

**TECHNICAL BULLETIN
NO. 27**

**PROSPECTS OF DEER
FARMING IN THE
NORTHERN TERRITORY**

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NORTHERN TERRITORY

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NT Government

July 1979

CONTENTS	Page
INTRODUCTION	1
LEGISLATION	5
STOCK — Breeds Available	7
— Supplies	8
SECURITY AND MANAGEMENT	13
HEALTH	15
FEEDING	16
PROCESSING AND MARKETING	17
ECONOMICS — Returns	19
— Inputs	20
CONCLUSIONS	21

INTRODUCTION

Deer (Cervus spp) are established in the wild in New Zealand and Australia, with many species having been introduced since European settlement.

Deer products enjoy a very heavy demand in many parts of the world due to the diverse range of goods produced from them.

As deer in the wild in New Zealand became scarce, so deer farming began to flourish. In recent years, as prices for deer products soared, the numbers of farmed deer have risen dramatically. In New Zealand a population of 30,000 farmed deer had been established in the ten years to 1978, and numbers are still rising rapidly.

In Australia the present population of farmed deer is between 5,000 and 6,000. Prices for breeding stock are very high and importation from other countries, including New Zealand, is banned. In the last two to three years there has been increasing interest in the deer industry throughout Australia, due to the high potential value of the animal. Greatest numbers of farmed deer are in Victoria and New South Wales, with smaller herds in South Australia and Queensland

All these States have populations of wild deer, with large numbers in Tasmania as well.

In 1978 the Animal Production Committee of Standing Committee on Agriculture established a Deer Working Party to study commercial deer farming in Australia and to make appropriate recommendations to Government.

This report studies the technical, financial and legislative aspects involved in determining whether deer production in the Northern Territory could become a sound, viable, long term industry.

The Northern Territory has two populations of wild deer. These are in isolated areas and numbers are comparatively small. There is some local interest in starting a new deer industry mainly due to the presence of the wild populations and the hope that capture from these herds would be practical and financially feasible.

The considerations that must be made before an industry is developed include -

- Legislation and industry regulation
- Stock - breeds and supply
- Security and management
- Animal health requirements
- Feeding
- Processing and marketing
- Economics

1. Legislation

Most States have legislation which specifically relates to deer farming, and rigid controls are enforced. As a general rule, deer farming is restricted to those areas which already have existing wild populations nearby, so the risk of creating new populations in previously free areas is small.

Victorian and New Zealand legislation allows complete regulation of deer populations by licensing farms.

In Victoria separate licences are issued for numbers less than 25 or greater than 25 (private deer or commercial deer farms respectively). Applicants for licences must show plans of the proposed enterprise and must comply

with a list of pre-requisites before licences are issued. Security of fencing is particularly covered, with minimum specifications for design.

However there are moves to relax restrictions in New Zealand and there is considerable pressure to do likewise in Victoria. It is felt that present regulations are unnecessarily restrictive.

The Northern Territory does not have any legislation which specifically relates to deer farming. Sambar deer are found in the Northern Territory on Cobourg Peninsula, and Rusa occur on North East Isle (off Groote Eylandt). These two populations are legislatively protected by virtue of the fact that the two areas are Sanctuaries or Reserves. In the Territory Parks and Wildlife Conservation Act, deer are not mentioned specifically at present. However, under this Act they could be declared to be wildlife and would then be subject to import/export control and possession for any purpose could be regulated.

If it was decided that deer farming should be undertaken in the NT, then covering legislation should be introduced, based on the survey of the States legislation being undertaken by the SCA - APC Deer Working Party. It may also be necessary and desirable to amend other Territory Acts to cater for deer production. For instance, deer should be declared "stock" under Acts concerned with stock movements and disease, brands, slaughtering and meat inspection.

2. Stock - Species and Supplies

a) Breeds available

Six breeds occur in Australia in the wild. These are Red, Fallow, Hog, Chital, Rusa and Sambar deer. At present only three or perhaps four of these are regarded as farming species. They are Red, Fallow, Rusa and perhaps Chital. Hog deer are extremely small, totally unsuitable for farming and geographically isolated in one area of Victoria.

Red, Fallow and Rusa are the most commonly used species in farming and their temperament is much more suitable.

Rusa and Sambar are the only species which are likely to survive and be productive in the Top End of the Northern Territory due to their Asian origin. This is borne out by the fact that several other species have been released but have not survived in the Northern Territory.

Sambar deer are widespread in Victoria but have never been used as farmed species to any extent. (There are only ten at present in farming situations). This is mainly due to difficulty of procurement and the non-issue of permits for their capture. They are non-gregarious by nature and they present some handling problems. Sambar are found only in stag-hind pairs, or one stag with a small number of hinds and offspring. Male Sambar are particularly aggressive when territories are infringed during the mating period. This makes them unsuitable for close-fenced situations with numbers of males during this period. Castration stops any further antler growth, so is not a useful method of making males less aggressive, due to the value of antler velvet.

Captivity is known to cause stress in Sambar and large losses are likely to result. It is stressed that there is very little known of the Sambar in captivity and most of the above is based on the species in the wild. There is a herd at Werribee Park (Annexe of Melbourne Zoo) and these animals are just as quiet as a similar herd of Red deer.

The most desirable species which could then be considered as a commercial proposition is Rusa which is a smaller species (males average 100 kg, females 80 kg) than the Sambar (180 kg average male up to 270 kg, and females 130 kg). Rusa are much more easily handled, are less nervous, respond to continual handling, and aggression and dangerous actions are rare (except for males during the mating period). Rusa are a common species on some Victorian and NSW farms but they are not particularly well adapted to harsh cold winter conditions.

The Sambar has a possible use in cross-breeding with Rusa to produce a larger animal. Fertility of the progeny of this cross is, as yet, unknown. This crossing is likely to improve the antler value compared with that of the Rusa.

b) Supplies of breeding stock

On Cobourg Peninsula, Sambar are widespread in low numbers, and tend to be rainforest - mangrove fringe dwellers.

Capture would prove extremely difficult and costly and only very small numbers would be possible over lengthy time periods. The Sambar are a hunter's prize

because they are large, cunning and particularly elusive. The most likely capture method would involve tranquilliser drugs and this is an extremely skilled operation requiring experienced operators. The hindquarter is the only safe target area which would make darting a rare feat. Over-dosing is a hazard and to achieve any success in finding the animal (due to their speed and hiding ability) darts would need to incorporate a radio tracking system. Information on the use of tranquillisers for deer would have to be sought from interstate or New Zealand.

Once captured, the problems of sedation, transport out of the area and holding for any length of time would be great. When put in a new area, deer tend to become panicky and can still do considerable damage.

Trapping is a possible means of capture, but stress problems can occur especially when the animals are approached by humans. This technique is used quite widely in southern States and few losses are reported.

Helicopters are used extensively in New Zealand for capture but due to markedly different conditions are unlikely to be successful on Cobourg Peninsula except for transporting sedated animals away from in-accessible areas. They may be a means of capture on North East Isle where the country is more open.

Cobourg Peninsula is for the most part inaccessible by vehicle, particularly where deer are more common, and therefore movement is very restricted. The whole catching operation would be difficult, would require experienced operators and would probably be extremely expensive per animal which survived to the farm area.

SAMBAR STAG AND HIND



YOUNG SAMBAR HIND

MATURE SAMBAR HIND



**RUSA STAG, HINDS
AND CALF**



HERD OF RUSA

HAND REARED RUSA CALF



Full time veterinary assistance would be required during the entire operation.

In New Zealand, capture costs an average of \$200 per animal. This relies on being able to shoot and track the deer by helicopter until the drug takes effect. This would be extremely difficult on Cobourg Peninsula.

The Board of Enquiry into feral animals in the Northern Territory recommended (p 49) that a small breeding herd of Sambar deer be caught and relocated (under strict control) on a Research Station in the Top End, to ensure that a nucleus group is available for future use in deer farming and tourism.

Capture of Rusa from North East Isle may be more practical with an experienced operator given the difference in terrain and species, and the presence of an airstrip and suitable barge landings. However there may be problems of ownership, as they are on Aboriginal land. Transportation of captured Rusa from North East Isle would be difficult and expensive.

Territory Parks and Wildlife Commission would be happy to see all deer removed from North East Isle to avoid the possibility of the species establishing in East Arnhem Land either by people-assisted translocation, or by a remote chance that the animals may decide to swim.

The Feral Animal Report (p 49) recommends relocation of the deer from North East Isle from both an environmental and quarantine point of view. A small herd could be established on a Research Station, in a similar

way to Sambar, to preserve the genotype and for study of the possibility of commercial deer farming in the Northern Territory. Other animals could be released as breeding stock for commercial production.

Supplies from other States could be arranged at present for Rusa breeding stock only, but as demand is very high, prices are also high. The present market price for a breeding pair of Rusa is around \$1,600.

Permits for capture of Sambar in Victoria are still not being issued. This is the only other source of Sambar in the wild in Australia apart from the Snowy Mountains.

3. Security and Management

Deer are said never to become truly domesticated, even though attempts have been made over many centuries. They require extremely careful management and expert handling.

Secure fencing is necessary for deer due to their nervous nature and jumping ability, particularly with animals recently captured from the wild. It is in the farmer's interest to ensure that there is no loss of valuable stock. There are environments available in the Northern Territory, particularly in the coastal areas, which could favour the establishment of feral herds, should animals escape. Feral herds of Rusa deer have established and thrived in Papua New Guinea in environments very similar to the Top End of the Northern Territory.

It appears that the Territory Parks and Wildlife Commission would regard deer farming favourably if there was absolute security in boundary fencing. The Feral Animal Report (p 149) suggests that if conditions of security could be met, there is no reason why the Government should discourage commercial deer farming.

The Northern Territory is unique in Australia in that commercial farms, if set up, would be in deer free areas, whereas in the States they are in wild deer areas. A more secure boundary fence design than that required in Southern States should therefore be specified for any Territory deer farms. An extremely secure (but expensive) boundary fence would consist of steel or wooden posts 4m in length with 3m above ground level, spaced at 5m maximum. Chain mesh 2.44m in width would be suspended on four horizontal heavy plain wires 0.8m apart, with three light gauge high tensile wires 0.2m apart above the chain mesh. Internal fences could be slightly lighter. The mesh needs to be buried 150mm in the ground. Barbed wire is never recommended because of possible damage to valuable stock.

Buffalo, pigs, feral cattle and horses could damage fences and this is a reason for heavy duty construction. In addition, risks to fences from bushfires, flooding and falling trees would have to be minimised.

Electric fences may prove useful in managing stock which are more quiet. They may be extremely useful in protecting external fences from damage by local feral animals.

Yards are a necessity in well managed deer farms for husbandry, disease and parasite control. However their construction is expensive according to New Zealand

experience. Yards have solid, high walls and light is considerably reduced. Deer are successfully handled at night by torch light.

Darkness acts as a sedative to deer and is used extensively when they are being handled and transported. Drugs are used extensively in deer handling.

Deer are unusually attractive to the shooter, so they are best located away from sight of the public but in full view of the farmer. The risk of theft is also high due to the value of the animal. A stag in full antler is usually the most prized target even if the antlers cannot be retrieved.

4. Animal Health Considerations

Deer are known to be susceptible to brucellosis, tuberculosis, leptospirosis, salmonellosis, Johne's disease and enterotoxaemia, although most of these have not been found in deer in Australia. Feral herds in the Northern Territory could act as reservoirs of diseases exotic to Australia, should they be introduced.

Large numbers of livestock concentrated in confined areas encourage a buildup of internal and external parasites, and deer are no exception. Drenching is often necessary on some farms, particularly for young stock.

Deer are also susceptible to ticks, so similar movement restrictions would be necessary as exist with cattle. Dipping and pasture spelling may be necessary management tools in keeping ticks at low levels.

Elaphostrongylus cervi, an internal parasite, is the reason why New Zealand deer are banned at present from importation into Australia. This parasite has not been found in the small number of deer so far tested in Australia.

Immobilising drugs are used extensively in deer management and some control may need to be placed on their use, particularly in regard to residues in venison. Most are restricted at present to use by Veterinary Practitioners.

Regulations governing the methods of transport used may be necessary from the animal health viewpoint, but it is in the interest of the producer to ensure that valuable animals are given proper care to protect his investment.

Darkness in the transporting vehicle, and the use of drugs, considerably reduces deaths from stress.

Deaths due to stress are common in deer. Over-exertion results in heavy adrenalin secretion. This causes depletion of muscle energy, allowing a rapid buildup of lactic acid which can cause death.

5. Feeding

The productivity of deer appears to be directly related to the quality of the available feed and because the products have very high value, there is scope for considerable expenditure on improving the quality of feed offered.

Improved pastures and fertiliser or heavy hand-feeding would be necessary. Hay is apparently not usually

accepted unless of extremely high quality. Species proven in the Top End, such as Pangola grass, would probably be suitable.

Irrigation could also be contemplated, especially during the dry season. Irrigation would be necessary in areas other than the Top End.

Conservatively a stocking rate of one Rusa deer per 0.5 of a hectare with minimum fertiliser could be expected. Increased fertiliser use and irrigation would reduce the area required.

For hand-feeding, the most commonly used feedstuffs are pellets or cubes of a grain such as oats and high quality lucerne chaff. A certain amount of this type of feeding would probably be necessary during part of the year to keep production levels high.

Ironwood and other poisonous trees and shrubs would need to be eliminated from the area, especially if deer were brought from interstate.

6. Processing and Marketing

Abattoir regulations may need to be revised to take account of venison processing. There are special problems in processing deer due to their nervous nature and problems of transportation.

Deer can be sold as breeding stock or used for venison, antler velvet or various by-products. Deer products (venison and velvet) tend to increase in demand with rising affluence.

Venison and breeding stock are the most likely markets for a Northern Territory industry in the short term unless a Velvet Pool is established by a national deer body.

Overseas markets for venison from the Northern Territory could possibly be established which could compete favourably with southern produced deer. These could include the tourist trade in such places as Singapore or Malaysia, but these markets would need to be assessed.

There would presumably be some local demand for venison from the restaurant trade but this would not be large.

There could possibly be some breeder trade if Sambar were a farming proposition and if restrictions on capture in Victoria remained in force. It would appear that hunter lobbying is the reason for lack of permits to capture Sambar there. The populations in the wild in Victoria are very large compared with the NT.

Antler velvet removal is a specialised skilful operation, which requires the use of tranquilliser drugs. Hong Kong, Japan, Korea, Malaysia and Singapore have shown interest in buying velvet in Australia and demand and prices appear to be increasing rapidly.

7. Economics

The economic feasibility of deer production is difficult to assess as productivity levels are unknown for the Northern Territory environment. It would be necessary to conduct at least a five year productivity investigation to obtain the data necessary for even a basic economic assessment. Such data would include growth and reproductive

rates, breed comparisons, stocking rates, disease states, suitable pasture species, weight of antler growth, carcass characteristics and management requirements.

The figures which are quoted below can be used only as a rough guide to the costs and returns which could be expected.

a) Likely Returns

i) Velvet Returns depend on the species farmed.

A Rusa stag will produce 1 - 1.5 kg velvet/year, which at present value is worth between \$200 and \$400 per annum. The yield of velvet from Red and Sambar deer is greater than that from Rusa, but recent evidence suggests that Rusa velvet is more valuable than Red deer velvet.

ii) Venison is worth approximately \$5/kg at present and Rusa stags produce approximately 52 kg carcass weight at maturity, ie \$260/head. Hinds produce an average of 44 kg at maturity, ie \$220/head. However velvet provides by far the most lucrative returns at present.

iii) By-products In New Zealand, the present value of by-products is as follows :

Sex	Percentage of total value of animal		By-product Value (\$)
	Venison	By-product	
Stags	53	47*	230
Hinds	88	12	30

* Includes velvet. (These figures are rapidly becoming outdated due to changing value for velvet).

iv) Breeding stock in Australia at present bring around \$1,600 per breeding pair of Rusa.

b) Capital inputs

The input required would depend on which assets (eg water supply; improved pasture) could be diverted to the deer enterprise. Setting up entirely from the beginning would require :

i) Land - relatively inexpensive per hectare.

ii) Pasture improvement As an example, the cost of improvement with Pangola grass would be approximately \$120/ha with minimum fertiliser.

iii) Fencing The boundary fence design required for maximum security could be built completely from steel at a cost of \$10,400/km for materials, with contract erection causing approximately \$5 - 10,000/km extra. The use of local timber for posts may reduce the costs of materials.

The following are examples of costs for fencing various sized paddocks using the above design.

Rusa Population	Paddock Size	Total Cost of Materials	Cost of Fencing per ha
150	80 ha	\$37,476	\$468
75	40	\$27,066	\$676
15	8	\$12,492	\$1,561

Internal fencing would be necessary and desirable for efficient handling of deer and pasture. Materials for this would cost approximately \$6,500/km.

iv) Watering Drilling, casing and equipping one bore would cost \$5 - 10,000 depending on the depth. For irrigation capacity, costs would be much greater.

v) Yards Approximately \$4,000 - \$6,000 erected.

vi) Annual running costs are likely to include the labour required for feeding, drenching, velveting, fertiliser application and fence repairs and maintenance. Almost constant supervision is required, particularly at calving time to reduce the number of deaths.

These costs are difficult to predict at this stage without previous knowledge of how deer will produce in this environment.

CONCLUSIONS

1. Of the six deer species at present in Australia, Sambar and Rusa are considered to be the only two suited to Northern Territory conditions. Both these species occur in feral herds in the Territory.
2. Little is known on the Sambar breed at present and it is possible that it may not be a particularly suitable species for farming. Capture of breeding stock from the feral herd on Cobourg Peninsula would be both very difficult and very expensive.
3. Rusa are suitable for farming but there may be some problems in obtaining breeding stock from the feral herd on North East Isle. Rusa stock may have to be imported to the Territory (at great cost) from southern States if local deer farming were started on anything but a small scale.

4. Deer farming is not covered by current Northern Territory legislation as it is in some States. Appropriate legislation, covering such aspects as importation, registration of farms, transportation, fencing, meat production and disease, would need to be introduced before deer farming was commenced in the Northern Territory. The type of legislation required will be determined by the current SCA - APC Working Party on deer production.

5. The risk of uncontrolled deer populations forming (particularly in the coastal areas) appears very high if escape of farmed animals were to occur, although opinions vary on this possibility.

6. The risk of escape may be greater than in the southern States due to pressure on fences from a larger feral animal population (buffaloes, pigs, horses), natural disasters (flood, fires, cyclones) and the less settled nature of the land.

7. The development of feral herds could not be tolerated from the point of view of animal health and environmental safety. Deer farming mostly occurs in southern states where feral populations already exist.

8. Research on the productivity and management requirements of deer under Northern Territory conditions is required before the potential profitability of a local industry can be properly assessed. Although high initial capital investment in fencing and stock is required, present markets for deer breeding stock, venison and antler velvet are lucrative and the longer term market prospects for these products appear to be good.