

# Deer farming

Bruce Mackay

## Introduction

Although the farming of deer is relatively new in Australia, deer have been farmed commercially in other countries for hundreds of years and there is evidence of deer-farming in China for over 1000 years.

The deer industry was established in Australia in the early 1970s when interest in the farming of deer spread here from New Zealand and its commercial value was recognised. Since then the industry has experienced the fluctuations in prices and interest common to emerging industries and ranging from the initial boom period, when new investors paid high prices for a unique and scarce live animal, to the inevitable crash when the live animal market gave way to a product-based market and prices stabilised as that market became established.

Deer farmers have three potential sources of income:

- a) sale of slaughter stock for venison
- b) sale of velvet antler and other by-products
- c) sale of breeding stock, which in recent years has included export of live deer.

Venison, the meat produced by deer, is a very lean meat. It also tends to be low in saturated fats and relatively high in essential fatty acids, making it a healthy product. Venison is often promoted as 'the healthy alternative' and it has good prospects for sales in the health food market.

Velvet antler is the complete antler harvested from male deer at a precise stage when it is soft and vascular before it calcifies and hardens. All male deer grow and shed their antlers in an annual cycle. While not all species of deer farmed in Australia are used for velvet purposes, all deer must have their antlers removed to ensure safety and ease of management.

Velvet antler is a highly prized substance in the practice of oriental medicine and it is also being increasingly used in western communities. Recent research by Professor Peter Ghosh at Royal North Shore Hospital has demonstrated the value of powdered deer velvet to ameliorate adjuvant and rheumatoid arthritis. Further research on this is now being undertaken.

Low labour requirements and the natural beauty of deer make them an attractive proposition for first time farmers as well as for traditional farmers to diversify into a new livestock industry.

## Key statistics

Deer numbers in Australia

## Markets and marketing issues

There are domestic and export markets for venison and export offers the best returns. Over 80% of Australian-produced venison is now exported, mostly to Asia.

The major world market for venison has traditionally been Germany where it is prized as game meat. Around 40–50,000 t of venison are consumed in Germany annually including about 5,000 t from New Zealand.

Other major markets for farmed venison lie in the European Union, Scandinavia, Switzerland and the USA. These tend to be traditional ‘game’ meat markets where consumers gladly accept meats such as venison. They are large markets with limited Australian market penetration because of the current small size of our industry and our inability to provide the volume required. Several Australian venison processors are now developing these European markets and this trade is expected to go on expanding.

Exports of Australian product have been aimed principally at Pacific rim countries. These are difficult, non-traditional venison markets but the low-volume orders can be readily met by Australian suppliers. Australian venison is now selling successfully, particularly in Korea and Malaysia, with a

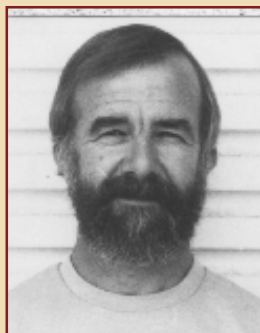
Venison production in Australia

large proportion of product meeting Halal kill-specifications. Most export product comes from NSW which, unlike other states, has export-accredited slaughter facilities for deer.

Australia’s major competitor on the world market is New Zealand which farms around 1.2 million deer. Other countries have small but developing deer industries and are not likely to pose any major threat in the short to medium term

Venison animals are slaughtered at 15 to 24 months of age with carcass weights ranging from 28 kg for fallow up to 55 kg for red deer and higher for wapiti hybrids. Slaughter for human consumption must take place at registered abattoirs where the animals undergo normal rigorous meat-inspection procedures.

## About the author



Bruce Mackay is an honours graduate from Hawkesbury Agricultural College and is employed by NSW Agriculture as a District Livestock Officer. He has been located at Orange in the central west of NSW as District Beef Cattle Adviser since 1972.

Bruce's interest in deer is a personal one and dates back to 1976 when he attended a very early deer industry day conducted at Orange. He maintained an interest in the industry until 1983 when he was officially appointed as the Department's officer responsible for deer farming across NSW. Since that time he has worked closely with the industry and was appointed a life member of the NSW Deer Farmers' Association in recognition of his services in 1991. He has written numerous articles on deer farming and has studied the deer industries in New Zealand and China. See Key contacts for address.



Yearling red deer (spikers) in central NSW

An estimated 20,000 head will be slaughtered nationally for the year ended 30 June 1997 compared to 34,000 in 1996 and 30,000 in 1995, which highlights the concern that there are not enough deer in Australia to meet market demands. Returns to producers for venison have varied markedly in recent years, but carcasses meeting optimum specifications have been returning up to \$2.70/kg live weight or more.

Velvet is frozen on farm after harvest and is sold either through the industry-run velvet pools or direct to Asian buyers.

Traditionally, the velvet market has been volatile but in recent years prices have been relatively stable at around \$120/kg for top grades. Good quality mature red stags can yield up to 3 kg or more.

Most Australian-produced velvet is processed and used locally, but the major world markets for velvet are China, Korea, Hong Kong, Taiwan and Singapore.

Other products from the deer industry include skins, tails, pizzles, sinews, and blood.

Although there is a market for these products, its development is restricted by the small volume of supply.

## Production requirements

Deer are very adaptable and, with careful selection of species, can be run in most parts of Australia. However, they are mainly being farmed on better-quality grazing since they thrive on good quality pasture. Access to irrigation is an advantage, particularly to ensure that adequate turn-off weights are achieved. Most pasture species considered adequate for sheep and cattle are suitable for deer. Steep country that is difficult to fence and muster and country traversed by water courses should be avoided. It is also important to provide shade in summer and protection in winter, particularly for fawns. Access to slaughter facilities and markets can also be an important consideration in locating a deer farm.



Red deer stag in South Australia

Stocking rates for deer will depend on the quality of the country and will vary with the time of year, but as a guide one beef-breeding cow is equivalent to four red deer or eight fallow deer.

Deer generally require specialised fencing and handling facilities as they are very agile and can readily jump 2 m or higher. Some States have specific requirements for boundary fencing which can be up to 2.1 m high but where no regulations are in force, boundary fences should be high enough to prevent the escape of deer and of the best affordable quality. A range of materials is available for deer fences including specially constructed deer-netting in various specifications.

Farm layout and design are important to the workability of a deer farm and the ease of stock management. The most practical way to move deer is along laneways. Ideally, all paddocks will be connected to a laneway

system that allows ready movement of deer from paddock to paddock and to the handling yards.

The main working area of deer yards is generally under cover as deer are easier to handle in subdued lighting. Yards need not be elaborate but do need to allow for such practices as drafting, vaccination, weighing, de-antlering and loading. Commercial crushes are readily available that assist with the handling of deer.

## Breeds of deer

There are many species of deer in Australia but not all of them are suited to large-scale farming. Six species that can be classified into tropical and temperate species are farmed commercially.

Tropical species:

Rusa – *Cervus timorensis rusa* (Javan), *Cervus timorensis moluccensis* (Moluccan)

Chital – *Axis axis*

Temperate species:

Fallow – *Dama dama dama* (European) and *Dama dama mesopotamica* (Mesopotamian)

Red – *Cervus elaphus*

Wapiti – *Cervus canadensis*

Sambar – *Cervus unicolor*

The choice of which species to farm will generally depend on climate, personal preference and market for products, but availability and price also needs to be taken into account. The number of farmed deer in Australia is estimated at 160,000 head, comprising 40% Red deer, 50% Fallow and 10% other species. Red deer, which have heavier carcass weights, are estimated to make up closer to 60% of venison production. Red deer have shown the greatest increase in numbers in recent years thanks to their versatility, production potential and suitability for farming.

## Key messages

- E Deer farming is now a well established industry in Australasia
- E Deer farming is a product-focused industry
- E There are well-established international markets for all deer products
- E Markets for deer products exceed supply
- E Deer farming offers diversification opportunities for existing farmers as well as new farmers

The temperate species are of European origin and adapt readily to the Australian climate. They have a well-defined breeding season with the mating season generally beginning in early April and lasting around four to six weeks. Fawns are born largely in December and January.

Tropical species are less seasonal in their breeding habits and are more suited to the warmer parts of Australia

Some hybrids are now being used commercially to gain production advantages from hybrid vigour (heterosis) and additive genetic effects. The main crosses being used are European  $\times$  Mesopotamian Fallow and Red  $\times$  Wapiti. While Sambar and Rusa will cross-breed, commercial use of this hybrid is limited. Other species do not naturally hybridise.

Terminology used for the sexes of different species of deer

mustered and yarded pays dividends. However, the deer farmer needs plenty of patience, to be a good observer and have an understanding of animal psychology. Regular supplementary feeding can be a useful aid to keeping deer quiet and easily handled. Deer can be readily worked with dogs but it is essential that they are not rushed or crowded but allowed plenty of time to find gateways and to move up the laneways into the yards.

While the temperate species have a distinct seasonal breeding pattern, controlled joining greatly assists in the management of the tropical species. The mating season of the temperate species (called the rut) generally begins in late March and females are normally left with the males for a period of 8 weeks. Males can become quite aggressive during the rut and it is advisable not to handle deer at this time.

The first fawns are produced in late November and if males are removed after 8 weeks, fawning will be completed by late January. Both males and females can be

bred at 16 months of age with females known to breed until they are at least 16 years old.

During the mating period, males eat very little and depend on body reserves for survival. Following the rut and for the remainder of the winter, feed intake remains virtually at maintenance levels even with high-quality diets and abundant pasture. This means that pre-rut feeding management of breeding males is of critical importance to ensure that males are able to survive the winter. This feed intake pattern is also evident in females but to a far lesser extent.

Nutrition of lactating females is also important as often summer feed may be of poor quality and may need supplementing.

Castration is not widely practised in the deer industry, mainly because of the lower weight gains of castrates. However, there are some marketing advantages in castrates: they can be slaughtered all year round; the problem of aggression is overcome; and meat quality does not change because of the rut.

## Deer husbandry

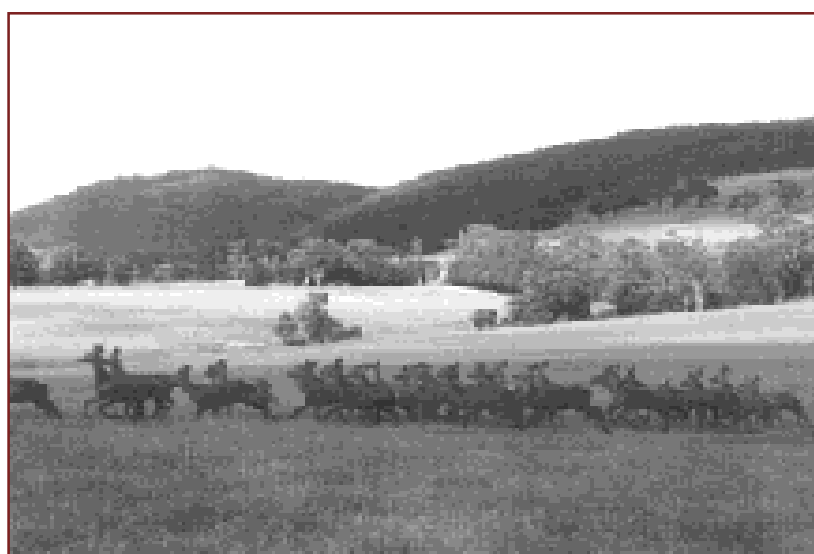
Farm-bred deer can be readily handled but cannot be regarded as fully domesticated and basic stock handling skills are a prerequisite. Deer are very intelligent and are generally predictable in their behaviour. They are easy to train and education at a young age to accustom them to being



Australia now farms over 200,000 deer

## Deer weights and sizes

Species	Males		Females		Birth weight
	Weight (kg)	Shoulderheight (cm)	Weight (kg)	Shoulderheight (cm)	Weight (kg)
Red	180–300	130	90–120	90	8–9
Wapiti	350–450	150	230–250	125	9–11
Rusa					
Javan	120–160	100–110	70–85	90	4–5
Moluccan	80–100	95	50–60	85	4–5
Fallow	75–100	90	42–50	76	4.5
Sambar	180–300	127	150–200	115	5–6
Chital	70–90	90	40–50	80	3.5



Red deer and good pastures—a good recipe for profit

Velvet antler production is a specialised operation requiring good husbandry and a knowledge of animal physiology, genetics and nutrition along with an appreciation of harvesting skills and post-harvest care. Generally the best markets are for velvet from red, wapiti and their hybrids, although markets do exist for velvet from other species. Timing of velvet harvest is critical to maximise velvet yield and to ensure that velvet is of high quality. Velvet can only be removed by qualified veterinarians or farmers who have undergone specialised

training and are accredited to velvet their own deer.

### Pest and disease control

Deer are very hardy animals and relatively free of pest and disease problems. Most problems associated with deer are the result of stress, either nutritional, climatic or from handling and well managed deer suffer from very few health problems. However it is recommended that they be vaccinated against clostridial diseases annually.

## Processing

The processing of deer at abattoirs and the subsequent boning and packing of venison are generally restricted to general abattoirs designed for slaughter of other species. While this operates reasonably well with only minor modifications required, many abattoirs remain reluctant to take on the slaughter of deer. This is due partly to the relatively small numbers and intermittent supply of deer available for slaughter and the sensitivity of export abattoirs to any situation that could jeopardise their export consideration. At least one specialist deer-processing plant with export accreditation will commence production in 1997 which will further improve market access.

Velvet processing plants have been established in NSW and Western Australia. The pharmaceutical standard velvet processing plant at Goulburn in NSW has been in operation for a number of years producing a range of deer-based products which are sold commercially across Australia. Velvet

processing generally involves cooking at high temperatures, often in a steam bath, then drying to remove moisture. This product can then be sold in sliced or powdered form in capsules. The active ingredient of velvet, called Pantocrin, can also be extracted for use in tonics.

## Economics of production

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Anyone considering entering the deer industry should look carefully at the economics of the industry and develop their own budgets without reliance on any one source of information. Gross margins are a first step in making comparisons between industries but they are not a measure of profitability—they merely show the difference between the gross income earned by the enterprise and the variable costs associated with it. They do not consider overheads.

Capital costs for land and for setting up a deer enterprise will vary widely with location and the scale of the operation. The following costs can be used as a guide:

Gross margins based on returns for venison of \$4.00/kg carcass weight (\$2.20/kg live weight) are:

## Key contacts

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Deer Industry Association of Australia  
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Australian Fallow Deer Network  
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Australian Warnham and Woburn  
Society  
P.O. Box 58  
Yarragon, Vic. 3823  
Phone: (03) 5634 2341

NSW Agriculture  
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Orange Agricultural Institute  
Forest Road  
Orange, NSW 2800

Phone: (02) 6391 3968  
Fax: (02) 6391 3899

Queensland Department of  
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Deer Industry Development  
Officer  
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Australian Venison Processors  
Association  
Tony Berry  
Executive Director  
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Cowra, NSW 2351  
Phone: (02) 6341 1302  
Fax: (02) 6341 1107

## Key references

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*Australian Deer Farming Manual*  
produced by and available from  
Red Deer Society of Australia

*Deer Farming in NSW*  
A manual compiled by and  
available from Bruce Mackay,  
NSW Agriculture

*Australian Deer Farming Magazine*  
Available on subscription from A.  
Cowan, Maroonah Highway,  
Buxton Vic. 3711

Most Deer Industry Association  
of Australia State branches also  
have available a range of  
reference material.

## Rockley Deer Park— integrating production and processing

In 1989, Sydney businessman Rod Maclure acquired a sheep-grazing property at Rockley in the central highlands of New South Wales and proceeded to develop a commercial red deer farming enterprise. At that time in Australia it was difficult to obtain lines of quality red deer at reasonable prices, so it was decided to import the initial breeding stock of 135 hinds and a few excellent stags from New Zealand.

The development of the deer farm was carried out progressively to a master plan developed by the Rockley deer farm manager, Mr Russell Dawson. Russell is a New Zealander with around 25 years experience in the industry.

The master plan for the development of Rockley Deer Park has been completed, with more than 25 km of deer fencing, excellent yards and handling facilities, including a hydraulically operated crush with scales.

Within the first seven years the deer farm reached its optimum stocking rate of around 1,000 breeding hinds and 150 velveters. For short periods numbers reach up to 2,500 red deer.

The velveted herd includes some excellent sire stags and other stags which have been hand selected over the years.

The age of the herd ranges from some spikers to mature stags. The velvet yield averages more than 3.0 kg/head and over the years has produced very lucrative returns for the deer farm. However, the highest revenue has come from selling livestock and deer for slaughter to produce venison.

In the early 1990s, Rod Maclure began slaughtering deer for venison to supply the domestic market. This was mainly for the hotel/restaurant trade in Sydney. Realising the limitation of the domestic market, he recently began exporting venison to Asia and Europe. Deer were slaughtered at a large multi-species abattoirs and processed in non specialised boning rooms.

There were always problems associated with processing venison in non dedicated works and it was difficult to obtain a consistent quality product.

When the opportunity arose to purchase a small domestic abattoir at Oberon, just 30 minutes from Rockley Deer Park, Rod Maclure bought the plant with the intention of redeveloping it as a specialised deer slaughter facility with full export registration. Before commencing the project, a number of deer slaughter plants were visited in New Zealand and some of the best features from the various plants were incorporated in the plans for the Oberon deer slaughter plant and the boning room.

The deer slaughter plant has now been completed and incorporates many specialised features using state-of-the-art technology. The yards (lairage) have been built to very hygienic standards and to minimise stress and bruising. The knocking box/restrainer is pneumatically operated and is unique.

In the slaughter room the deer are electrically stimulated, using a specially designed low-voltage stimulator. This ensures that the venison is tender and does not get tough through cold shortening. The carcasses are dressed using a pneumatically operated inverted dressing rig. Inverted dressing is regarded as the most hygienic method.

This project is the only one of its kind in Australia at present and represents a substantial investment in the future of the deer industry. Rod Maclure has demonstrated his confidence in the industry and hopes that the new deer slaughter premises will be the catalyst for continuing strong growth by the expansion of existing deer farmers and from the entry of new deer farmers into the industry.

