Processing of Deer and Other Farmed Game

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for Gamekeepers of Australia Pty Ltd
and Rural Industries
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EXECUTIVE SUMMARY

This report on the processing of deer and other farmed game has been prepared for Gamekeepers of Australia Pty Ltd. It covers the processing demand for farmed game and the capital and operating costs of an integrated processing plant including slaughtering, boning and smallgoods production. The work was funded in part by the Rural Industries Research and Development Corporation.

Deer farming has been practised in Australia for about 15 years. The size of the herd is not accurately known but is estimated to be about 190,000 head. Venison is processed in commercial abattoirs around the country but there are presently no dedicated works for deer. The value of deer has dropped from the high prices for breeding stock which previously prevailed . There are estimated to be between 15,000 and 30,000 head available for processing each year.

The economics of a dedicated deer or farmed game processing works would be enhanced by collecting co-products worth about $35 a head. However, any new processing plant must compete with those in New Zealand, where the industry is 10 to 20 times larger and some operators are processing 50,000 head of deer a year.

A survey of other farmed game in each state of Australia was conducted. The report sets out estimated numbers of emus and ostriches as well as deer. These industries are all in the early stages of development and accurate figures for herd sizes and potential slaughter numbers are simply not available.

The demand for and cost of processing deer in Australia were assessed, the latter with and without processing some other farmed game species.

The supply for processing can only be estimated over a wide range at present because most of the farmed game industries are at an emerging stage of development. Given that between 15,000 and 30,000 deer could be slaughtered per annum during the next ten years, the processing costs were calculated based on four processing volume options. Gross margins based on selected prices of venison and co-products were between 13% and 20% for slaughter numbers between 10,800 and 25,740 for one central abattoir. The inclusion of an equivalent time for processing other species in the abattoir could increase the gross margin for processing venison to 27%.

Based on these results it was concluded that a level of about 20,000 head of deer per annum is the minimum for a commercially viable operation. Alternatively, a facility which processes fewer than 20,000 deer may also be viable if it processes other species as well.

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1. INTRODUCTION

This report on the processing of venison and other farmed was prepared for Gamekeepers of Australia Pty Ltd, a company owned by Alan and Barbara Rundell of Cardinia, Victoria. The report covers the processing demand for farmed game and the capital and operating costs of a processing plant. Another part of the assignment for Gamekeepers of Australia involves the preparation of a Business Plan for a specific processing facility.

The assignment has been partly funded by the Agribusiness Programs unit of the federal Department of Primary Industries and Energy (DPIE), and partly by the Rural Industries Research and Development Corporation (RIRDC). The objectives of the activity funded by RIRDC were to assess processing demand nationally for deer and other game species and thence the capital and operating costs of processing.

The assignment involved visits and discussions with participants in the deer farming and processing industry in New South Wales, Queensland, Victoria and Tasmania. In addition a survey was conducted among industry experts, advisers and government departments in relation to ostrich, emu and deer farming in all states of Australia.

Data on capital and operating costs have been presented for a number of alternative levels of throughput. Marketing, finance and other commercial considerations are beyond the scope of the report. However, an indication of possible prices for some different products which might be obtained in domestic and export markets is provided. The inclusion of price points enables the calculation of the gross margins which would result from different levels of throughput. It also highlights the effect of processing other farmed game on the gross margins from processing only deer.

2. THE AUSTRALIAN DEER INDUSTRY

The Australian deer industry has been described in official reports[1,2] and numerous other documents referred to throughout this report. This report does not attempt to present a comprehensive description of the industry.

2.1 Deer Farming in Australia

The estimated deer population by state based on survey and other information is as follows:

State	'000 Head
Queensland	20
New South Wales	65
Victoria	55
Tasmania	18
South Australia	18
Western Australia	13
Total	**189**

2.2 Venison Processing in Australia

Venison produced in Australia is mainly slaughtered and boned under contract by commercial abattoirs which also process sheep and/or cattle. Contract slaughtering for domestic consumption typically costs farmers $20 a head for Fallow deer (on a sheep meat line up to 40Kg dressed weight) or $40 a head for Red deer (on a cattle line). Contract boning costs a similar amount. The result is that it is marginally economic to slaughter and bone Red Deer hinds and Fallow bucks with an average dressed carcass weight of 65kg and 34kg respectively. Fallow does (22Kg) are not considered viable at these prices. They are therefore not processed in significant numbers at present in Australia.

The absence of cost effective processing for deer has resulted in a state of flux in the industry. Increasing numbers of Fallow does are of marginal value for venison. Both Red Deer and Fallow does are not viable for export processing. Their value for breeding has plummeted as a result. While collection of antler for velvet provides a good return, it is insufficient by itself to make deer farming viable. Many farmers are considering selling their herds and leaving the industry. A few have done so.

There are some operators in Australia beginning to go down the path of processing and adding value. There are operators in each state who purchase stock from deer farmers, arrange contract slaughter at commercial abattoirs. In some cases they use export-licensed boning rooms to produce venison, and in some cases have built small boning rooms to produce venison products for the domestic market. Gamekeepers of Australia Pty Ltd, operating at Cardinia in the Gippsland area of Victoria, has done all of these. Other Australian operators include farmer co-operatives, private and farmer-owned businesses.

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[1]RIRDC Report: Deer Marketing and Production Study, Final Report, June 1991

[2]RIRDC and Deer Industry Development Group: Venison Market Development Plan, Final Main Report and Annexes, June 1992

Based on the slaughter levy collected nationally an estimated 11,000 deer were processed through abattoirs in 1992/93 and 15,000 in 1993/94. It is difficult to predict numbers due to the various stages of growth in the industry and other factors such as drought. Predictions vary from 12% of the population in New South Wales[3] to 17% in Tasmania. The range used in subsequent analysis is from approximately 11,000 to 26,000.

2.3 Processing for Export

The cost of slaughtering and boning appears reasonable to produce a marketable domestic product, although many farmers consider current price levels of around $1.70 a kilo live weight to be far too low. Many abattoirs will not consider processing deer at all because the volumes are small and it disrupts their work flow to a major extent. Processing tends to be done in the smaller works, or under sufferance to satisfy bigger farmers.

The problem is more acute for export processing. Big export works are most reluctant to process small quantities of deer. Typical charges for fallow bucks are $25 for slaughtering on a sheep chain and between $25 and $40 for boning. At these prices it is not economic to process does, nor is it to slaughter Red deer on a cattle chain where prices are considerably higher.

Venison processors say that even fallow bucks are not economic for export with these costs, to which must be added the RIRDC levy and packaging costs. Export abattoirs say they lose money at these prices and would far prefer not to do it at all. The problem for abattoirs is exacerbated by the fact that when processing cattle they retain the skins. For contract processing they retain the offal as well. Processing deer does not provide sufficient volume to make collection, treatment and packaging of these co-products worthwhile.

The answer appears to be to establish a specialist deer slaughtering and boning facility for export venison. A dedicated venison works would have the advantage of being able to collect co-products said to be worth about $30 to $40 a head. Another possibility is processing other farmed game such as ostrich, emu, goat and/or other species in the same works. Most of the emerging or "exotic" farmed meats have the same problem of no dedicated processing facilities.

The costs of building and operating a specialist export works for farmed game are likely to be high, particularly if the throughput is low. AQIS charges are a major expense. They include an annual registration fee of $45,000 for EC accreditation. Inspection fees are $67,500 p.a. for meat inspection and $104,000 for veterinary staff. The inspection fees but not the registration fee are reduced for less than full-time operation.

An export works to EC standard has very high construction and hygiene standards[4]. It needs substantial infrastructure such as roadworks and amenities and requires separate yarding, killing and carcass chilling facilities for different species.

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[3] Mackay, B.I. (NSW Agriculture): Venison - Production and Marketing, Beef Products Marketing Strategy Workshop, Dubbo, Feb 16-18, 1993

[4] Australian Quarantine and Inspection Service: "Construction and equipment guidelines for export meat, Second Edition, 1988 and Amendment (mdadeer T91/823): Processing Deer for Export

2.4 The New Zealand Deer Industry

The New Zealand industry has been established much longer and is ten to twenty times bigger than Australia. It appeared in the past to be internationally competitive, but two major companies in the New Zealand deer industry went into Receivership in 1994. Efficiency and financial viability appears to vary widely among different operators. The industry is largely self-regulating. It has recently introduced a national appellation scheme.

The New Zealand industry development strategy is based on the establishment of Deer Slaughtering Premises (DSPs) which are export-standard abattoirs and boning rooms. There are about 12 DSPs in the country owned by about five operators comprising private companies and farmer co-operatives. Their capacities vary from about 35 to about 100 head per day. They do not necessarily slaughter five days a week or at all times of the year.

New Zealand is a significant exporter of venison products to world markets. For instance, of its 15,000 tonne production in 1991, 7770 tonnes went to West Germany, which was approximately 50% of that country's imports. Quantities have been increasing, but the effect of the recent company collapses may affect growth.

2.5 International Competitiveness

The Australian deer farming and venison production industry must be able to compete with New Zealand, both domestically and internationally, if it is to be financially viable. This would appear to represent a major challenge for an industry only a fraction the size. Both the Australian industry and individual operators must develop a sustainable competitive advantage against New Zealand operators if they are to survive.

The size of the Australian herd suggests that there may be 15,000 to 30,000 head of deer available for slaughter. Last year New Zealand slaughter numbers were 417,000. The largest New Zealand DSPs are understood to process some 50,000 head per annum.

Given any reasonable economies of scale, one DSP in Australia will barely be able to compete internationally with the best in New Zealand. Even so, the cost of transport would yield a lower price to farmers considering the much greater distances in Australia.

Australian AQIS requirements and work practices result in significantly higher fixed costs compared with DSPs in New Zealand. Labour costs are lower and labour productivity is generally higher in New Zealand. These factors alone suggest that it will be hard for an Australian processor to compete.

In recent times the prices paid for live deer in New Zealand have been high, while prices for venison in export markets have been low. These factors undoubtedly affected the two major venison companies which recently went into receivership. That does not alleviate the competitive position in the short term. There are said to be very large stocks of frozen New Zealand venison and, in any case, the remaining processors and exporters will not hesitate to wage a price war to keep Australia from gaining a toe-hold in the international market.

Any Australian business will have to have a clear area of competitive advantage to survive against established NZ export businesses with higher volume, lower prices and a lower exchange rate (albeit higher freight rates). A possible answer is a multi-species works which processes emu, ostrich, goat or other farmed animals to produce a higher throughput and lower costs for the business as a whole. Other potential advantages are Australia's disease-free status and the "clean and green" images used to good marketing effect, particularly in Tasmania.

There would also appear to be the potential in Australia, starting from scratch, to establish better business structures and better management practices than some of the New Zealand operators.

2.6 Strategic Issues

The most important strategic questions for potential Australian operators are:

- Can an individual Australian operator eventually compete in efficiency and quality with the best of the New Zealand DSPs?
- Are there particular export market segments or product opportunities where an Australian competitor could "steal a march" on New Zealand operators?
- Are there opportunities in terms of business or industry structures, export compliance or government support which could provide an initial or sustainable competitive advantage to an Australian producer?

Qualitatively, there do appear to be opportunities in all of these areas for a good Australian operator to compete. For instance:

- The unorganised nature of the local industry presents the possibility to determine the optimum size for a slaughtering and boning facility and to establish a new integrated business to fill the gap, which may also include production of smallgoods from the by-products of processing.
- A significant Australian advantage is the absence of disease in the national herd and the presence of TB in New Zealand. The loss of the Malaysian market by New Zealand due to Halal slaughtering malpractices has opened that market to Australian processors. There may be other such opportunities. Two excellent reports on the European market for venison[5][6] emphasise the opportunity to gain market share by producing attractively packaged "new style portion control cuts".
- The Venison Market Development Program, a major initiative of the Deer Industry Development Group and the RIRDC, has accumulated valuable information on domestic and export markets for venison. There is currently no large Australian processor to take advantage of that work on a significant commercial scale.

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[5]Raab, E: Processing Deer into Venison for the European Market, University of Western Sydney, Hawkesbury, 1992

[6]Raab, E: The German Venison Market, University of Western Sydney, Hawkesbury, 1992

- The apparent disadvantage of the small size of a dedicated deer abattoir in Australia may be offset in two ways. Firstly, the opportunity to collect all the co-products from deer processing, estimated to be worth $35 a head, is likely to significantly offset the dis-economies of scale. Secondly, compared with New Zealand processors who have the same opportunity, a multi-species abattoir which also processes high-growth products such as emu and ostrich may be more attractive.

- Compliance with Australian AQIS requirements for export meat processing is likely to lead to a higher quality product than that produced in countries with lower standards, notwithstanding the high cost of compliance.

- The opportunity clearly exists for one or more professional private operators to establish an internationally competitive processing operation and dominate the Australian industry. The availability of government assistance from a number of sources could provide timely and valuable support for professional planning and market development.

To summarise, the Australian deer industry appears to be relatively unorganised. It is at a crossroads in its development, and faces intense competition from New Zealand. These same characteristics, however, create the opportunity for one or more operators to develop slaughtering, boning and smallgoods operations of high quality and efficiency, with the potential to dominate the industry. Significant export sales must be an integral part of that development.

3. SURVEY OF FARMED GAME IN AUSTRALIA

A survey of the numbers of various species of farmed game, and the number available for slaughter, was undertaken.

3.1 Methodology

The objective of the survey was to collect data on some livestock which, with deer, are classified as new animal industries and which are, or might be, farmed for meat production.

The methodology used to gather information was to make telephone contact with as many identifiable sources of information as possible. Some initial contacts were derived from visits made to industry participants in New South Wales, Queensland, Victoria and Tasmania.

Where the individuals contacted were willing and able to provide information, a short questionnaire was sent which outlined the data required. A copy of the questionnaire is annexed as Appendix A.

The following information is based on the responses from those questionnaires. Some responses were written, others oral, and the level of detail between responses was variable. The sources of information include Industry Associations, State Departments of Agriculture and Primary Industries and academics. A full list of sources is included in Appendix B.

Much of the data is equivocal. There appears to be problems in both monitoring and recording species numbers. In addition, the opinions expressed in relation to many of the questions differed between sources. Due to the various sources of information and the universally reported difficulties in accurately monitoring species numbers, upper and lower estimates are provided in assessing the numbers of different species being farmed in each state of Australia whenever data was available. Where differing or additional opinions have been expressed with respect to other questions, an endeavour has been made to report the differing views, and attribute them where relevant.

3.2 Emus

3.2.1 Numbers of Emus

The numbers of emus being farmed in Australia and other statistics including estimated kills for 1995/96 are summarised in the following table[7].

State	Licensed Emu Farmers	Bird Population 31/5/94	Estimated Chickens 1994	Estimated Kill 1995/96
WA	50	34,500	25,000	25,000
SA	40	5,000	8,000	2,000
QLD	14	300	700	3,000
NSW	110	3,000	3,000	??
VIC	400	24,000	30,000	3,000
TAS	30	1,500	5,000	0

3.2.2 Growth Rates

The Western Australia Department of Agriculture believes that growth rates will depend on demand for breeding stock and overseas demand for product, but are unwilling to give an estimate. Paul Kent of Queensland Department of Primary Industry estimates growth of 10-20% pa for the next 3. John Dingle of the University of Queensland estimates that in 1995 there will be 25 000 breeding pairs producing 125 000 chicks, on an assumed production of 10 live chicks per female. Chris Tuckwell of Primary Industries of South Australia estimates a breeding pair will produce 15 live yearlings per annum. The high reproduction rate for emus thus suggests the number being farmed could increase rapidly and exponentially if markets for emu products are available. Neville Munns of the Emu Farmers Federation reports that overseas demand (mostly Asia) for emu meat, oil and to a lesser extent leather, is outstripping current supply.

3.2.3 Numbers Available for Slaughter

In 1993 approximately 6500 emus were slaughtered in WA alone, and as many as 15 000 are estimated to be slaughtered in 1994. The availability of emus for slaughter is influenced by the demand for breeding stock. Neville Munns reports that 17 000 live emus were exported from WA to the eastern states in 1993. John Dingle believes the demand for breeding stock will level off as the number of emu farms stabilises, and most excess birds will therefore be available for slaughter.

Emus are normally slaughtered between 50 and 70 weeks of age (12-16 months). The dressed weight is 18-20 kg, with an estimated meat yield of 10-12 kg.

[7] Source: *Australian Emu* No 1, 1994

3.2.4 Special Considerations

Farming
- emu farms must be licensed
- all farms require 2 metre high security fences
- most states have a minimum requirement of 100 birds per farm (Victoria and NSW are the exceptions)
- most emu farms are intensive lot-feeding operations
- a code of practice for emu husbandry has been prepared
- in WA, emus cannot be taken from the wild
- must comply with national code of practice for farming and slaughtering native animals
- movement of animals across states affected by exotic and notifiable diseases requirements
- live emus cannot be exported (except to an approved zoo)

Slaughtering
- licences required for emu slaughterhouses
- only captive bred stock can be slaughtered
- export permits required for emu products
- health regulations apply to meat for human consumption
- emus are classed as poultry, and must therefore be slaughtered in registered poultry abattoirs
- government meat inspectors must be present at each slaughter until abattoirs have approved "Quality Assurance" programs
- 2 emu only abattoirs are in operation in Western Australia
- slaughter costs are currently approximately $80 per bird[8]
- there is an acknowledged need for a multi species abattoir to offset the relatively low numbers of emus slaughtered per annum

3.2.5 Markets

A small market exists domestically for sale of breeding stock as well as for products such as meat, oil and leather. Meat is generally sold directly to restaurants.

Meat, oil and, to a lesser extent, leather is exported. Sales are measured on a product basis rather than by carcass. In 1992/3, 15 tonnes of meat was exported and a similar amount sold domestically. The major destinations for emu meat are France, the USA, New Zealand and China. A consortium of 5 emu farms in WA recently signed an export agreement with France worth $6 million over three years.

[8] Source: Paul Frapple, WA Dept of Agriculture, 1994

3.3 Ostriches

3.3.1 Numbers of Ostriches

The numbers of ostriches being farmed in Australia is summarised in Table O1.

LOCATION	NUMBER	
	Lower Estimate	Upper Estimate
New South Wales		3 400
Victoria		10 200
Western Australia	300	300
Queensland		2 550
South Australia		1 100
Tasmania		200
Other (NT, ACT)		
TOTAL (Australia)	10-15 000[9]	17 750[10]

Table O1

3.3.2 Growth Rates

Ostriches produce approximately 9 chicks per breeding pair per annum.

Bob Coombs of the Australian Ostrich Association estimates 50% growth per annum over the next three years.Chas Dale, General Manager of the Australian Ostrich Company Ltd assesses that at least 60,000 breeding pairs are needed to establish a commercial industry capable of reliably supplying export customers. Currently approximately 1% of Australian farmers are producing ostriches.

3.3.3 Number Available for Slaughter

Few ostriches are available for slaughter at present as most ostrich farmers are in the process of developing breeding stock, which are very expensive (up to $50 000 for adult breeders).

Slaughter is mostly on culls and is being done on a research basis. Bob Coombs reports that only about 100 will be slaughtered in 1994/95. The future slaughtering demands can be gauged by the AOA prediction of 100,000 birds by 1996. At a slaughter age of 15 months, 100,000 birds can be processed by 1998. Dressed weight is about 70 kg from a liveweight of 120 kg. The amount of boneless meat would be about 30 kg.

3.3.4 Special Considerations

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[9] Source: Western Australia Department of Agriculture.

[10] Source: Australian Ostrich Association - this number includes chicks. Bob Coombs provided estimates for Victoria, NSW and Queensland on a percentage basis. I have added to this estimates for South Australia (supplied by Chris Tuckwell of Primary Industries of South Australia), Tasmania (supplied by Malcolm Cowan of the Department of Primary Industries) and Western Australia (supplied by Peter Smetana at the Western Australia Department of Primary Industry).

Farming
There does not appear to be any special licence required to farm ostriches. According to Bob Coombs, deer type fencing is required, and special nutritional requirement exist. Birds should also be separated into age categories.

Slaughtering
To date, slaughtering has taken place on beef chains. Some adaptation of the chain is needed, and hide removal is particularly slow. Some export markets, such as France and Belgium, require slaughter in a species specific abattoir. AQIS approval is needed for export meat.

3.3.5 Markets

Domestically, there are some opportunities to sell meat and leather, but the market appears to be limited.

Internationally, the world trade of ostrich products is some $100 million[11]. Australia's export trade in ostrich products are undeveloped, but the following markets have been identified:

Meat

Europe, Scandinavia, Japan, USA. Bruce Mackay reports that he has received requests from France for 1000-1500 kilograms of ostrich meat per week. Australia has an advantage in that its ostrich stock is disease free, unlike our main rival, South Africa.

Leather

USA, Japan, Italy, West Germany, France, South Africa, Asia

[11] Source: Bruce Mackay, NSW Agriculture.

3.4 Deer

3.4.1 Numbers of Deer

The numbers of deer being farmed in Australia is summarised in Table D1.

LOCATION	NUMBER	
	Lower Estimate	Upper Estimate
New South Wales	48 620	65 000
Victoria	45 375	60 000
Western Australia	13 058	13 000
Queensland	20 000	25 000
South Australia	18 000	18 000
Tasmania	18 000	18 000
Other (NT, ACT)	n/a	n/a
TOTAL (Australia)	163 053[12]	199 000[13]

Table D1

3.4.2 Growth Rates

The growth rate in deer numbers on a national level slowed in recent years, declining from historical highs of 21-25 per cent to approximately 15%.[14] The anticipated growth rates are a matter of some speculation. The Queensland DPI suggest a growth rate of 10-15 per cent from natural increase. Western Australia Department of Agriculture expects minimal growth rates. NSW Agriculture sees a steady growth of 20% over the next three years, while the South Australia Department of Agriculture sees an increase of between 25 and 30 per cent per annum.

3.4.3 Number Available for Slaughter

The Deer Farmers Federation reported that in 1992/93 390 tonnes of venison was produced. The precise number of deer slaughtered is not clear, due to inaccurate or non-existent record keeping at most levels. Reports from various State departments indicate that in excess of 5 000 deer will be slaughtered in NSW in 1993/94 (up from 2657 in 1992/93), 500 deer were slaughtered in Western Australia in 1992/93 and between 1500 and 2 000 deer are slaughtered per annum in Tasmania.

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[12] Source: Industry Commission Draft Report Into Meat Processing, 1993, citing figures from Deer Farmers Federation of Australia.

[13] Source: This figure was derived from the totals given for each state, based on the following sources:
NSW, Victoria: Bruce Mackay, NSW Agriculture
Western Australia: Peter Smetana, WA Department of Agriculture
Queensland: Sandy McKenzie, Queensland Department of Primary Industries
South Australia: Chris Tuckwell, SA Department of Agriculture
Tasmania: Malcolm Cowan, Tasmania Department of Primary Industries.

[14] Source: Industry Commission Draft Report Into Meat Processing, 1993.

Most deer are slaughtered between 12 and 24 months, according to Bruce Mackay. He also advises that the dressed weight for Fallow deer is 30 kilograms, 55 kilograms for Red deer. However, the Western Australia Department of Agriculture advise that the age of slaughter is between 12 and 36 months, and the dressed carcass weights are 35-50 kilograms for Fallow, 40-50 kilograms for Rusa and 70-75 kilograms for Red deer. Chris Tuckwell at South Australia Department of Agriculture gives yet another estimate - 28 kilograms for Fallow and 35-40 kilograms for Red deer. Other sources offer even more ranges of weights.

3.4.4 Special Considerations

Farming
In NSW no special conditions apply as Deer are categorised as livestock. Deer farms must be licensed in Western Australia, Queensland and Tasmania. Each state appears to have its own set of regulations governing matters such as location, fencing etc.

Slaughtering
Deer must be slaughtered in a licensed abattoir. If the venison is for export, the abattoir must be accredited by AQIS and undergo the usual inspection procedures. Again, each state appears to have particular rules pertaining to slaughter.

3.4.5 Markets

There is a local market for venison, mainly in the restaurant trade. Deer meat is currently exported to Malaysia, Korea and parts of Europe and America, but there does not appear to be a consistent supply of venison of high quality and export markets are relatively undeveloped. According to the Industry Commission Report Into Meat Processing, some venison is imported from New Zealand to meet seasonal shortfalls in local demand.

Additional problems are posed by a lack of accredited abattoirs, high slaughtering costs and lack of experience in boning and cutting venison.

4. CAPITAL COSTS

The capital costs presented in this chapter are the costs of the fixed assets – land, buildings, plant and equipment, vehicles and establishment costs – needed to construct a new processing facility which includes slaughtering and boning of farmed game. A smallgoods production facility is also included.

The **total** capital cost of the project is the sum of these fixed asset costs plus the amount of "working capital" needed to establish the business. Working capital is the amount of funds needed to pay for the operation of the business until cash is received from the sale of products. Its major components are the value of stock and work in progress – calculated at their cost of production, not sale value – and the difference between the debtors and creditors of the business.

The amount of working capital required is not included in this chapter, and is beyond the scope of this report, which includes only fixed capital and operating costs. A complete Business Plan would include, in addition to the data in this report:

- the costs of marketing, administration and finance for the business
- the resulting profitability of the business as a whole
- cash flow forecasts, which determine the working capital required, and
- the return on investment for the **total** capital invested in the business

4.1 Plant Location

This report does not specify a specific location for a processing plant. That is a commercial decision to be made by the owners or prospective owners of a particular business.

The assumption is made, based on the information in Part 1 of this report, that the location would be in South Eastern Australia. More specifically, given the distribution of deer herds between states, it is likely to be in New South Wales or Victoria – the largest deer farming states. If, as has been suggested, it is only feasible at present to construct one deer processing facility in Australia because of economies of scale, the ideal location would appear to be in southern New South Wales or northern Victoria. Alternatively, two operations of smaller capacity may be feasible, presumably again in those two states.

If the availability of other farmed game for processing is sufficient, it may well be possible to establish a number of multi-species processing plants in Australia. From the data in Part 1, this may soon be the case for emu processing. In fact, the growth of the emu herd, based on potential production of up to 20 eggs per female as opposed to one fawn for deer, may dictate that deer processing should be regarded as an adjunct to emu or other game processing, not the other way around as is the case for this study.

The main factors to be taken into account in deciding plant location are proximity to farming operations and the cost of freight of finished product to markets or, in the case of exports, to airports.

It has been suggested that proximity to deer farming operations is not important because animals are purchased on the basis that transport is paid by the grower. However this approach overlooks the fact that what drives the viability of a processing operation is that the farmers receive a return which makes their own businesses viable. Any deer or other farmed game processing facility must look at the net return to farmers which result from its location.

A particular case in point for this exercise concerns processing deer farmed in Tasmania. Tasmanian deer farmers are very independent and are not members of the Deer Farmers Federation of Australia. They enjoy unique government regulations in regard to slaughtering and boning for domestic consumption, with individual farmers licensed to produce venison in on-farm processing works. They have their own agenda for the development of processing facilities in the state for both Australian and export markets.

However deer numbers in Tasmania, like other states, are concentrated among a small number of larger-scale producers. In addition, the sustainable number of animals per hectare is much higher in Tasmania than in mainland states. Some of the biggest Tasmanian deer farmers are also big producers of sheep and beef. It is not unusual for Tasmanian sheep and beef to be transported to the mainland for processing, and the same could well apply to deer and other farmed game. If the viability of a processing plant is primarily dependent on throughput, stock from Tasmania may well add a day's production per week to the total. The higher cost in that case would certainly have to be borne by the processor, unless of course a deal were struck to process Tasmanian deer in a mainland export-accredited works under contract. This may well appeal to Tasmanian farmers, and especially to the small number of professional producers of large numbers of deer.

4.2 Holding Farm

The quality of the venison produced from deer is highly dependent on their level of stress at the time of slaughter, as has been explained in numerous reports. The result of stress in slaughtered animals is ecchymosis – rupturing of the small blood vessels which results in a darkened or bruised appearance of the meat.

Deer develop stress from being transported, even over comparatively short distances. Any centralised processing plant could therefore include a holding facility where animals can be spelled after transport and prior to slaughter. The planned holding farm could also, if desired, operate as a finishing farm for animals of substandard quality or those from areas with inadequate feed.

A holding farm of 30 hectares has been included in the capital cost of the project.

Clearly, the size required depends on the location, as does its cost. A farm located in the lush Gippsland area of Victoria (such as that operated by Gamekeepers of Australia) or in an irrigated area in the Riverina in New South Wales could sustain many more animals in a smaller area. However, the price of the land reflects its holding capacity. A larger area of poorer land would be required. Again, the decision is a commercial one.

4.3 Fixed Asset Costs

The total cost of fixed assets for this project are set out in a three-page table at the conclusion of this chapter. The following comments apply.

Holding Farm

The holding farm described above is assumed to require 30 hectares at a value of $4,000 per hectare. Provision is made for roads and fencing, and for sheds and specialised deer handling facilities, of a high standard commensurate with the aim to maintain the highest quality standards throughout the process. Irrigation equipment is included for the efficient and proper disposal of treated effluent to the advantage of the business and the community.

Slaughter Floor

The cost of plant and equipment for the slaughtering facility has been put together based on detailed quotations from a New Zealand manufacturer of meat processing plant. The whole of the planned operations have been designed, at a minimum, to satisfy AQIS requirements. On a broader scale they have been designed to produce a product of world competitive quality, but keeping in mind the need for strict economy because this small-capacity plant must compete internationally with others of significantly higher capacity.

Chillers, Freezers etc

Items listed under Carcass Chiller, Blast Freezer, Freezer Store, Chiller Store and Load Out Area have been carefully sized to cover the present and future requirements of the proposed plant up to approximately five shifts per week operation. Some extensions would be required if the plant were to operate more shifts, e.g. ten shift per week operation including both deer and other farmed game. The costs of all these items are based on detailed estimates from appropriate Australian manufacturers and agents, as are the associated costs of refrigeration etc included under "Other".

Boning Room

The boning room assets include basic equipment to produce high-quality but not fancy products. More sophisticated equipment could be included to produce bar-coded package labels, portion-control individual packages and other means of making more up-market products aimed at specialty or niche markets. These should be the subject of individual assessment based on the expected premium which can be won in the market for specialty products. The basic equipment is designed for packaging boned product into 15, 20 or 25kg standard packs.

Smallgoods Production

Provision has been made for the production of smallgoods products – sausages and pate – from some of the by-products of the slaughtering and boning operations, namely trim and liver respectively. At this stage it is assumed that these will be only for Australian consumption, although the facilities are designed to export production standard.

Other Assets, Office & Amenities, Vehicles

The above assets have been costed to comply with the requirements of a modern and efficient meat processing facility to export-accredited standard, and are again based on detailed estimates from competent suppliers.

Establishment Costs

Estimates have been included of the capital costs which are necessarily incurred in the establishment of a new processing business of this nature. Most are self-explanatory. The cost of preparation of an Environmental Impact Study was obtained from a professional consulting organisation experienced in this area.

A summary of the capital cost of fixed assets for this project, which also shows the depreciation described in the following section, is as follows.

Table 4.1

Summary of Fixed Asset Costs

ASSET CATEGORIES:	Depreciation Rate	Capital Cost
LAND	0%	$128,000
"INTEGRAL" BUILDINGS	13%	$359,737
OTHER BUILDINGS	4%	$179,868
PLANT & EQUIPMENT	13%	$1,247,500
VEHICLES	20%	$65,000
ESTABLISHMENT COSTS	10%	$202,000
TOTAL		**$2,182,105**
ANNUAL DEPRECIATION		$249,336

4.4 Depreciation

The total cost of fixed assets for the project is an up-front cost, which must be separated from the on-going operating costs of the business, for good reasons.

The fixed assets can be financed in a number of ways. It would be normal to finance the majority of the fixed asset cost with loans, generally from a trading bank. Banks will normally finance most but not all of the value of fixed assets, secured by a "charge" or mortgage over the assets. The proportion depends on the type of asset. The owner of the business usually has to provide the remainder of the value of each asset. This is part of the owner's "equity" in the business.

The "cost" of the assets to the business operations takes the form of "depreciation". Depreciation is not the initial cost of the assets, not that proportion paid for by the owner. Rather, the initial cost is divided by the useful life of each asset, and each year that proportion of the original cost which has been effectively "used up" is regarded as a cost to the operations. That cost is known as depreciation.

Different types of assets have different depreciation rates, corresponding to the length of their normal useful life (or how long it takes for them to be "used up" and become of no commercial value). Land, for instance, does not get used up or reduce in value. It is therefore not depreciated at all; it retains its purchase value. Plant and equipment used to produce products does wear out and needs to be replaced in time. It is generally considered (especially by the Commissioner of Taxation, whose ideas in this area carry great weight) to have a normal life of about seven years. It should therefore be depreciated at 13% each year, i.e. 13% of its original value is "charged" to the business for each of the seven years of its life. Motor vehicles have an assumed useful life of five years, and are depreciated at 20% each year. Things like computers have an even shorter useful life – deemed to be about three years – and are depreciated at the faster rate of 33%.

Now, there are many variations to this simple concept of depreciation. They need no detailed explanation here, but keep many professionals wealthy and public servants occupied. One which is important is that a business owner has two choices in terms of depreciation rates. The "prime method" is as described above, whereby an asset is reduced in value by equal amounts each year over its life. The alternative is the "diminishing value" method, whereby a set percentage of the previous year's value is claimed as depreciation each year. For instance, plant and equipment may be depreciated at 20% each year, based on its "diminishing value", that being 80% of its value last year. This approach provides higher levels of depreciation in the early years, and smaller levels thereafter.

Table 4.1 shows the depreciation rates which have been applied to the various types of asset for the purpose of this exercise. It does require some more explanation, which is necessarily somewhat technical.

Firstly, the rates used are prime rates rather than those based on diminishing value, as they more closely reflect the annual cost of operation. Secondly, there are special depreciation provisions for meat processors[15]. A proportion of specified assets usually classified as "buildings" (and usually depreciable at only 4%) can, if "integral" to the abattoir's operation, be depreciated at the rate for plant and equipment (13% prime). The allowable proportion is currently two-thirds. This allowance is reflected in Table 4.1 under the category "Integral" buildings", accounting for two-thirds of total building costs.

Then total annual depreciation cost for all the fixed assets is shown in the last line. The critical question for the financial viability of the processing plant is whether its operations can generate sufficient sales from its production to cover the cost of depreciation as well as all other costs. Note that depreciation is not a cash cost; the value of the assets had to be paid for before the project started, however financed. But it is a real cost nonetheless and cannot be ignored if the business is to succeed.

[15] CCH Master Tax Guide, 1994

CAPITAL COSTS

	Units	Unit Cost	Total
HOLDING FARM:			
LAND NO. OF HECTARES	30	$4,000	$120,000
ROADS AND FENCING	1		$12,000
SHEDS & HANDLING	1		$85,000
IRRIGATION EQUIPMENT	1		$25,000
Total Finishing Farm			**$242,000**
SLAUGHTER FLOOR:			
ABATTOIR LAND	2	$4,000	$8,000
RESTRAINER LRG	1	$30,600	$30,600
RESTRAINER SML	1	$21,600	$21,600
RED DEER RIG	1	$80,000	$80,000
FALLOW DEER RIG	1	$35,000	$35,000
HEAD SPLITTER	1	$25,000	$25,000
STUNNER	2	$7,000	$14,000
HOCK CUTTER	2	$7,500	$15,000
HORN CUTTER	1	$7,500	$7,500
EVISCERA TABLE	1	$12,000	$12,000
RAILS TOTAL METRES	35	$100	$3,500
STERILIZERS	9	$400	$3,600
CONCRETE METRES SQ	163	$60	$9,780
CONCRETE COVING MTR	63	$20	$1,260
CONCRETE FOOTINGS	6	$300	$1,800
STEELWORK 6.5*16*4	650	$75	$48,750
PANEL METRES SQUARE	415	$100	$41,500
Total Slaughter Floor			**$358,890**
CARCASS CHILLER:			
CONCRETE METRES SQ	91	$60	$5,460
CONCRETE COVING MTR	66	$20	$1,320
CONCRETE FOOTINGS	6	$300	$1,800
STEELWORK 14*6.5*4 M3	336	$75	$25,200
PANEL METRES SQUARE	347	$100	$34,700
RAILS TOTAL METRES	185	$100	$18,500
Total Carcass Chiller			**$86,980**
BONING ROOM:			
VACUUM MACHINE	1	$10,500	$10,500
BAND SAW	1	$8,500	$8,500
SCALES	1	$5,000	$5,000
STERILIZERS	4	$200	$800
TABLES	6	$300	$1,800
CONCRETE METRES SQ	100	$60	$6,000
CONCRETE COVING MTR	30	$20	$600
CONCRETE FOOTINGS	6	$300	$1,800
STEELWORK 10*10*4	400	$75	$30,000
PANEL METRES SQUARE	220	$100	$22,000
RAILS TOTAL METRES	80	$100	$8,000
Total Boning Room			**$95,000**

CAPITAL COSTS (Cont)

	Units	Unit Cost	Total
BLAST FREEZER:			
CONCRETE METRES SQ	40	$60	$2,400
CONCRETE COVING MTR	32	$20	$640
CONCRETE FOOTINGS	4	$300	$1,200
STEELWORK 10*4*4	140	$75	$10,500
PANEL METRES SQUARE	152	$120	$18,240
Total Blast Freezer			**$32,980**
FREEZER STORE:			
CONCRETE METRES SQ	25	$60	$1,500
CONCRETE COVING MTR	10	$20	$200
CONCRETE FOOTINGS	2	$300	$600
STEELWORK 5*5*4	100	$75	$7,500
PANEL METRES SQUARE	125	$120	$15,000
RAILS TOTAL METRES	35	$100	$3,500
Total Freezer Store			**$28,300**
CHILLER STORE:			
CONCRETE METRES SQ	25	$60	$1,500
CONCRETE COVING MTR	10	$20	$200
CONCRETE FOOTINGS	2	$300	$600
STEELWORK 5*5*4	100	$75	$7,500
PANEL METRES SQUARE	125	$100	$12,500
RAILS TOTAL METRES	35	$100	$3,500
Total Chiller Store			**$25,800**
LOAD OUT AREA:			
CONCRETE METRES SQ	50	$60	$3,000
CONCRETE COVING MTR	18	$20	$360
CONCRETE FOOTINGS	2	$300	$600
STEELWORK 10*5*4	200	$75	$15,000
PANEL METRES SQUARE	170	$100	$17,000
RAILS TOTAL METRES	45	$100	$4,500
Total Load Out Area			**$40,460**
SMALLGOODS ROOM:			
PREPARATION EQUIPT	1	$110,000	$110,000
COOKING EQUIPMENT	1	$25,000	$25,000
PACKAGING EQUIPMENT	1	$25,000	$25,000
UTENSILS	1	$5,000	$5,000
TABLES	3	$300	$900
CONCRETE METRES SQ	12	$60	$720
CONCRETE COVING MTR	15	$20	$300
CONCRETE FOOTINGS	2	$300	$600
STEELWORK 4*3*4	48	$75	$3,600
PANEL METRES SQUARE	68	$100	$6,800
Total Smallgoods Room			**$177,920**

CAPITAL COSTS (Cont)

	Units	Unit Cost	Total
OTHER:			
ELECTRICITY KVA RQRD	500	$180	$90,000
ELECTRICAL BOARDS	500	$125	$62,500
GAS	1	$80,000	$80,000
AIR COMPRESSOR	1	$55,000	$55,000
HIDE SALTING	1	$5,000	$5,000
STATIC SCREENS	1	$6,700	$6,700
SAVE-ALL TANK	1	$2,000	$2,000
FLIGHT PUMP	1	$4,500	$4,500
PUMPS	5	$500	$2,500
REFRIGERATION	1	$245,000	$245,000
LIGHTS	15	$500	$7,500
SERVICES CONNECTION	1	$75,000	$75,000
INSTALLATIONS	1	$150,000	$150,000
Total Other			**$785,700**
OFFICE & AMENITIES:			
CONCRETE METRES SQ	50	$60	$3,000
CONCRETE FOOTINGS	4	$300	$1,200
STEELWORK 10*5*2.5	125	$75	$9,375
PANEL METRES SQUARE	125	$100	$12,500
SERVICES / FACILITIES	1	$15,000	$15,000
Total Office and Amenities			**$41,075**
VEHICLES:			
FORKLIFT	1	$20,000	$20,000
CAR	1	$25,000	$25,000
TRUCK	1	$20,000	$20,000
Total Vehicles			**$65,000**
ESTABLISHMENT COSTS:			
BUSINESS PLANNING	1	$32,000	$32,000
PLANS & DRAWINGS	1	$20,000	$20,000
COUNCIL APPLICATION	1	$10,000	$10,000
AQIS APPLICATION	1	$15,000	$15,000
E.I.S. PRODUCTION	1	$65,000	$65,000
PROJECT MANAGEMENT	1	$40,000	$40,000
BUSINESS FORMATION	1	$20,000	$20,000
Total Establishment Costs			**$202,000**
TOTAL CAPITAL COSTS			**$2,182,105**

ASSET CATEGORIES:	**Depr'n Rate**	
LAND	0%	$128,000
"INTEGRAL" BUILDINGS	13%	$359,737
OTHER BUILDINGS	4%	$179,868
PLANT & EQUIPMENT	13%	$1,247,500
VEHICLES	20%	$65,000
ESTABLISHMENT COSTS	10%	$202,000
TOTAL		**$2,182,105**
ANNUAL DEPRECIATION		$249,336

5. OPERATING COSTS

This chapter sets out the operating costs of the proposed processing plant for slaughtering, boning and smallgoods production.

Production data, direct operating costs and a summary of products produced by each operation are contained in three spreadsheet pages at the end of this chapter. The important figures from the spreadsheet are included in the text of this chapter as tables, so as to enable the development of the analysis to be followed.

5.1 Slaughtering

In the accompanying sheet headed "Production - Slaughtering" the production data are set out at the top of the page. It is based on the use of a specialised Red Deer rig from New Zealand with a capacity of 24 Red Deer per hour. Only small increases in throughput are possible for Fallow bucks and does. Their lower weight leads to a much lower liveweight and dressed weight capacity.

The prices paid for live animals are the current market rates of $1.70 per kg for Red Deer and $1.80 for Fallow bucks. Fallow does, if processed, would attract only $0.90c a kilo because of their significantly lower dressed weight.

It is assumed that operations will be in whole days of 7.5 hours so as to minimise inspection charges. AQIS veterinary inspection is based on their minimum time of four hours. Meat inspection is based on the current AQIS daily rate.

The rig normally requires only four labour to operate. Two are assumed to be skilled permanent staff, paid as "tally labour" on the number of head processed. The remaining two hourly-paid labourers has been increased to five in this exercise to allow sufficient time to collect all of the valuable co-products from each animal listed at the bottom of the page. It may be possible to reduce this number as experience is gained. Labour rates include on-costs and are indicative of those paid in the industry for non-permanent labour.

The resulting Direct Cost of Production for slaughtering operations is shown in table 5.1.

Table 5.1

Direct Cost of Production - Slaughtering

Per Day	RED DEER	FALLOW BUCKS	FALLOW DOES
Animal cost per kg live weight	$1.70	$1.80	$0.90
Live Animal Cost	$37,944	$23,895	$9,686
RIRDC Levy (18c/kg D.W.)	$2,210	$1,314	$1,027
Direct Labour	$923	$1,013	$1,088
Inspection	$584	$584	$584
Consumables	$580	$580	$580
Total Direct Cost	$42,240	$27,386	$12,964
Cost per kg live weight	$1.89	$2.06	$1.20
Cost per kg carcass weight	$3.44	$3.75	$2.27

5.2 Boning

The production figures for the boning operation are shown in a similar format. The throughput rates are the same as for the slaughtering operation.

Labour requirements are for two tally labourers, two hourly-paid labourers and one sawyer. Note that there is a separate allowance for a Production Manager who may well be involved in production as well as management.

AQIS meat inspection is calculated at the current daily rate. Again, it has been assumed that the boning room will only operate in full 7.5 hour days.

The products of the boning room are shown at the bottom of the page.

The resulting direct cost of production is set out in Table 5.2.

Table 5.2

Direct Cost of Production - Boning

$ Per Day	RED DEER	FALLOW BUCKS	FALLOW DOES
Carcass Cost from Slaughtering	42240	27386	12964
Direct Labour	713	803	878
Inspection	333	333	333
Consumables	954	568	443
Packaging	1395	830	648
Total Direct Cost	**45635**	**29919**	**15267**
Cost per kg carcass weight	3.72	4.10	2.68
Direct Cost excl Carcass	3395	2533	2302

5.3 Smallgoods Production

It has been assumed that the deer processing operation will include production of smallgoods from by-products of slaughtering and boning. In particular, there are known to be good domestic markets for venison sausages produced from trim and for pate produced from livers. The accompanying production sheet is based on processing only 10% of the trim and livers from each day of processing. That would require 36 hours of labour when Red Deer are processed and only 25 hours when Fallow bucks are processed. The possibility exists to greatly expand this production if significant domestic and export markets can be developed. The smallgoods production facility has been designed with that in mind.

The amounts and costs of ingredients are based on formulations used very successfully by Gamekeepers of Australia.

The direct production cost of smallgoods from one day each of slaughtering and boning, using only 10% of available trim and liver, are in Table 5.3.

Table 5.3

Direct Cost of Production - Smallgoods

$ Per Day	RED DEER	FALLOW BUCKS	FALLOW DOES
10% of Trim Available	241	156	74
10% of Liver Available	18	23	26
Total Sausages Produced	465	302	143
Total Pate Produced	29	36	42
Labour Hours to Produce	36	25	14
Direct Cost of Production	**$1,627**	**$1,121**	**$626**

PRODUCTION - SLAUGHTERING

PRODUCTION DATA:

	Units	RED DEER	FALLOW BUCKS	FALLOW DOES
HOURS WORKED PER DAY		7.5	7.5	7.5
THROUGHPUT RATE	hd/hr	24	30	35
LIVE WEIGHT	kg / hd	124	59	41
TOTAL LIVE WEIGHT		22320	13275	10763
YIELD	% live	55%	55%	53%
CARCASS WEIGHT		68	32	22
TOTAL CARCASS WEIGHT		12276	7301	5704

Labour:		**Number**	**Rate**
TALLY LABOUR	per hd	2	$1.00
LABOURERS	per hr	5	$15.00

Inspection:		**Per day**
A.Q.I.S. MEAT INSPECTOR	8 hrs/day	$324
A.Q.I.S. VET INSPECTOR	2 hrs/day	$260

Consumables:		
ELECTRICITY	per day	$180.00
AIR	per day	$100.00
GAS	per day	$200.00
WATER	per day	$100.00

DIRECT COST OF PRODUCTION:

Per Day		RED DEER	FALLOW BUCKS	FALLOW DOES
Animal cost per kg live weight		$1.70	$1.80	$0.90
Live Animal Cost		$37,944	$23,895	$9,686
RIRDC Levy	0.18	$2,210	$1,314	$1,027
Direct Labour		$923	$1,013	$1,088
Inspection		$584	$584	$584
Consumables		$580	$580	$580
Total Direct Cost		$42,240	$27,386	$12,964
Cost per kg live weight		$1.89	$2.06	$1.20
Cost per kg carcass weight		$3.44	$3.75	$2.27

SLAUGHTER PRODUCTS:

CO-PRODUCTS Per Head:	**Yield**	**Units**	**Unit Value**	**Value p hd**
Blood	75%	3	$4.00	$9.00
Heart	80%	1	$0.40	$0.32
Lungs	65%	2	$0.50	$0.65
Kidneys	80%	2	$0.25	$0.40
Liver	70%	1	$1.50	$1.05
Brains	85%	1	$0.60	$0.51
Tongue	85%	1	$0.35	$0.30
Eyes	80%	2	$0.50	$0.80
Skin	98%	1	$10.00	$9.80
Tail	80%	1	$5.00	$4.00
Pizzle and Testes	80%	2	$5.00	$8.00
Total				**$34.83**

PRODUCTION - BONING

PRODUCTION DATA:

	Units	RED DEER	FALLOW BUCKS	FALLOW DOES
HOURS WORKED	per day	7.5	7.5	7.5
THROUGHPUT	hd/hr	24	30	35
CARCASS WEIGHT	per hd	68	32	22
TOTAL CARCASS WEIGHT		12276	7301	5704
VENISON PRODUCTS	54.0%	6629	3943	3080
BONING CO-PRODUCTS	5.8%	712	423	331
FAT AND BONES	40.2%	4935	2935	2293

Labour:		**Number**	**Rate**
TALLY LABOUR	per hd	2	$1.00
LABOURERS	per hr	2	$15.00
SAWYER	per hr	1	$17.00

Inspection:		**Per day**
A.Q.I.S. MEAT INSPECTOR	8 hrs/day	$333

Consumables:		
FREIGHT	per kg	$0.10
CHILL/L-OUT	per kg	$0.03

DIRECT COST OF PRODUCTION:

Per Day	RED DEER	FALLOW BUCKS	FALLOW DOES
Carcass Cost from Slaughtering	42240	27386	12964
Direct Labour	713	803	878
Inspection	333	333	333
Consumables	954	568	443
Packaging	1395	830	648
Total Direct Cost	**45635**	**29919**	**15267**
Cost per kg carcass weight	3.72	4.10	2.68
Direct Cost excl Carcass	3395	2533	2302

BONING PRODUCTS:

PACKED PRODUCTS:

Venison:	**Yield**	**kg / ctn**	**Ctn cost**
SADDLE	14.3%	15	$3.80
PRIMALS	14.3%	25	$5.20
SHOULDER	14.3%	25	$5.20
SPARE RIBS	5.7%	25	$2.50
NECKS	4.0%	20	$2.50
SHANKS	1.4%	25	$2.50
Co-Products:			
SINEWS	0.1%	5	$3.00
TRIMS	5.7%	25	$2.30
FAT AND BONES	40.2%		

PRODUCTION - SMALLGOODS

SMALLGOODS PRODUCTION:

Per Batch	Sausages	Pate
Trim	15	
Liver		10
Other Ingred's	10	6
Water	4	
Total Weight	29	16
Trim/Liver Value per kg	$3.00	$1.50
Ingredients Value per kg	$2.03	$0.83
Labour hours	2.03	1.67
Labour rate	13.00	15.00
Packaging cost per kilo	0.10	1.00
Direct Production Cost:		
Per Batch	$94.54	$61.05
Per kg	$3.26	$3.82

SMALLGOODS PRODUCTION PER DAY:

Per Day	RED DEER	FALLOW BUCKS	FALLOW DOES
10% of Trim Available	241	156	74
10% of Liver Available	18	23	26
Total Sausages Produced	465	302	143
Total Pate Produced	29	36	42
Labour Hours to Produce	36	25	14
Direct Cost of Production	**$1,627**	**$1,121**	**$626**

6. TOTAL COST OF PRODUCTION

This chapter collects the direct costs of slaughtering, boning and smallgoods production into the total direct production costs for the processing operation. To the direct production costs are added the so-called "indirect production costs", also known as Factory Overheads. They include things like depreciation, repairs and maintenance, annual AQIS registration charges and production management. The total of direct and indirect production costs is the "total cost of production", which is one of the objectives of this assignment.

The total production cost will depend on how many days per week the plant operates and what species it processes. The question of what production volume is appropriate depends, in turn, on other factors such as the price which is paid for live animals and the number of animals available for slaughter. There is no clear answer to the question of what level of production volume should be planned for. It is a matter for commercial judgement by aspiring processors.

The approach adopted in this report is to calculate the total cost of production at four different levels of production volume. The financial viability of the project at each level is discussed in the following chapter of the report.

6.1 Production Volume Options

Four levels of production volume have been selected and are summarised in Table 6.1.

Table 6.1

Four Production Level Options

	Option 1	**Option 2**	**Option 3**	**Option 4 2 Shift Operation**
Number of Days per Week Operation:				
Slaughter Red Deer		1	1	1
Slaughter Fallow Bucks	1	1	1	1
Slaughter Fallow Does			0.5	0.5
Total Slaughter Days	**1**	**2**	**2.5**	**2.5**
Bone Red Deer		1	1	1
Bone Fallow Bucks	1	1	1	1
Bone Fallow Does			0.5	0.5
Total Boning Days	**1**	**2**	**2.5**	**2.5**
Total Working Days	**2**	**4**	**5**	**5**
Number of head p.a. for 48 week Operation	10800	19440	25740	25740

- **Option 1** is based on slaughtering Fallow bucks one day per week and boning them on another day. Annual volume would then be 10,800 head.

- **Option 2** slaughters Fallow bucks one day per week and Red Deer one day per week, then bones them on two other days, for 19,440 head p.a.

- **Option 3** adds to Option 2 the slaughter of Fallow does for half a day and their boning another half day, providing five days per week of operation and processing some 25,740 head per year in 48 weeks.

- **Option 4** is exactly the same number as Option 3 in terms of deer, but assumes that other farmed game are processed in the same plant for an additional five operating shifts per week.

Note that, in this study, only one effect of multi-species operation has been taken into account, and that is its effect on the total production cost of processing deer.

The total direct production costs of each of the four options are presented in Table 6.2.

Table 6.2

Total Direct Production Costs - Four Options

$'000 Per Week	Option 1	Option 2	Option 3	Option 4
Total Head Slaughtered	225	405	536	536
Direct Costs:				
Slaughter	27.4	69.6	76.1	76.1
Boning	2.5	5.9	7.1	7.1
Smallgoods	1.6	3.3	4.1	4.1
Total Direct Cost	**31.5**	**78.8**	**87.3**	**87.3**

6.2 Indirect Production Costs

Indirect Production Costs, also referred to as Factory Overheads, are those costs of production which are essentially "fixed". They are costs which do not vary if the production level goes up or down. Basically, they are annual costs incurred by the business and divided equally over the number of production weeks in the year. As such, they are normally distinguished from the direct or "variable" costs which largely depend on the volume of production.

It has been assumed that the proposed plant will operate for 48 weeks of each year. It is basically important to plan for continuous operation as far as possible. It is in many cases better to operate at a lower planned rate for the whole of the year than to have periods of high production followed by periods of no production. One of the main reasons for doing so is to maintain the employment of people whose skills are critical to the operation by providing essentially permanent employment (even if for other reasons they may be employed as casuals).

An underlying assumption of this proposal is that at least two key production staff would be employed for the whole year. They would be the "tally labour" included in slaughtering and boning production sheets. They may also be employed in smallgoods production and in operating the holding farm on days when there is no processing under Options 1 or 2. The Production Manager included in Factory Overheads fits into the same category.

The requirement for people to work with this sort of flexibility is essential to this proposal, but is unusual in the meat processing industry. To be competitive, this small business must attract and keep a minimum number of people with critical skills. It may therefore consider the possibility of formalising a unique enterprise agreement with its key employees.

The essentially "fixed" costs associated with production are set out in Table 6.3. Column 2 shows the annual value of those Factory Overheads. The depreciation figure is taken from the Fixed Asset summary outlined in Chapter 4. Repairs and maintenance is set at 5% p.a. of total fixed asset cost. AQIS registration is the annual establishment fee payable to AQIS. It is separate from, and additional to, the fees for meat and veterinary inspection included in the direct costs.

For Options 1 to 3 the annual level of indirect costs is simply divided by 48 – the number of weeks per year of planned operation. Option 4 assumes that the plant will operate for five shifts per week processing other farmed game as well as five shifts per week processing deer. The level of indirect costs applicable to deer processing is therefore half, because the costs are spread over ten shifts rather than five. This quantifies the effect commonly referred to as "synergy" The much overworked word "synergy" simply means sharing costs. Both the deer business and the business of processing other farmed game would benefit from sharing the one processing plant.

The level of Factory Overheads for each Option, is shown in Table 6.3.

Table 6.3

Factory Overheads - Four Options

$'000 Per Week **Factory Overheads:**	**48 Weeks**	**Option 1**	**Option 2**	**Option 3**	**Option 4**
Depreciation	249.3	5.2	5.2	5.2	2.6
AQIS Registration	45.0	0.9	0.9	0.9	0.5
Repairs & Maintenance	109.1	2.3	2.3	2.3	1.1
Insurance	50.0	1.0	1.0	1.0	0.5
Production Management	72.0	0.6	0.9	1.5	0.8
Vehicle Expenses	20.0	0.2	0.3	0.4	0.2
Holding Farm Costs	80.0	0.7	1.0	1.7	0.8
Total Factory Overheads		**10.9**	**11.6**	**13.0**	**6.5**

The total cost of production is the sum of the direct and indirect production costs. It is summarised for each option in the following chapter.

7. FINANCIAL VIABILITY

The total cost of production at any given operating level is a figure which, by itself, does not convey a lot of meaning. The financial viability of the processing operation is made clearer if the cost of production is related to the sales value of the products produced. That relationship is set out in this chapter.

As previously discussed, the financial viability of the business as a whole depends on a number of factors not considered in this report. They include the costs of marketing, administration and finance; the net profit after those expenses; the working capital requirements of the business; and the return on total investment which the whole operation provides.

The viability of the production function in isolation is measured by the gross margin. The gross margin, in this instance, is defined as the difference between the sales value of the products produced and their total cost of production. It is then often expressed as a percentage of the sales value.

A sound business has a gross margin which is sufficient to cover the costs of marketing, administration and finance and leave a healthy net profit. What is an acceptable level depends on a number of factors including the size of the business and the industry it operates in. Supermarket chains, for instance, have very low gross margins but very high turnovers. Luxury goods have the opposite characteristics. Food manufacturing is somewhere in between.

Big food processors may survive on a 10% to 15% gross margin and spread their overheads over high volumes. A small and specialised processor such as this will need a higher gross margin of perhaps 15% to 20% in order to be profitable. The high cost of export marketing, which will undoubtedly be required for success, means that the business must maintain low manufacturing costs.

It is rarely a sensible strategy for a small business to try to compete on price. The prizes from price competition invariably go to those with the lowest cost of production. They are usually the biggest players who have the highest volumes, the latest technology and the biggest marketing budgets. This business must concentrate on achieving relatively low production costs but concentrate on winning premium prices for its products, perhaps by directing them into "niche" markets, and certainly by maintaining the highest quality levels.

7.1 Products and Price Points

The processing operation will produce a range of venison cuts as well as co-products from both slaughtering and boning. The yields of slaughter and boning co-products were set out in the detailed production sheets in Chapter 5.

The question of the price at which the various products can be sold is a complex one whose answer requires the development of a whole marketing strategy for the business. Nevertheless, the current prices which different products attract in both domestic and export markets are known to the industry. The Market Development Officer of the Deer Industry Development Group provides a valuable service in this regard.

The market price points which have been assumed in this study in order to establish manufacturing gross margins are set out in Tale 7.1. It must be noted that these are prices which reflect the strategy outlined above of attracting premium prices for top-quality products. In that regard they reflect the philosophy of Gamekeepers of Australia, who commissioned this study.

It is well known that some considerably lower prices are often seen in both the Australian and export markets. In recent times they have been offered by a number of New Zealand operators and more recently by some Australian processors. The effect of lower prices on the viability of a dedicated venison processor are considered in the final section of this report.

Table 7.1

Products and Price Points - Four Options

PACKED PRODUCTS - $'000:

		Option 1	Option 2	Option 3	Option 4
Venison:	**Value/ kg**				
SADDLE	$17.00	17.7	47.6	54.5	54.5
PRIMALS	$10.30	10.8	28.8	33.0	33.0
SHOULDER	$6.50	6.8	18.2	20.8	20.8
SPARE RIBS	$2.50	1.0	2.8	3.2	3.2
NECKS	$1.00	0.3	0.8	0.9	0.9
SHANKS	$3.50	0.4	1.0	1.1	1.1
Boning Co-Products:					
SINEWS	$15.00	0.1	0.3	0.3	0.3
TRIMS	$3.00	1.2	3.3	3.8	3.8
FAT AND BONES	$0.06	0.2	0.5	0.5	0.5
Slaughter Co-Products:					
Total Value	$34.83	6.3	7.8	9.1	9.1
Smallgoods:					
Sausages	$7.00	3.3	2.1	1.0	1.0
Pate	$16.00	0.5	0.6	0.2	0.2
TOTAL SALES POTENTIAL		**48.5**	**113.8**	**128.7**	**128.7**

7.2 Gross Margins

The gross margins which result from the foregoing analysis are shown in Table 7.2

Table 7.2

Gross Margins - Four Options

$'000	Option 1	Option 2	Option 3	Option 4
Sales Potential	**48.5**	**113.8**	**128.7**	**128.7**
less:				
Direct Production Cost	31.5	78.8	87.3	87.3
Factory Overheads	10.9	11.6	13.0	6.5
Gross Margin	**6.1**	**23.4**	**28.4**	**34.9**
% Sales	13%	21%	22%	27%
Annual Slaughter Volume	**10800**	**19440**	**25740**	**25740**

Based on all the assumptions in the processing model as developed in this part of the report, the results show that the proposed plant, if operated only one day for slaughtering and one day for boning Fallow bucks (Option 1), has a gross margin of only 13% on potential sales of $48,500 per week, equivalent to about $2.3 million p.a. That level is considered not to be financially viable. The inclusion of business expenses for marketing, administration and finance are likely to be such that the business would not be profitable at that level of operation.

Option 2 has a gross margin of 21%, again based on all the foregoing assumptions. That may well be a viable level, depending on the structure and strategies adopted for the business. It requires a supply of some 20,000 head of deer a year. That may be considered reasonable for a plant in South Eastern Australia, reasonably centrally located with respect to deer farming operations.

Option 3 has a 22% gross margin, which would appear to provide a reasonable level of initial confidence in its viability. It requires, however, some 25,000 head of deer per year which is approaching the upper level of predicted availability. It may well be that higher prices for live animals would have to be offered to achieve that level, which in turn would reduce the profitability.

Option 4 shows the effect **on the gross margin of processing deer** of a multi-species processing operation, compared with the same volume in Option 3. It is perhaps surprising that the effect seems relatively small. The indirect costs which are spread by the multi-species operation turn out to be small in comparison with the direct production costs **at that level of operation.**

That is not to suggest that multi-species operation is not a desirable direction. Clearly it would be more beneficial to the deer operation at lower levels. Under Option 1, for instance, the effect of spreading the indirect costs over four days per week of work instead of two would be to increase the gross margin from 13% to 24%. That transforms the lowest volume option into a potentially attractive one.

7.3 Effects of Price Changes

The viability of the processing operation is highly dependent on the prices received for the products in the market and the prices paid for live animals. The effect of changes in these two variables is examined in this section.

The effect of product price changes has been determined by changing the price received for venison saddle and shoulder cuts from those used in the model ($17.00 and $6.50 per kg respectively). The lower prices are set at $14.00 for saddles and $4.90 for shoulders. These, in fact, are prices which have applied recently in domestic and export markets as charged by both Australian and New Zealand processors.

The effect of changes in the price paid for live animals is based on increasing those in the model by 20 cents per kilo live weight. The higher animal prices (and the levels used in the model) are: Red Deer $1.90 ($1.70); Fallow Bucks $2.00 ($1.80); and Fallow Does $1.10 ($0.90).

The effect of changes in both prices is shown in Table 7.3. Both are separately compared with the basic model as presented.

Table 7.3

Effect of Changes in Prices on Gross Margins - Four Options

$'000	Option 1	Option 2	Option 3	Option 4
Model as Presented	**6.1**	**23.4**	**28.4**	**34.9**
	13%	21%	22%	27%
Lower Product Prices	**1.3**	**10.5**	**13.6**	**20.2**
	3%	10%	12%	18%
Higher Live Animal Prices	**3.6**	**16.2**	**20.0**	**26.5**
	7%	14%	16%	21%

The results clearly show that the effect of some of the low prices being charged in the market would be to make the proposed processing operation uneconomic under any of the first three options, i.e. up to slaughter volumes of 25,000 deer a year. It seems doubtful that they are presently economic to those who are charging them unless their operations are considerably more efficient than this.

The effect of higher prices paid for animals is likewise to decrease the gross margin significantly, but not as much. The table suggests that higher prices could be paid by a high-volume multi-species processor. In fact they may have to be in order to attract the volume. Alternatively, the results may suggest that part of the cost of transport of live animals over long distances may be paid by the processor.

7.4 Conclusion

This study of the capital and operating costs of processing deer and other farmed game leads to the following conclusions.

- It will cost about $2 million for the fixed assets required to establish a modern, efficient and integrated processing operation including slaughtering, boning and production of smallgoods.

- One advantage of a dedicated processing facility is that co-products estimated to be worth $35 a head can be collected and marketed internationally.

- A level of operation of about 20,000 head of deer per 48-week year will be required to produce a reasonable gross margin for the manufacturing operation.

- Alternatively, the processing of other farmed game in the same volume as venison would lead to a viable operation (for deer) at 10,000 head per year. The economics of processing other species is not included in these considerations.

- The proposed operation should aim to produce an internationally competitive product in terms of quality and presentation. It must attract premium prices, both domestically and internationally. Low prices destroy its viability.

- A large deer processing operation, or a smaller volume multi-species works, may in time be able to pay slightly more for live animals than the present level.

APPENDICES

Appendix A: Questionnaire

PRO FORMA QUESTIONNAIRE

(Name of Species)

1. How many animals of this species are being farmed in:
(i) (name of state)
(ii) Australia

If known, please provide a breakdown of numbers on a state by state basis.

2. What is the anticipated growth rate for this species over the next three years, in terms of numbers being farmed?
(i) growth rate for 1994
(ii) growth rate for 1995
(iii) growth rate for 1996

If known, please distinguish between increases due to:

(iv) natural growth ie rate of reproduction
(v) imported stock (if applicable)

3. (i) How many animals are available for slaughter each year?

If known:
(ii) at what age are the animals slaughtered?
(iii) what is the approximate dressed weight of a slaughtered animal?

4. What special considerations exist with respect to these animals in terms of:
(i) farming
(ii) slaughtering
(eg health regulations, government legislation, export requirements etc)

5. What markets are currently available for these animals in terms of:
(i) domestic sales
(ii) export sales

If known, please provide approximate volume of sales in terms of:
- number of carcasses
- revenue

6. Are you aware of any current papers or publications on the farming of these animals?

If yes, please provide details.

7. Are you aware of any other individuals or organisations involved in the farming of these animals?

If yes, please provide details.

Appendix B: Sources for Farmed Game Survey

1. Peter Smetana
Manager, Intensive Industries
W.A. Department of Agriculture
Phone: (09) 368 3333
Fax: (09) 474 2479

2. Chris Tuckwell
Senior Livestock Officer,
Developing Industries
Primary Industries of South Australia
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3. Bruce Mackay
Livestock Officer,
NSW Agriculture,
Orange Regional Office
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4. Anne Southwell
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5. Hugh Griffiths
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6. Malcolm Cowan
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7. Paul Kent
Queensland Department of
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8. Ken Lang
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9. Barrie Restall
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10. Bob Coombs
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11. Sandy McKenzie
Queensland Department of
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12. Neville Munns
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Emu Farmers Federation of Australia
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13. Ian Knox
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Wool & Rural Studies Dept.
Geelong
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14. John Dingle
Gatton College
University of Queensland
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15. Peter Miller
Australian Quarantine &
Inspection Service (AQIS)
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