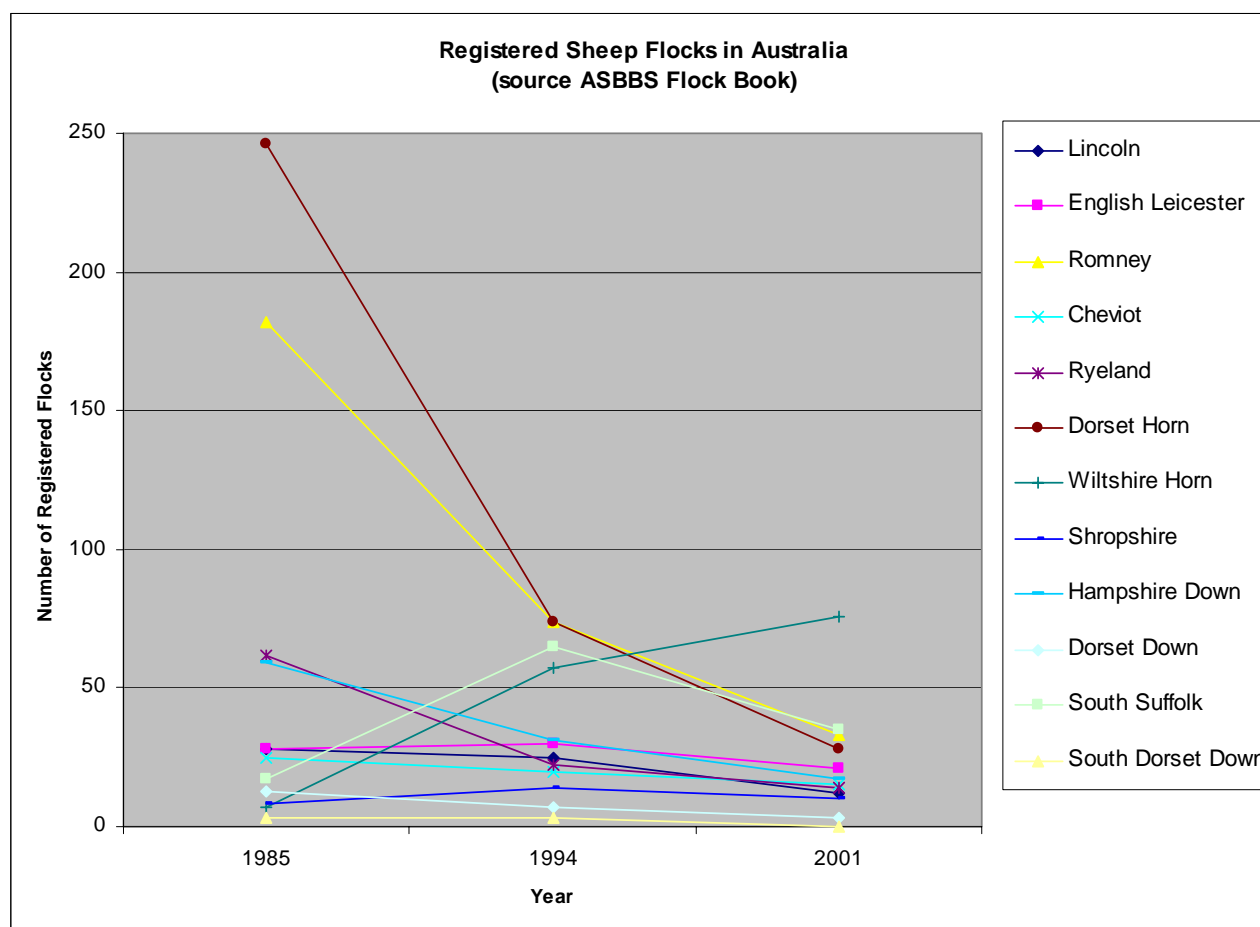
What is interesting in the graph below is the downward trend of all breeds with the exception of the Wiltshire Horn (and to a lesser extent South Suffolk which has shown a small increase). As recently as 10 years ago, the Wiltshire Horn breed was considered critically endangered in Australia. It has in recent years enjoyed a revival with increasing demand for the breed as shown by the registered ewe numbers and the number of registered flocks.

All other ten breeds are continuing their decline with falling numbers of ewes being bred.

### NUMBERS OF BREEDING EWES REGISTERED IN AUSTRALIA BY ASBBS



## NUMBERS OF FLOCKS IN AUSTRALIA REGISTERED BY ASBBS



## RARITY STATUS OF SHEEP BREEDS IN AUSTRALIA IN 2004

(Ranked by RBTA according to their criteria).

Status	Breed
<b>EXTINCT OR LOST TO AUSTRALIA</b>	<ul style="list-style-type: none"> <li>• Cotswold</li> <li>• North Devon</li> <li>• Teeswater</li> </ul>
<b>CRITICAL</b> < 300 breeding ewes	<ul style="list-style-type: none"> <li>• Horned Polwarth (Aust only)</li> <li>• Camden Merino (Aust only)</li> <li>• Carpetmaster (NZ, Aust)</li> <li>• Booroola Merino (Aust only)</li> <li>• Zenith (Aust only)</li> <li>• Shropshire</li> <li>• Dorset Down</li> <li>• Elliotdale (Aust only)</li> <li>• South Dorset Down</li> <li>• Cormo</li> </ul>
<b>ENDANGERED</b> <500 breeding females	<ul style="list-style-type: none"> <li>• Lincoln</li> <li>• English Leicester</li> <li>• Ryland</li> <li>• Drysdale (estimate only)</li> <li>• Tukidale (estimate only)</li> </ul>
<b>VULNERABLE</b> < 900 breeding ewes	<ul style="list-style-type: none"> <li>• Cheviot</li> <li>• Hampshire</li> <li>• Dorset Down</li> </ul>
<b>AT RISK</b> <1500 breeding ewes	<ul style="list-style-type: none"> <li>• Romney</li> </ul>
<b>RECOMMENDED FOR INVESTIGATION</b>	<ul style="list-style-type: none"> <li>• Perendale</li> <li>• Coopworth</li> <li>• Gromark</li> </ul>
<b>NEW CREATIONS OR INTRODUCTIONS</b>	<ul style="list-style-type: none"> <li>• East Friesians (87 breeding ewes)</li> <li>• Texeldown (279 breeding ewes in 2003)</li> <li>• Wiltipol (431 breeding ewes in 2003)</li> <li>• Aust Finn (204 breeding ewes in 2003)</li> <li>• Centre Plus (unknown)</li> </ul>



## **Poultry and Waterfowl**

Poultry breeds in Australia serve two major functions: the provision of meat and eggs.

### **Australian Industry Overview- Egg Production**

In the year ended 30<sup>th</sup> June 2000 approximately 2.19 billion eggs were produced in Australia from a national flock of just over 12 million hens (Australian Bureau of Statistics - Agricultural Commodities 7113.0 1999-2000). A preliminary estimate of the gross value of egg production for the year 2001 is approximately \$333 million (Australian Bureau of Statistics - Value of Agricultural Commodities 7501.0 2000-2001). The majority of eggs are produced by 1,117 commercial establishments but approximately 25 million dozen eggs (just 0.1% of the nations production) come from “backyard” non-commercial operations.

Cages are the dominant production system in Australia. Approximately 85% of shell eggs sold in Australian supermarkets are from intensive cage systems. An alternative system evolving in the Australian egg industry is the barn system that accounts for approximately 4% of Australian supermarket shell egg sales. Free range production systems account for about 11% of Australian supermarket shell egg sales.

Australia ranks number 37 in the world in terms of egg production with approximately 13 million layers producing 155,000 tons of eggs. In the year ended June 1998, Australia exported approximately 1,250 ton (645 ton as shell egg and 614 ton as egg product) of eggs that accounts for just under 1% of our total production.

There are 4 major breeds of birds used in the Australian egg industry and all have been imported into Australia over the last 10 years. The 4 breeds of bird are the Hisex, ISA, Hy-line and Lohmann Brown. The 4 breeds of bird account for approximately 98% of all egg layers in Australia and, as a result of consumer preference, all are brown egg layers. The benefits of the imported layers over the previous breeds used include the precocious onset of production, early large egg size and a smaller bird with superior feed conversion.

### **Australian Industry Overview –Meat Production**

The Australian chicken meat industry has undergone enormous changes since its emergence as a specialist industry in the late 1950's. It has grown from an industry that produced approximately 3 million broilers in 1950-51 to producing approximately 400 million broilers (approximately 570,000 tonnes dressed weight) annually.

Poultry meat (~95% is chicken) has now become the second most consumed meat in Australia (30.8 kg per person annually in 1998-99) with a gross value of \$1,174.3 million.

There are 5 major chicken meat processors in Victoria (Bartter-Steggles, La Ionica, Hazeldenes, Inghams, and Baiada). Each of these organisations either own or directly control each stage of production from the breeding and hatching of chicks through to the processing and marketing of the final product.

In the early days of the commercial industry, most of the chickens used represented pure breeds or varieties. Today, most of the genetics used in commercial egg and meat industries in Australia are synthetic or hybrid lines of meat chickens. These are usually known by the name of the breeding company and a code which identifies its strain, such as 'Cobb 533', 'Ross 121', 'Lohmann 97'. There are currently two major genotypes used in the Victorian chicken meat industry. The two genotypes, the Ross bird and the Cobb bird, are derived from stock imported from the UK and the US respectively.

The important characteristics selected for in broilers are growth rate, feed conversion and carcass processing characteristics. The modern commercial broiler strains are capable of achieving liveweights of 2.8 kg at 49 days of age with feed conversion of less than 1.9 kg of feed per kg of liveweight.

Most of the meat breeds of chickens used in today's commercial breeding programs, have been developed using the following pure breeds: New Hampshire, White Plymouth Rock, Cornish or Indian Game, Barred Plymouth Rock, Light Sussex, Australorp and Rhode Island Red

## **Breeds of Poultry and Waterfowl in Australia**

There is no registration process for pure poultry breeds in Australia and this makes it very difficult to assess the numbers and genetic integrity of individual breeds. Pure breeds of poultry are classified according to categories, (e.g. heavy breed, light breed) and sub categories (e.g. soft feather, hard feather). Breeds are then further categorized according to variations of colour- of which many exist.

A number of breeds have been modified in size over time to be represented as bantams – smaller versions of the original breed. Some breeds, such as the Japanese, Seabright and Rosecomb exist naturally as bantams and have no larger counterparts. Rare Breeds Trust of Australia currently only considers naturally occurring bantams in its priority listings as it does not consider created bantam breeds to be true examples of domestic farm livestock.

It has long been a problem in Australia gaining access to accurate figures on numbers of purebred animals in existence.

The table below lists each of the breeds currently known to exist in Australia, with all their colour variations. The list may be incomplete and requires more research. The list also does not in itself make any guarantee as to the purity of the birds purported to be in existence.

## BREEDS OF POULTRY AND WATERFOWL IN AUSTRALIA

<b>Class</b>	<b>Breed- full size</b>	<b>Type/Colours</b>	<b>Breed-Bantam size</b>	<b>Type/Colours</b>
Poultry				
Heavy Breed Hard Feathered	Australian Game	Black-red, blue-duckwing, Blue-red, Gold-duckwing, Partridge, Pile, Silver Duckwing, white	Australian Game	Black-red, Gold-duckwing, Silver Duckwing,
	Australian Pit Game	muffed	Australian Pit Game	muffed
	Indian Game	Dark, white	Indian Game	Blue-laced, Dark, white
			Jubilee Game	
	Jungle Fowl			
	Malay	Black-red, Buff, Duckwing, Pile, White	Malay	Black-red, Birchen, Pile,
	Modern Game		Modern Game	Black red, Birchen, Black, Brown red, Crele, Duckwing gold, Duckwing Silver, lemon blue, pile.
	Old English Game	Black red dark leg, Black red light leg, Blue red, Blue, Brown red, Crele, Duckwing blue, Duckwing gold, Duckwing silver, Ginger, Grey, Pile, Spangled,	Old English Game	Black red partridge dark leg, Black red partridge light leg, Black red Wheaten, Blue red, Blue spangled, Blue tailed wheaten, Birchen, Black, Blue, Brown red, Crele, Cuckoo, Duckwing blue, Duckwing gold, Duckwing silver, Pile, Spangled, White.
Heavy Breed Soft Feathered			Antwerp	Bearded
	Australorp		Australorp	
	Barnevelder	Dark	Barnevelder	
	Brahma	Dark, Buff Columbian, Light, Gold, White	Brahma	Dark, Buff Columbian, Light, Gold, White
	Cochin	Cochin buff	Cochin	
	Dorking	Silver, Silver grey,	Dorking	Silver
	Faverolles		Faverolles	
	Frizzle	Black, Blue, Buff ,Crele, Cuckoo, Duckwing, Lavender, Red,	Frizzle	Black, Blue, Buff ,Crele, Cuckoo, Duckwing, Red, white
	Croad Langshan	Black		

	Australian Langshan	Blue, Black, White	Australian Langshan	
	New Hampshire		New Hampshire	
	Orpington	Black, Blue, Buff, Cuckoo, White	Orpington	Black, Blue, Buff, Cuckoo, White
	Plymouth Rock	Barred, Dark, Dark barred, Light barred	Plymouth Rock	Barred, Dark, Dark barred, Light barred
<b>Class</b>	<b>Breed- full size</b>	<b>Type/Colours</b>	<b>Breed-Bantam size</b>	<b>Type/Colours</b>
			Pekin	Birchin, Black, Blue, Buff Columbian, Columbian, Cuckoo, Mealy grey, Mottled, Partridge, Splashed, Wheaten, White.
	Rhode Island	Red, Rosecomb, White	Rhode Island	Red, White
	Sussex	Lavender, Light, Silver, Speckled,	Sussex	Light, Silver, Speckled
	Transylvanian Naked Neck		Transylvanian Naked Neck	
	Wyandotte	Barred, Black, Buff, Columbian, Gold-laced, Golden Crele, Partridge, Red, Silver-laced, Silver-pencilled, White,	Wyandotte	Blue laced, Black, Blue, Buff, Buff-Columbian, Columbian, Cuckoo, Gold-laced, Golden crele, Partridge, Red, Silver-laced, Silver-pencilled, White,
Light Breed Soft Feathered	Ancona	Black	Ancona	Black
	Andalusian		Andalusian	
	Aracana	Black, Lavender, Partridge	Aracana	Black, Lavender, Partridge
	Barnevelder	Dark	Barnevelder	Dark
			Belgian Barbu d'Anvers	Mottled, quail, Quail blue, Blue, Cuckoo, Silver millefleur, White
			Belgian Barbu d'Uccles	Black, Blue, Lavender, Millefleur, Mottled, Porcelaine, Blue Quail, Cuckoo, Quail, Silver Millefleur, White
	Campine	Gold, Silver	Campine	Gold, Silver
	Hamburg	Black, Buff, Gold-spangled, Silver spangled	Hamburg	Black, Gold-pencilled, Gold-spangled, Silver penciled, Silver-spangled
	Houdan	Mottled, White	Houdan	
			Japanese	Black, Birchen or grey, Black tailed, Black Tailed white, Blue, Wheaten, White
	Leghorn	Blue red, Black, Blue, Brown, Buff, Cuckoo, Duckwing Gold, Duckwing Silver, Pile Red, White	Leghorn	Blue red, Black, Blue, Brown, Buff, Cuckoo, Duckwing Gold, Duckwing Silver, Pile Red, White
	Minorca		Minorca	Black, Blue

	Polish	Cuckoo, Frizzled black, Frizzled blue, Frizzled cuckoo, Frizzled gold laced, Frizzled Silver laced, crested mottled, Frizzled white crested blue, Gold laced, Silver laced, White crested mottled, White crested self, White frizzled	Polish	Frizzled Silver laced, Frizzled white crested black, Silver laced, White crested black
<b>Class</b>	<b>Breed- full size</b>	<b>Type/Colours</b>	<b>Breed-Bantam size</b>	<b>Type/Colours</b>
			Rosecomb	
			Seabright	Gold, Silver.
	Silkie	Bearded, Black, Blue, Buff, Partridge, Silver White,	Silkie	Bearded, Black, Blue, Buff, Partridge, Silver White,
	Spanish	Black, Blue, Cuckoo, Gold, Red, White	Spanish	Black, Blue, Cuckoo, Gold, Red, White
	Welsummer			
Ducks- Large	Aylesbury			
	Blue Swedish		Black East Indian	
	Campbell		Call	
	Cayuga		Chocolate bibbed	
	Crested			
	Elizabeth			
	Indian Runner			
	Mallard			
	Muscovy			
	Orpington			
	Pekin		Orpington	
	Rouen			
	Saxony			
	Silver Appleyard		Saxony	
	Welsh Harlequin		Silver Appleyard	
	African			
Geese				
	Chinese			
	Crested			
	Egyptian			
	Embden			
	Pilgrim			
	Pomeranian			

	Roman			
	Sebastopol			
	Toulouse			
Turkeys				

## RBTA Basis for Defining Rare Breeds of Poultry

RBTA requires that poultry breeds can be shown to have existed continuously for 40 years. In the absence of registry records for poultry, RBTA recognizes breeds described in the current Australian Poultry Standards, and seeks to determine genetic purity by way of statutory declarations by breeders. Other breeds must have contributed less than 20 percent of the genetic makeup of the breed in the last six generations, and the parent breeds used in the formation of the breed must no longer be available in Australia for them to be considered as a rare breed.

Once the above four criteria are assessed and the breed determined to qualify, the rarity status of breeds of poultry and waterfowl is determined by applying the numerical basis in the table below:

### NUMERICAL BASIS FOR DEFINING RARE BREEDS OF POULTRY AND WATERFOWL IN AUSTRALIA

Critical	Fewer than 100 purebred breeding pairs
Endangered	Fewer than 200 purebred breeding pairs
Vulnerable	Fewer than 300 purebred breeding pairs
At Risk	Fewer than 500 purebred breeding pairs

Other factors used when assessing the rarity status of breeds of poultry and waterfowl include trends in breed numbers (e.g. are numbers decreasing rapidly?) and the proximity of distinct breeding groups (e.g. is the breed found in fewer than four distinct units, which are more than 100km apart?) and global populations (are there significant numbers of the breed overseas?). Answers to these questions may give the breed a higher priority within the list, or may even permit a breed that does not qualify otherwise to be included.

### Rare or Endangered Breeds of Poultry and Waterfowl in Australia (Source – RBTA)

The numbers of pure bred poultry of the four breeds which have been uniquely created in Australia (Australorp, Australian Game, Australian Pit Game and Elizabeth duck), are small except for the Australorp. The table below lists minor breeds of poultry and waterfowl that are currently in Australia. **Breeds/strains shown in bold and underlined are Australian creations.**

## ENDANGERED BREEDS OF POULTRY AND WATERFOWL IN AUSTRALIA

	<i>Turkey Varieties</i>	<i>Breeds of Geese</i>	<i>Duck Breeds</i>	<i>Poultry Strains (&gt; 40years).</i>	<i>Poultry Breeds/Strains not known to be &gt;40 years *</i>
Status	Breed	Breed	Breed	Breed	Breed
<b>Critical</b> Fewer than 100 breeding pairs	Black Narragansett Royal Palm Bourbon Red White (Other than commercial)	African Chinese (white) Crested Roman Pilgrim Pomeranian Sebastapol	Aylesbury Black East Indian Campbell (dark) Crested Indian Runner ( varieties other than white or fawn & white) Orpington (buff) Saxony Welsh Harlequin	Campine, John Hobbs Strain <u><b>Australorp, Judson Strain</b></u>	<u><b>Standard Soft Feather</b></u> Australorp (white) Autosexing Breeds Hamburg (penciled) Langshan(Croad) <u><b>Orpington (white)</b></u> <u><b>Plymouth Rock (other than barred)</b></u> Plymouth Rock (light barred) Spanish Red Sussex <u><b>Standard Hard Feather</b></u> Malay Game Red Jungle Fowl
<b>Endangered</b>	Slate	Exhibition Toulouse	Blue Swedish Campbell (white) Cayuga <u><b>Elizabeth</b></u> Muscovy (other than white or black & white) Silver Appleyard	Leghorn, White CSIRO Strain	<u><b>Standard Soft Feather</b></u> Ancona Andalusian <u><b>Australorp (blue)</b></u> Campine Silver Grey Dorking Faverolles (Salmon) Hamburg (gold spangled) <u><b>Langshan, Australian (blue, white)</b></u> Leghorn (pile, buff, duckwing) Orpington (black) Polish Rhode Island (rosecomb, white) Silkie (other than black, white) Sussex (speckled) Transylvanian Naked Neck Wyandotte (buff, Columbian, crele, gold-laced) <u><b>Standard Hard Feather</b></u> <u><b>Australian Game</b></u> <u><b>Australian Pit Game</b></u> Old English Game (black-red L/L, partridge L/L, partridge D/L, pile L/L, pile D/L) Phoenix <u><b>Bantam Soft Feather</b></u> Pekin (birchen, brown-red, cuckoo) Sebright Rosecomb (other than black)



# ENDANGERED BREEDS OF POULTRY AND WATERFOWL IN AUSTRALIA continued

	<i>Turkey Varieties</i>	<i>Breeds of Geese</i>	<i>Duck Breeds</i>	<i>Poultry Strains (&gt; 40years).</i>	Poultry Breeds/Strains not known to be >40 years *
Status	Breed	Breed	Breed	Breed	Breed
<b>Vulnerable</b>	Bronze	Chinese (brown) Emden Toulouse	<b><i>Indian Runner (fawn &amp; white)</i></b>  Rouen Campbell (khaki) Muscovy (white, black & white) Pekin	Bronze turkey, King Island strain	<b><u>Standard Soft Feather</u></b> Araucana (Lavender strain) Barnevelder (doubled laced) Frizzle Hamburgh (black, silver spangled) Leghorn (brown, black, blue) New Hampshire Orpington (blue & buff) Welsummer
<p><i>Watch:</i> Barbu d' Anvers (other than quail, lavender, black) Barbu d' Uccle (other than millefleur &amp; porcelaine) Barbu d' Watermeal, Pekin (varieties other than black, white, blue and buff and those listed under <i>Rare</i> and <i>Vulnerable</i>)</p> <p>* Only True Bantams, those which have no large counterpart, are included in these lists)</p>					
					<b><u>Bantam Soft Feather</u></b> Japanese Pekin (mottled)

## **Horses**

### **Horse Industry Overview**

Horses hold an important place in Australian history and in everyday life. Over the last century, mechanisation, changes to transport, and the rising costs of land and livery have seen the focus of the equine industry change from one of necessity and demand to one of pleasure and sport. With this change comes the demand for a different type of animal. Consequently, numbers of the heavy breeds are declining.

The most limiting factor to surveying the total number of horse breeds and individuals in Australia is the complication brought about by the registration process. Purebred horses are usually registered with their appropriate stud or herd book and are identified using a number of different methods: branding, tattooing, whorl and colour mark recording, micro-chipping, and DNA testing are the most common. The registration process is proof of breeding and pedigree (more so if DNA testing is applied).

Because there are so many breeds existing in Australia the level of administration varies greatly from international studbooks to locally run and administered breed societies. The administration of some studbooks is run by companies. The Royal Agricultural Society in each state performs registration services for some breeds and still more are registered by individual breed societies. It is not uncommon for societies to tender out the process of registration.

The importation of breeding animals to Australia is an extremely costly exercise but is generally well represented in racing circles with “shuttle” stallions spending seasons on either side of the globe. For other breeds, the number of new imports is relatively low with those arriving usually associated with the highly commercial breeds such as Warmblood sport horses. Other minority breeds will see a handful of new animals limited to individual breeders. Very few breeds see a huge influx of new genetics through the arrival of live animals.

## BREEDS OF HORSES IN AUSTRALIA

This list has been prepared by RBTA and is indicative of the breeds found in Australia but is by no means complete. Rare Breeds are marked by an asterisk. This list is still under review.

No.	<i>Breed</i>	<i>Developed by &amp;/or country of origin</i>	<i>Imported to Australia</i>	<i>Parent breeds</i>	<i>Breed Society in Australia</i>	<i>Description and Distribution in Australia</i>
1	Andalusian *	Spanish province of Andalusia.			Andalusian Horse Association of Australia P.O. Box 266 Torquay, Victoria, 3228 Ph (03) 5263 3402 Fax (03) 5263 3403	
2	Australian Stockhorse				The Australian Stock Horse Society, Ltd. (1971) P. O. Box 288, 92 Kelly Street Scone NSW 2337 Australia Tel: (065) 45 1122 Fax: (065) 45 2165 Web Site: <a href="http://www.ashs.com.au">www.ashs.com.au</a>	
3	Australian Pony			Thoroughbred, English Hackney pony and Hackney horse, Arab, Welsh Mountain and Cob type, Timor, Hungarian pony and Exmoor bloodlines were the main contributors	Australian Pony Stud Book Society Inc (1931) 103 Copperfield Street P.O. Box 57 Geebung QLD 4034 Ph: (07) 3216 2011 Fax: (07) 3216 2509 <a href="http://www.apsb.asn.au">www.apsb.asn.au</a>	Not exceeding 14 hands high. The Australian pony evolved from the blending of the various breeds of horses and ponies imported into Australia from the early 1800's onward. The stud book has been closed to most outside breeding since 1960. The only cross still allowed by the Stud Book is the cross with a Welsh Section A or B. This outcross is gradually being phased out and it is intended that the Australian pony section will be closed completely in 2005

4	Australian Draught Horse					
5	Australian Brumby (wild)					
6	American Saddlebred					
7	Arabian <ul style="list-style-type: none"> <li>• English (Crabbet)</li> <li>• Polish</li> <li>• Egyptian</li> </ul>				Arabian Horse Society of Australia Limited (1975) 226 George Street Locked Bag No 6, Windsor, NSW. 2756 Australia Ph (02) 4577 5366 Fax (02) 4587 7509 <a href="http://www.ahsa.asn.au">www.ahsa.asn.au</a>	
8	Appaloosa					
9	Belgian Draught*					
10	Belgian Warmblood					
11	Caspian*					
12	Cleveland Bay*					
13	Clydesdale*					
14	Connemara*	<i>Ireland</i>	<i>1963</i>	Descended from the primitive native stock interbred with the Spanish horses that swam ashore from the wrecks of the Spanish Armada. Arab, Thoroughbred and Irish Draught blood have also contributed.	Australian Pony Stud Book Society Inc (1931) 103 Copperfield Street P.O. Box 57 Geebung QLD 4034 Ph: (07) 3216 2011 Fax: (07) 3216 2509 <a href="http://www.apsb.asn.au">www.apsb.asn.au</a>	Distinguishing features of the Connemara Pony are hardiness of constitution, staying power, intelligence and soundness.

<b>15</b>	Coffin Bay Pony* (wild, South Australia)			<b>Timor Pony</b>		
<b>16</b>	Danish Warmblood					
	Dales	Eastern side of the Pennines, England, in Northumberland, County Durham and Yorkshire			Australian Pony Stud Book Society Inc (1931) 103 Copperfield Street P.O. Box 57 Geebung QLD 4034 Ph: (07) 3216 2011 Fax: (07) 3216 2509 <a href="http://www.apsb.asn.au">www.apsb.asn.au</a>	This breed is one of the heaviest of Great Britain's native pony breeds, and there is a strong likeness to the Welsh Cob. It has been employed for carting and farmwork, as well as being used in local trotting races. The maximum allowed height of the breed is 14.2hh, but can be smaller. The colour is predominantly black, with dark brown and grey being permitted.
<b>17</b>	Dartmoor*					
<b>18</b>	Exmoor (1)*					
<b>19</b>	English Riding Pony					
<b>20</b>	English Spotted Pony*					
<b>21</b>	Fjord*				Australian Pony Stud Book Society Inc (1931) 103 Copperfield Street P.O. Box 57 Geebung QLD 4034 Ph: (07) 3216 2011 Fax: (07) 3216 2509 <a href="http://www.apsb.asn.au">www.apsb.asn.au</a>	
<b>22</b>	Falabella					

23	Freisian*	northern province of Friesland in The Netherlands			Australian Friesian Horse Society (1983) 23 Mariemont Ave, Beaumaris, Victoria 3193. Ph: (03) 9589 1605	Always jet-black with a long flowing mane and tail, often to the ground. He carries his noble head on a crested neck. His action is flamboyant and eye-catching. He can be driven, ridden, jumped, likes working on the land or performing in the circus. He is one of the most versatile breeds of the world.
24	French Warmblood					
25	German Warmblood					
26	<b>Greenbank Army Barracks Brumby</b>				Brumby Protection Group PO Box Q476, Sydney 1230 <a href="http://www.thebrumby.org">www.thebrumby.org</a> email: <a href="mailto:brumbypg@yahoo.com.au">brumbypg@yahoo.com.au</a>	
27	<b>Guy Fawkes River National Park Brumby</b>	<b>Australia</b>			The Australian Brumby Heritage Society “Kararly” 7 Wattle Drive Arding via Armidale NSW 2350	
28	Highland*(60)				Australian Pony Stud Book Society Inc (1931) 103 Copperfield Street P.O. Box 57 Geebung QLD 4034 Ph: (07) 3216 2011 Fax: (07) 3216 2509 <a href="http://www.apsb.asn.au">www.apsb.asn.au</a>	
29	Hackney Horse*					
30	Hackney Pony*				Australian Pony Stud Book Society Inc (1931) 103 Copperfield Street	

					P.O. Box 57 Geebung QLD 4034 Ph: (07) 3216 2011 Fax: (07) 3216 2509 <a href="http://www.apsb.asn.au">www.apsb.asn.au</a>	
31	Hannovarian					
32	Hafflinger*					
33	Icelandic (2)*					
34	Irish Sporthorse					
35	Irish Draught*					
36	<b><i>Kosciusko Brumby</i></b>					
37						
38	Lippizaner*					
39	Lusitano	Portugal	August 2002	The Sorraia, believed to have developed from crosses between native Iberian Proto Draft Horses (Equus Caballus Caballus of Western Europe) and ancient strains of Oriental/North African horses.		The origins of the Lusitano horse date back to at least 25,000 B.C. in the form of its primitive ancestor, the Sorraia breed.
40	Miniature Pony					
41	Miniature Horse					
42	Morgan Horse*					
43	<b><i>Namadgi National Park Brumby</i></b>					
44	New Forest*				Australian Pony Stud Book Society Inc (1931) 103 Copperfield Street	

					P.O. Box 57 Geebung QLD 4034 Ph: (07) 3216 2011 Fax: (07) 3216 2509 <a href="http://www.apsb.asn.au">www.apsb.asn.au</a>	
45	Oldenburger					
46	Percheron*	France			Percheron Horse Breeders Association  Percheron Association Australia Inc.  Secretary / Registrar Ann Pinfold on (02)6385 8344	Percherons generally range between 16 to (very occasionally) 18.2 hands in height. Average height of the Australian Percheron is about 16.1 to 17 hands. Weight is generally in the range of 750 - 1000 kgs. The number of purebreds in Australia is around 350 purebreds, with many crossbreds used for eventing, dressage
47	Palouse*					
48	Palamino					
49	Quarterhorse					
50	Shire*				<i>Shire Horse Breeders of Australia</i> <a href="http://www.shirehorses.info/newsletters.shtml">www.shirehorses.info/newsletters.shtml</a>  <i>East of England Showgrounds</i> <i>Peterborough, PE2 6XE</i> <i>England</i> <i>Ph 001144 1733 234451</i> <i>Fax 001144 1733 370038</i>	Shires, in general, were used in the 16th century with paintings dating back to the 15th century that show them in the perfection of form. Without question, the Shire horse was used as a war-horse.
51	Suffolk Punch (6)*					



52	Swedish Warmblood					
53	Shetland				Australian Pony Stud Book Society Inc (1931) 103 Copperfield Street P.O. Box 57 Geebung QLD 4034 Ph: (07) 3216 2011 Fax: (07) 3216 2509 <a href="http://www.apsb.asn.au">www.apsb.asn.au</a>	
54	Standardbred					
55	Thoroughbred					
56	Tennessee Walking Horse*					
57	Timor pony					
58	Welsh Mountain Pony (Section A,B,C,D)				Australian Pony Stud Book Society Inc (1931) 103 Copperfield Street P.O. Box 57 Geebung QLD 4034 Ph: (07) 3216 2011 Fax: (07) 3216 2509 <a href="http://www.apsb.asn.au">www.apsb.asn.au</a>	
59	Warmblood					
60	Waler*					

#### DONKEY BREEDS EXISTING IN AUSTRALIA

	Australian Donkey*					
	English Donkey					
	Irish Donkey					

## Goats

### Goat Industry Overview

Australia is the world's largest exporter of goat meat and the majority of these exports are derived from feral goat populations. These animals have become locally adapted over the last 200 years of existence in Australia. Specialty meat breeds such as the Boer and Kalahari Red have been introduced into Australia in the last eleven years in an attempt to "improve" the feral breeds' carcass composition. It is hoped by many breeders that the introduction of these new breeds will solve problems encountered by the goat meat industry, such as irregular carcass size, shape, age and general quality.

Goats in Australia are predominantly used for meat which is worth around \$45.7 million FOB. Fibre and milk production are smaller industries and leather is a by-product of the meat industry. About 13 breeds of goat exist in Australia. Three are feral breeds, three are fleece breeds, two are meat breeds, and six are dairy breeds.

Goat meat is the most widely consumed meat in the world and Australia (ranking 46<sup>th</sup> in terms of production) is a relatively small goat producer on a world scale. It is, however, the world's largest exporter of goat meat. In 2001, Australia's farmed goat inventory was approximately 200,000 head. In 2001/02 the Australia goat slaughter was 859,000 head with 138,781 of these being exported. Feral goat populations account for the large proportions of slaughtered goats and are a significant national resource.

America is the largest importer of goat meat from Australia. Taiwan, the Caribbean, Saudi Arabia and Canada are other significant markets.

## BREEDS OF GOATS IN AUSTRALIA

<i>No.</i>	<i>Breed</i>	<i>Developed by &amp;/or country of origin</i>	<i>Imported to Australia</i>	<i>Parent breeds</i>	<i>Breed Society in Australia</i>	<i>Description and Distribution in Australia</i>
	<b><i>Fibre Breeds</i></b>					
1	Angora	Turkey	1832 & 1833 (France)  1873 (South Africa)  1890 (USA)		Mohair Australia Ltd ABRI, University of New England Armidale, NSW 2351 Ph (02) 6773 3557  Coloured Angora Breeders of Australia Ltd. <a href="http://www.mohair.org.au">www.mohair.org.au</a>	Large numbers of Angoras have been graded up in Australia using the Australian Feral goat as a base resource. The breed produces mohair. Staple length of between 120-150mm. They need to be shorn every 6 months. Commercial Angoras today produce yields twice as high Angoras in Australia in the 1870s.
2	Australian Heritage Angora	Turkey	1832 & 1833 from France		Erinrac Enterprises Upper Beaconsfield, Vic. 3808 <a href="mailto:jan@erinrac.com">jan@erinrac.com</a>	Australian Heritage Angoras are a line of registered purebred goats which can be traced directly back to the first Australian registered Angora herd in Australia: the “Banksia” flock, registered with the Goat Breed Society of Australia (GBS) in 1947.
3	Cashmere	1788			Australian Cashmere Growers Association Ltd 30 Cann St. Guilford, NSW 2161 Ph (02) 9632 7476 Fax (02) 9632 5975 <a href="http://www.cashdown.com.au">www.cashdown.com.au</a>	Pure Cashmeres yield as much as 300g per year of cashmere fibre. (Feral goats may only produce 50g per year cashmere fibre).

<i>No.</i>	<i>Breed</i>	<i>Developed by &amp;/or country of origin</i>	<i>Imported to Australia</i>	<i>Parent breeds</i>	<i>Breed Society in Australia</i>	<i>Description and Distribution in Australia</i>
	<b><i>Meat Breeds</i></b>					
4	Boer	South Africa	1993	Descended from nomadic goats of South Africa.	Boer Goat Breeders' Association of Australia (BGBAA) ABRI, University of New England Armidale, NSW 2351 Ph (02) 6773 5177 Fax (03) 6772 1943 <a href="http://www.boergoat.une.edu.au">www.boergoat.une.edu.au</a>	Colours include white with red (sometimes black) head and straight red. The breed has been selected for its meat production
5	Kalahari Red	South Africa	1999		Boer Goat Breeders' Association of Australia (BGBAA) ABRI, University of New England Armidale, NSW 2351 Ph (02) 6773 5177 Fax (03) 6772 1943 <a href="http://www.boergoat.une.edu.au">www.boergoat.une.edu.au</a>	Breed comes in colours, red and black. It is a large- framed meat breed, known as “the feral of South Africa”. It is hardy and it is hoped that the Kalahari Red will add to the productiveness of Australia’s growing goat meat industry.

<i>No.</i>	<i>Breed</i>	<i>Developed by &amp;/or country of origin</i>	<i>Imported to Australia</i>	<i>Parent breeds</i>	<i>Breed Society in Australia</i>	<i>Description and Distribution in Australia</i>
	<b><i>Dairy Breeds</i></b>					
6	Anglo Nubian	Britain	1956-1959	Zairaibi bucks of Egypt and Jumna Pari bucks of India X British does	Anglo Nubian Society of Australia Harveys Rd Carrajung South, Vic. 3844 Ph (03) 5189 1291 <a href="http://home.vicnet.net.au/~goats/ansa/welcome.htm">http://home.vicnet.net.au/~goats/ansa/welcome.htm</a>	Not heavy milk producers, but yield a high average fat yield – usually over 4%, and high protein content. It is a useful dual purpose breed that has a good capacity to adapt to hot climates.
7	British Alpine	Britain	1958	British goats X Alpine goats	Dairy Goat Society of Australia Ltd.	Tall, rangy breed, best suited to cooler climates with low

					PO Box 189 Kiama, NSW 2533 Ph (02) 4232 3333 Fax (02) 4232 3350	humidity. Black colour, with white or cream markings on various body parts. Medium to heavy milk producers. Fat yield usually between 3-4%.
8	Saanen	Saane Valley, Switzerland.	1913 (France & Switzerland)  1930s (England)		Dairy Goat Society of Australia Ltd. PO Box 189 Kiama, NSW 2533 Ph (02) 4232 3333 Fax (02) 4232 3350	Most popular dairy goat in Australia. Heavy milk producers and usually yield between 3-4%fat. Performs best in cooler conditions because of the breed's sensitivity to extreme sunlight.
9	Toggenburg	Obertoggenburg, Switzerland	1947-1953		Dairy Goat Society of Australia Ltd. PO Box 189 Kiama, NSW 2533 Ph (02) 4232 3333 Fax (02) 4232 3350	
<b><u>10</u></b>	<b><u>Australian Melaan</u></b>	<b><u>Australia</u></b>			<b><u>Dairy Goat Society of Australia Ltd.</u></b> <b><u>PO Box 189</u></b> <b><u>Kiama, NSW 2533</u></b> <b><u>Ph (02) 4232 3333</u></b> <b><u>Fax (02) 4232 3350</u></b>	<b><u>The All Black dairy goat was officially recognised as a breed in its own right and named The Australian Melaan at the 2001 Federal Council meeting of the DGSA</u></b>
<b><u>11</u></b>	<b><u>Australian All Brown</u></b>	<b><u>Australia</u></b>				<b><u>Experimental breed in the process of classification in Australia by the DGSA</u></b>

No.	Breed	Developed by &/or country of origin	Imported to Australia	Parent breeds	Breed Society in Australia	Description and Distribution in Australia
	<i>Australian Feral Breeds</i>					
12	<i>Australian Feral Goat</i>	<u>Australia</u>				<u>Commercial production of cashmere fibre began in Australia in the late 1970s using feral goats as foundation animals. Observations at Avondale Research Station, Beverley, revealed that about 70 per cent of the feral goats grew some cashmere. Production ranged from nil to 200 g of cashmere per goat per year. The top 30 per cent of feral does grow 100 g or more annually. In the eastern States the upgrading process has produced fourth and fifth generation goats that grow up to 200 g of cashmere per year. Individual goats have produced up to 450 g per year. (34)</u>
13	<u>Faure Island</u>	<u>Faure, Island, Western Australia. Introduced between 1889 and 1900.</u>		<u>Angora</u>		<u>A feral goat developing in isolation on Faure Island, WA.</u>
14	<u>Bernier Island</u>	<u>Bernier Island, Western Australia, 1899, 1907, 1913.</u>		<u>Dairy goat</u>		<u>Eradicated from Bernier Island in May 1984. It is believed that no more Bernier Island goats exist. (35)</u>

## **Other Breeds of Farm Livestock**

The following sections provide a brief snapshot of other species of domestic farm livestock in Australia that contribute to the nation's farmed-animal genetic diversity. They are relatively minor contributors to agricultural production though many of them are emerging as new "niche" industries.

Only one of the species, the kangaroo, does not technically qualify as domestic farm livestock as it is harvested from the wild. It is included briefly in this chapter because of the increasing demand for harvested kangaroo commodities which currently amount to around 7.7 million tones of meat exports from Australia each year.

### **Alpacas**

Australia imported alpacas in 1989. Alpacas had previously been imported into the country in 1858, but the industry failed and all were lost. In the year 2001 there were approximately 40,000 alpacas in Australia and numbers were increasing rapidly. While the outlook for fibre sales is excellent, the emphasis in this young Australian industry will be on breeding for the foreseeable future.

For more information contact:

The Australian Alpaca Association  
PO Box 1076  
Mitcham North, Vic 3132  
Ph (03) 9873 7700  
Fax (03) 9873 7711  
<http://www.alpaca.asn.au/index.shtml>

### **Buffalo**

"The buffalo industry in Australia is predominately based in the Northern Territory and is still quite small with total numbers just over 40,000. Some meat is exported to South East Asia and 3,084 live buffalo were exported to Brunei, Malaysia and Sarawak in 2001 (Source: NT Buffalo Industry Council)".

There are 2 main breeds of Buffalo in Australia.

- Australian Swamp Buffalo. Introduced to Australia in the 1820s – 1830s from eastern Indonesian islands. At its peak, populations reached around 300,000. The federal and state government's Brucellosis and Tuberculosis Eradication Campaign (BTEC) has decreased populations in the wild to around 30,000 with similar farmed numbers
- Riverine Buffalo. Introduced to Australia in 1994, 1995, 1997.

More information can be sourced from:

The Executive Director,  
Buffalo Industry Council  
Darwin, Northern Territory.

### **Camels**

Camels were first introduced into Australia from the Canary Islands in 1840. Subsequently an estimated 12,000 camels were imported and ultimately released into the wild when road and rail transport replaced the camel as a means of carrying freight. Camels are scattered through the arid interior of Australia with an estimate of 50% in Western Australia, 25% in the Northern Territory, and 25% in western Queensland and northern South Australia.

The Conservation Commission of the Northern Territory detailed aerial survey in 1994 over the southern half of the NT indicated a population of approx. 60,000 camels. The 2001 survey by the Northern Territory Parks & Wildlife Commission has estimated the present feral camel population in the Northern Territory to be in



excess of 200,000. The likely Australian population is now 500,000.

As an alternative to Government controlled culling programs, Central Australian Camel Industry Association Inc (CACIA) has developed markets for trade in live camels and camel meat. The slaughter of camels for human consumption commenced at Alice Springs in the 1980s.

The camels brought into Australia were almost exclusively the one-humped camels (*Camelus dromedarius*) which are found in hot desert areas and are highly suited to the climate in Australia. Only about 20 of the two-humped camels (*Camelus bactrianus*) normally found in cold deserts were imported into Australia.

For more information contact:

Central Australian Camel Industry Association Inc  
PO Box 8760  
Alice Springs, NT, 0871  
Australia  
Phone: (08) 8951 8183 (within Australia)  
Fax: (08) 8951 8188 (within Australia)  
<http://www.camelsaust.com.au/>

## **Crocodiles**

Commercial crocodile farming began in Australia in the 1980s. The main products are skins and meat. High quality handbags, boots, belts, briefcases, and luggage are manufactured from the skins. The Australian saltwater crocodile is reputed to produce the finest quality skin of all crocodilians.

The principal markets for Australian saltwater crocodile skins are Japan, France and to a lesser extent Singapore and Italy. Zimbabwe, Papua New Guinea and Indonesia are Australia's major competitors.

There are two species of crocodiles found in Australia, the saltwater or estuarine crocodile (*Crocodylus porosus*) and freshwater or Johnstone River crocodile (*Crocodylus johnstoni*).

In 2002, there were approximately 68,000 crocodiles on 13 farms. Crocodile meat products include the tail fillet either fresh, frozen or smoked”.

## **Emu**

Commercial emu farming started in Australia in 1987 in Western Australia. The first commercial slaughter of farmed emus occurred in 1990. By 1994, all states of Australia permitted emu farming. Approximately 75,000 chicks were produced in 1994 and around 100,000 chicks in 1995. A market oversupply curtailed further growth.

USA now has the largest population of farmed emus with an estimated population of 1.5 million birds. Europe and Canada have 15-20,000 birds, NZ 2-3,000 birds.

Meat from emus is low in fat and low in cholesterol. Only one species exists in Australia - *Dromaius novaehollandiae*.

## **Kangaroo**

There is no farming of kangaroos in Australia. All kangaroos hunted for commercial use are shot in the wild.

In 2001, 7,685,416 tonnes of quality fresh, chilled and frozen kangaroo cuts and value added products such as smoked fillet and jerky was exported, an increase of 33 per cent on the previous year.

Only five species out of more than 60 species of kangaroo can be harvested. It was estimated in 1997 that the population of the four most common species together numbered more than 50 million.

Over 99% of the commercial kangaroo harvest occurs in the arid grazing rangelands. The harvest is governed by the States' National Parks Authorities and approved by the federal conservation department, Environment Australia. Licensed harvesters are issued with sequenced, plastic lockable tags that are affixed to every kangaroo sent for processing. Every month, the processors must report back to authorities with exact details of the tags they have used, where they were used, species, sex, and weight. In 2002, Environment Australia approved a commercial quota for 6.94 million kangaroos.

## **Llamas**

Llamas are a docile camelid capable of carrying up to 40 kg for 20-30 km a day making them suitable as a pack animal. The llama is used by the native South Americans for its fleece, which is warm and windproof. It is also regarded for its hide, meat and sinew.

In 1858, 283 alpacas and llamas landed in Sydney with the aim of establishing an Australian industry. The plans failed for a variety of reasons. By 1861 there were around 500 llama and alpaca in the colonies. With a change in direction by the Government, the Ledger flock was broken up in 1864 with the animals being sold to a diverse range of interests. None appear to have survived.

Until the early 1980's Chile, along with other South American countries, had maintained an export ban on llama and alpacas. An entrepreneurial spirit among several North Americans, New Zealanders and Australians however, capitalised on a decision by Chile, in defiance of other South American countries, which opposed the move, to allow limited exports of llama and alpaca. They then began to import in commercial quantities from Chile with a high proportion of these animals and their descendants moving to Australia.

Currently there are fewer than 2000 Llamas in Australia.

For more information contact:

The Llama Association of Australia  
Cloverdale Park  
RSD E1328 MaFarlanes Lane  
Mount Egerton, Victoria 3352  
Australia  
Ph 03 5368 9616  
Fax 03 5368 9614

## **Ostrich**

“There are approximately 200 ostrich producers in Australia running 80,000–100,000 birds. There has been a large increase in demand for ostrich meat since the BSE and Foot and Mouth Disease scares in Europe. In 2000-01 Australia exported over 630 tonnes of ostrich meat. In addition, approximately 30,000 ostrich skins (at green skin stage) have been exported for tanning and finishing (Source: Australian Ostrich Association)”.

There are three main breeds of ostrich in Australia: The Masai, (also known as Red Neck), the Somali, (also known as the Blue Neck), and the African Black, (a stable cross between the South African and North African breeds).

For more information, contact:

The Australian Ostrich Association  
45 Settlement Road  
Bellarine Victoria 3223  
Ph (03) 5251 3610  
E-mail: [terry@aoa.asn.au](mailto:terry@aoa.asn.au)  
<http://aoa.asn.au:8080/Menu/index.html>

## Deer

“There are approximately 180,000 deer being farmed in Australia on approximately 1000 farms. Export markets are still being developed, however, some venison goes to countries in the Pacific Rim, Malaysia and the Republic of Korea”. Other commodities include velvet from antlers.

Six species of deer are established in the wild in Australia.

The [Chital \(\*Axis axis\*\)](#) is also known as the Indian Spotted Deer. The Chital was the first species of deer introduced into Australia in the early 1800s by Dr. John Harris, surgeon to the New South Wales Corps and he had about 400 of these animals on his property by 1813. These did not survive and the primary range of the chital is now confined to a few cattle stations in North Queensland near Charters Towers. While some of the stock originated from Sri Lanka (Ceylon), it is likely that the Indian race is also represented.

[Fallow deer \(\*Dama dama\*\)](#) were first introduced into Tasmania prior to 1850 with releases taking place in all of the eastern states of Australia - they are not known to be present in either Western Australia or the Northern Territory, but populations are thriving in all other states. Of more recent times, it is believed that escapes from deer farms, particularly during troubled times within the industry, may have contributed to expansion of the fallow deer range. This is the most numerous breed to be farmed in Australia and is used for velvet and venison production.

[Hog deer \(\*Axis porcinus\*\)](#), were first liberated in Victoria in 1865 and they have established their range in the coastal regions of South and East Gippsland.

[Red deer \(\*Cervus elaphus\*\)](#), were introduced into Australia from Britain in about 1860 (predominantly from Windsor Great Park - a gift from His Royal Highness Prince Albert), releases subsequently took place in all mainland states. The most successful of these releases was in Queensland, however Victoria retains a thriving population in the Grampians National Park and its surrounds. This breed is the second most numerous farmed in Australia and is used for both venison and velvet production.

[Rusa \(\*Cervus timorensis\*\)](#) The original stock of Rusa which reached New South Wales from New Caledonia between 1861 and 1885 was the Javan race - a smaller subspecies, the Moluccan rusa, is located on some of the offshore islands north of the mainland. Liberations were made in New South Wales, Victoria and Western Australia with the surviving population centred around Sydney's Royal National Park and its surroundings. Rusa deer are well suited to tropical areas and are the second most numerous breed in Queensland. The breed is mainly used in venison production.

[Sambar \(\*Cervus unicolor\*\)](#) Sambar were first released in Victoria in 1863 and while the original animals were received from Ceylon (the Ceylon Elk), others were also obtained from India and Malaysia. Following subsequent releases, the sambar has extended its range throughout the Central Highlands of eastern Victoria and into southern New South Wales.

Elk (wapiti) are closely related to Red deer. They are not found in the wild and are only in small numbers in Australia. They are a large breed and are primarily used for velvet production.

For more information contact:

The Deer Industry Association of Australia  
191 Hamilton Highway  
Lismore, Vic 3324  
Ph (03) 5596 2323  
Fax (03) 5596 2313

## RBTA Basis for Defining Rare Breeds

Based on data excerpted from “Status of Rare Breeds of Domestic Farm Livestock in Australia 2004”, an official publication of the Rare Breeds Trust of Australia, compiled by Fiona Chambers, Rare Breeds Trust of Australia (RBTA) Director, June 2004.

The basis for defining the rarity status of breeds of domestic farm livestock has been evolving over the last few years. In the absence of sound data about total breed numbers in Australia, RBTA has used animal registrations as the indicative measure of breed numbers. This assumes that animal registrations are sufficiently indicative of the overall numbers of purebred animals being bred. Currently no registration process exists in Australia for poultry and waterfowl.

In the future, RBTA will be falling into line with other nations around the world to use more specifically the number of (young) breeding females registered as the indicative measure of a breed’s numerical status. The table below outlines the currently recommended measures for determining a breed’s rarity status at the country level.

### UPPER LIMIT OF NUMERICAL CRITERIA FOR THE CATEGORISATION OF FOUR SPECIES OF LIVESTOCK\*

Species	Horses	Cattle	Sheep	Pigs
Category 1	15	25	30	35
Category 2	50	75	100	115
Category 3	150	250	300	350
Category 4	500	750	1000	1165

Source: Criteria for the recognition and prioritisation of breeds of special genetic importance. L Alderson. UK.

\*(expressed as annual registrations of young female stock)

Sources of information used in compiling the appendices.

- (1) Source: Lawrence Alderson, Chairman, Rare Breeds International.
- (2) **Source: Fiona Chambers, Pig Coordinator, Rare Breeds Trust of Australia- Estimates based on APBA herd book figures and word of mouth discussions with breeders. These estimates are subject to further investigation.**
- (3) *The British Saddleback breed of pig was formed by the amalgamation of the Wessex and Essex Saddleback herd books in UK in 1967. Both of these breeds had kept separate herd books from 1918 when the respective breed societies were inaugurated).*
- (4) *PIGBLUP is a PC based genetic evaluation system for pigs. It has been designed to help breeders make the best selection decisions and to control their breeding programs better. (BLUP stands for Best Linear Unbiased Prediction- the most commonly used statistical method of assessing the breeding values of animals)*
- (5) *Source Australian Dairy In Focus 2003.*
- (6) *Canadian Dairy Network Inbreeding Update August 2003.*
- (7) *L. Alderson. Criteria for the recognition and prioritisation of breeds of special genetic importance.*
- (8) *Australian Wool Innovation Limited Woolfacts 2002/03*
- (9) *T Harmsworth & G.Day, Wool & Mohair – Producing Better Natural Fibres Pub. Inkata press.*
- (10) *Ref: Handbook of Australian Livestock, Australian Meat & Livestock Corporation, 2000, 4th Edition*
- (11) *Australia’s Sheep Meat Industry fast facts July 2001. (Meat and Livestock Australia publication)*

- (12) Australian Chicken Meat Federation Inc [http://www.chicken.org.au/meat\\_chicken.html](http://www.chicken.org.au/meat_chicken.html)
- (13) DPI- Layer breeds used in Australia. Ref <http://www.dpi.vic.gov.au/dpi/nrenfa.nsf/FID/-E34949CCE088666CCA256CDF00193648?OpenDocument#Layer%20breeds%20u>
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