

# **DEER INDUSTRY MANUAL**

## **PART 1 INVESTMENT & ECONOMICS** (Second edition)

**Chris Tuckwell**

**Rural Industries Research and Development Corporation  
&  
Deer Products and Development Company**

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# Foreword

This publication is the first of a series of publications that collectively constitute the *Australian Deer Industry Manual* (seven parts in the series). This volume is the first reprint of the first part, Investment and Economics Deer Manual, produced in 1997.

This manual provides information about the Australian deer industry that is objective, factual and supportable. It is specifically written to remove doubts about the industry that are generated by speculative and insupportable information. However, budgets provided only show predictive estimates of outcome for the 'average' enterprises described. Users must remember that there are no right answers and outcomes for any enterprise budget are based on income, expense and production parameters used for a particular situation.

Although information provided in the manual is similar to original information, most information has been updated to reflect data that has become available and industry changes since the original manual was written. Budgets have been updated too with more input from farmers and changes are mostly reflected in the lower average annual labour requirements suggested for each enterprise.

This project was funded from industry revenue which is matched by funds provided by the Federal Government.

This report, a new addition to RIRDC's diverse range of over 600 research publications, forms part of our Deer R&D program, which aims to foster an Australian deer industry as a profitable and efficient mainstream agricultural enterprise.

Most of our publications are available for viewing, downloading or purchasing online through our website:

- downloads at [www.rirdc.gov.au/reports/Index.htm](http://www.rirdc.gov.au/reports/Index.htm)
- purchases at [www.rirdc.gov.au/eshop](http://www.rirdc.gov.au/eshop)

**Peter Core**

Managing Director

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# 1. Introduction

This manual is the first reprint of the original Investment and Economics Deer Manual produced in 1997.

Although information provided in the manual is similar to original information, most information has been updated to reflect data that has become available and industry changes since the original manual was written. Budgets have been updated too with more input from farmers and changes are mostly reflected in the lower average annual labour requirements suggested for each enterprise.

Throughout Australia's history, farm management was based principally on tradition, intuition and advice from trusted agricultural advisers. In animal production enterprises it was difficult to make 'wrong' decisions because commodity prices were high and stable. Any 'wrong' decision could be amended easily within a short time frame and profitability was not overly compromised.

Times have changed and Australia's commodity prices are closely linked to international markets and so are influenced by such factors as seasonal demand for product and international monetary exchange rates.

Today's agricultural production enterprises are rightly regarded as complex business entities in which every decision must be justified.

Justification for business decisions can relate to many factors including: profit, lifestyle, level of debt, location, management skills, market accessibility, etc.

If it is accepted that the primary goal of a commercial animal enterprise is profit, then investors and managers need a means of determining the relative profitability of alternative enterprises and the long-term future of the associated industry. Any worthwhile analysis of the performance of livestock enterprises must be based on accurate, accessible and timely records.

This manual provides information about the Australian deer industry that is objective, factual and supportable. It is specifically written to remove doubts about the industry that are generated by speculative and insupportable information however, budgets provided only show predictive estimates of outcome for the 'average' enterprises described. Users must remember that there are no right answers and outcomes for any enterprise budget are based on income, expense and production parameters used for a particular situation.

Although enterprise budgets always vary between years according to seasonal and market influences, budgets included here represent reasonable estimates of likely enterprise returns from 'average' enterprises with 'average' production parameters and 'average' costs and returns.

Although these 'average' enterprises never exist, the budgets provide a reasonable guide to estimate outcome from various deer enterprises at the time of printing.

Supporting statistics and information about the New Zealand and Australian deer industries provide information that should give investors confidence in the future of the Australian deer industry.

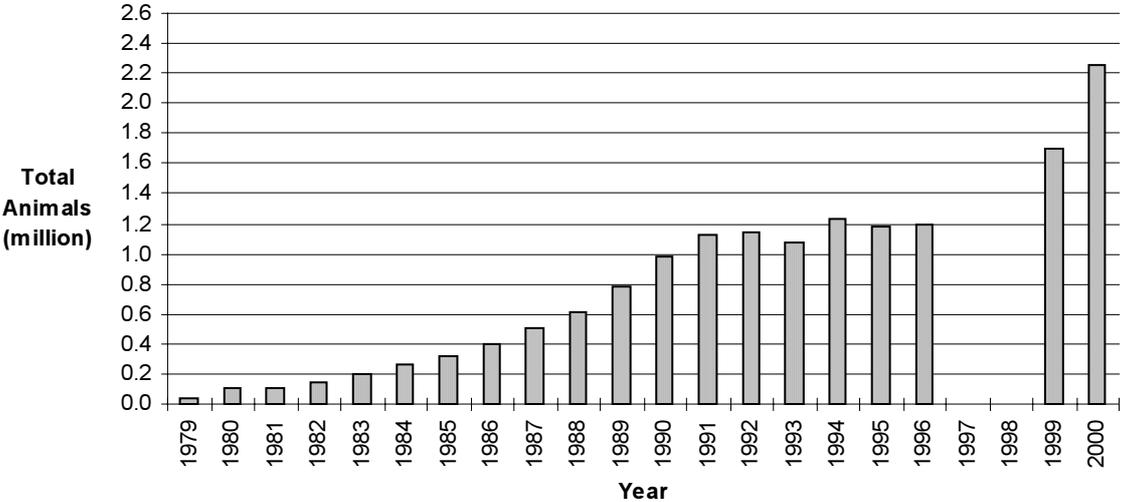
The Australian deer industry is establishing itself as a major Australian livestock industry.

## 2. The New Zealand Deer Industry

An examination of the New Zealand deer industry provides an insight to the opportunities that exist for the Australian deer industry.

Although New Zealand had access to a larger feral deer population than Australia from which foundation stock were sourced, the current Australian farmed deer population provides a very sound basis from which to expand.

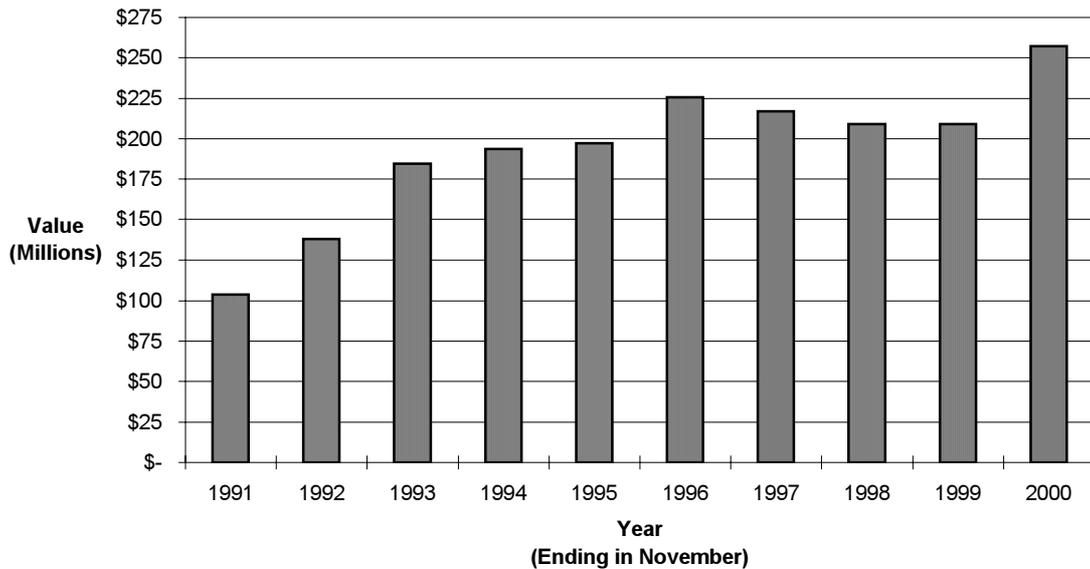
**Graph 1 - New Zealand Deer Population [4]**



*\*\*\* Data for 1997 and 1998 was unavailable at the time of printing.*

The New Zealand deer industry is the largest farmed deer industry in the world. It is the world's largest exporter of deer products including venison that is marketed throughout the world and velvet antler that is sought after in Asian markets.

**Graph 2 - Value of Exported New Zealand Deer Industry Products [4 & 13]**

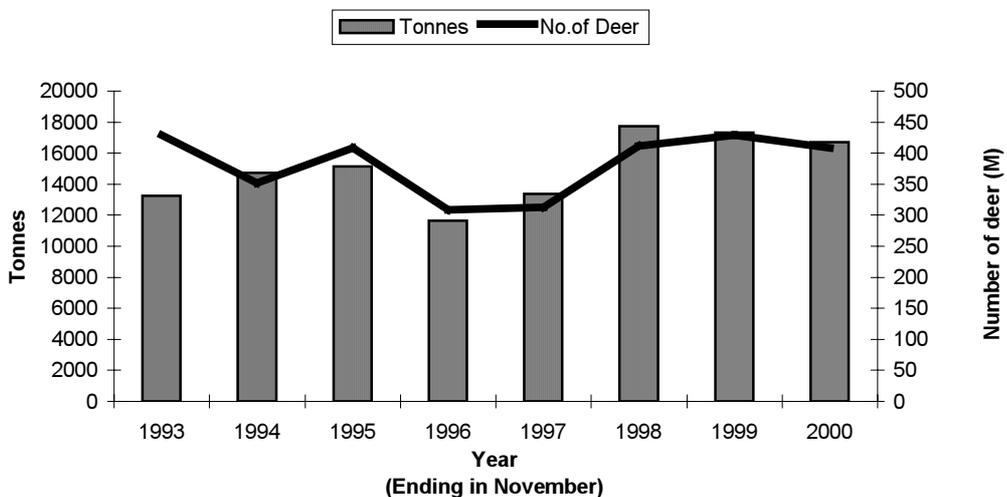


The value of product exported by the New Zealand deer industry has continually increased since commercial farming began in the mid 90's to peak at about NZ\$223M in 1996 followed by a slight decline. Total value began to increase after 1999 to reach about NZ\$257 M in 2000.

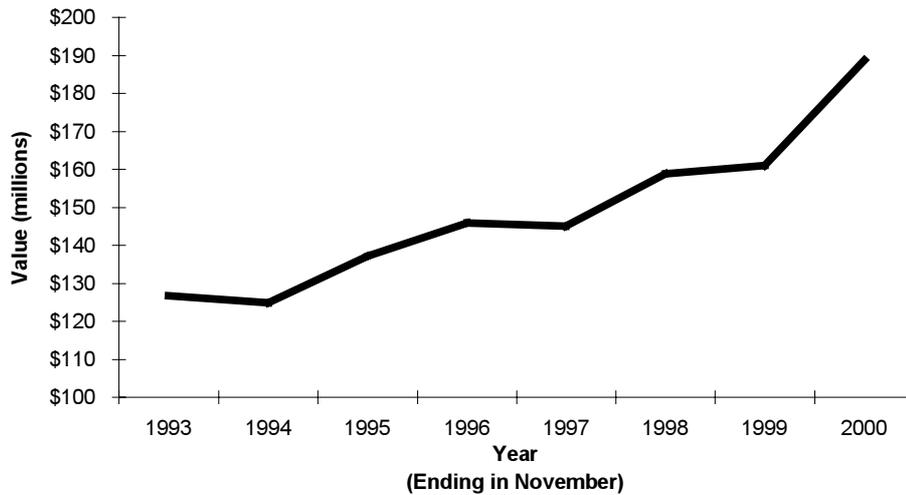
In 1996 velvet antler exports represented about 26%, venison 65% and industry co-products (excluding hides and leather) about 3% of export income. In 1998 and 1999 the contribution of velvet antler to exports fell to about 11.5% of total export income (venison increased to about 76.5%). However in 2000 velvet markets showed some recovery and velvet export sales contributed about 16% to total export income. The contribution of co products to the industry's export income has increased to about 5.5% in 2000.

The number of male animals killed each year tends to vary as the price of velvet antler fluctuates, however the industry exports between 11,000 and 15,000 tonnes of venison annually. This volume of venison is equivalent to approximately 10.0 to 14.5 times Australia's venison products.

**Graph 3a – Volume of New Zealand Venison Exports [11,12, 13 & 18]**

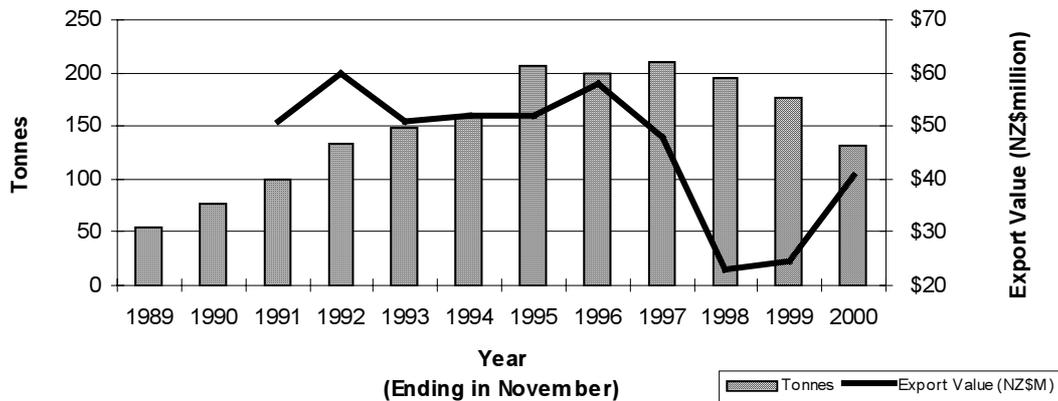


**Graph 3b – Value of New Zealand Venison Exports [11, 12, 13 & 18]**



New Zealand velvet output has also increased until 1997 but in recent years production has decreased to a production of approximately 132 tonnes of dried equivalent in 2000 or about 1500% greater than Australia's total production.

**Graph 4 - New Zealand Velvet Production (Dried) [12 & 13]**



The New Zealand industry demonstrates what could be possible in Australia with cooperative industry development and product marketing.

Major markets for New Zealand venison are the European Union and the USA. Halal processing for Muslim markets is generally not available in New Zealand. [4]

The Australian industry produces venison from both large and small species deer and can process product to Muslim requirements. This means Australia has some production/processing advantages that it should exploit for industry development.

### **3. Confidence in the Future of an Industry**

Those considering the long-term profitability of new enterprises should also consider a range of 'industry confidence factors' that influence opportunity for long term profitability of an industry. Those factors that are worthy of consideration include:

- Likely demand for products produced by a particular enterprise or industry;
- Availability of necessary industry processing and marketing infrastructures;
- Feasibility and costs of transporting products to markets or processing facilities;
- Availability of technical resources to assist industry development;
- Cohesiveness and objectiveness of industry organisations;
- Any environmental, logistical or cultural factors that will influence enterprise and industry development;
- Whether programs for the cooperative marketing of industry products, that will ensure uniformity of product description, quality and price, have been developed or are in preparation.

# 4. Development of Australian Deer Industry Confidence Factors

The Australian deer industry is well advanced with market and technological developments that allow confident commercial development.

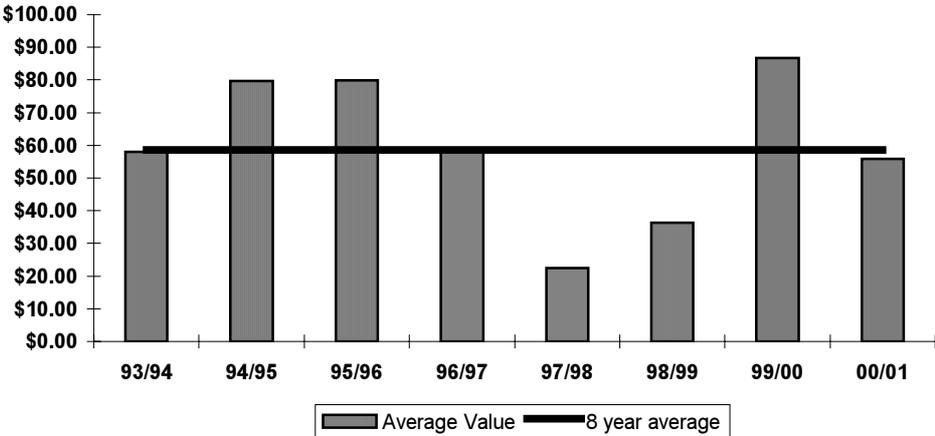
## 4.1 Product Demand

### Velvet

The majority of deer farmers cooperatively market their velvet antler through the Australian Deer Horn Company. Average returns across all grades of velvet to growers who market their deer antler through the company has not fallen below \$60.00 per kg since 1993/94 season and has reached \$80.00 per kg.

Actual returns for best quality velvet have reached \$170.00 per kg.

**Graph 5 – Average Velvet Price** (across all grades received from velvet sold by the Australian Deer Horn Company) [21]



### Venison

During 1992, in response to the Rural Industries Research and Development Corporation (RIRDC) funding of a deer marketing and production study, the Australian Venison Market Development Program was initiated.

The program ran until November 1994 and aimed to stimulate demand for venison with a goal of ensuring the long-term viability of the Australian Deer Industry.

In November 1994 the Venison Market Development Towards 2000 project began. This program was completed in 1996 and reports from Australia’s venison marketers indicate a significant increase in domestic demand for venison.

Reports from export marketers also indicate strong growth in European and North American

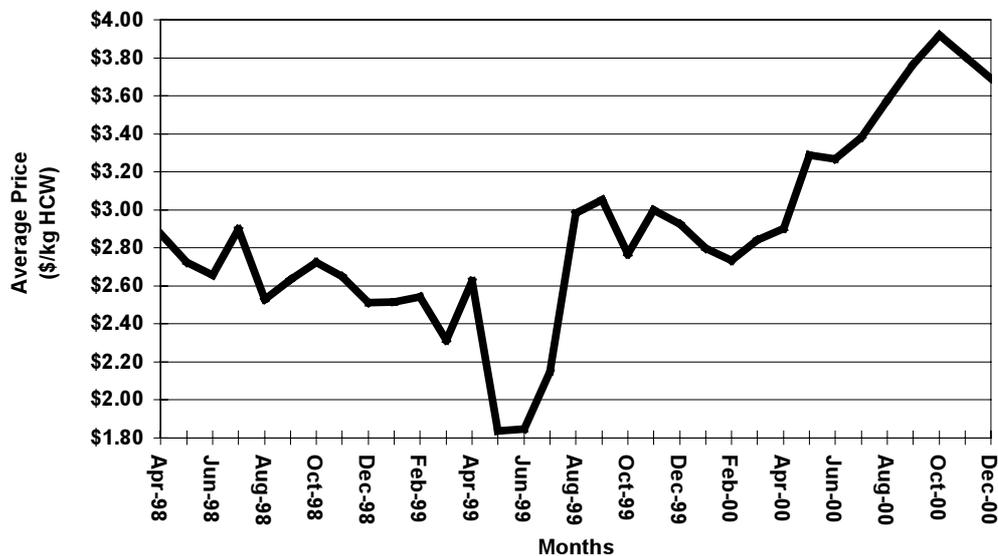
markets, to the extent that demand from these areas exceeds the industry's ability to supply.

The Malaysian market is also reported to have strengthened and there is increasing interest from other Asian neighbours.

The project has seen the development of venison cutting specifications and an internationally recognised carcass grading language.

Other RIRDC market development projects have seen the initiation of specific market contracts for venison and the development of body condition scoring charts to assist farmers and processors improve the average quality of carcasses available for sale. The industry quality assurance program continues to grow and develop with an aim of developing international consumer confidence in products produced by the Australian industry.

**Graph 6 - Average Hot Carcass Weight (HCW) Venison Export Prices [17 & 21] Red Deer**



The graph of changing average venison prices clearly shows the price depression in mid 1998 that resulted from a range of factors that the industry was unable to control and in particular, the revaluation of the Australian dollar that occurred at that time and the depression in Asian economies.

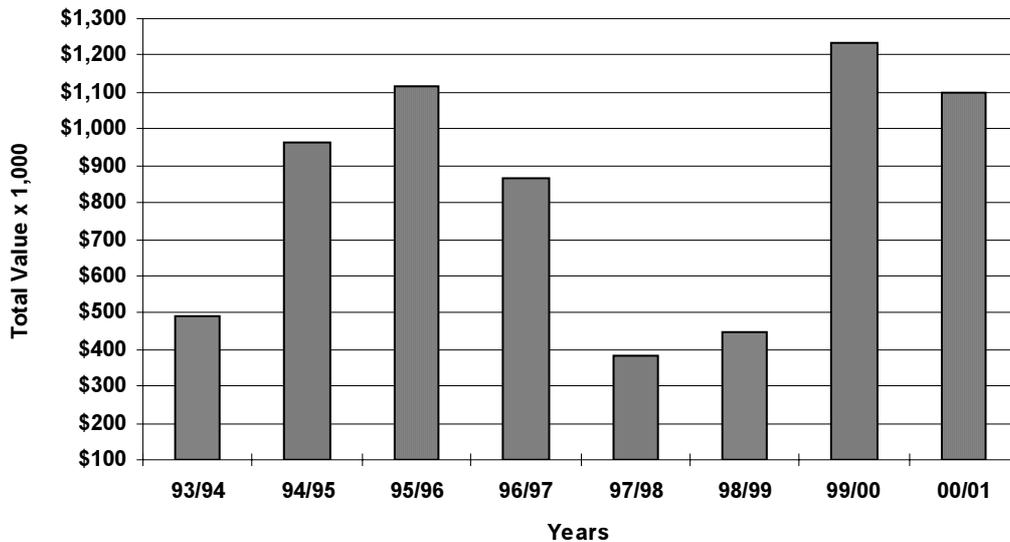
## 4.2 Processing and Marketing Infrastructures

### *Velvet*

The deer industry in association with RIRDC established what is now known as the Australian Deer Horn Company (ADHC). ADHC collects and markets Australian deer horn on behalf of its members.

The company has developed a system of controlled marketing for velvet antler by pooling and grading product prior to sale.

**Graph 7 – Total Value of Velvet sold through the Australian Deer Horn Company [21]**

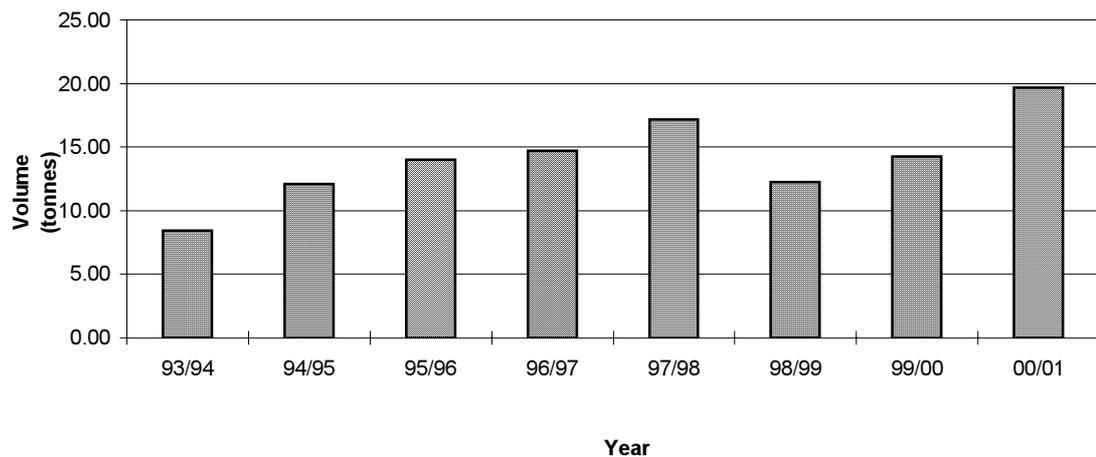


Reasons for pooling and grading the industry's velvet production prior to sale include:

- i) control of the quality of product offered to the market; and
- ii) optimum returns to growers.

There is no compulsion for growers to market their deer antler through the Company but the majority of the industry's velvet is made available to the market via the Company.

**Graph 8 – Volume of Velvet marketed by the Australian Deer Horn Company [21]**



The company also collectively markets industry co-products including sinews, pizzles, tails, skins, blood, etc.

The industry plans and coordinates regular velvet accreditation courses for deer farmers in Australia. Courses train farmers in velveting techniques that aim to ensure optimum welfare

requirements of deer are maintained and to continually improve the quality of velvet produced in Australia.

### **Venison**

Venison prices have shown marked fluctuation over the past 10 years.

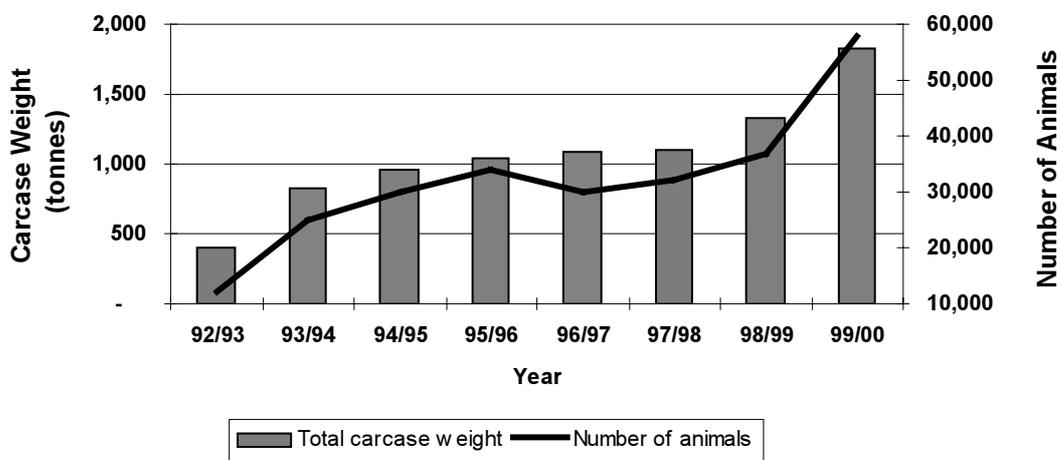
Prices have been affected by simple factors like shortage of supply to meet demand developed by marketing initiatives, and uncontrollable influences like the reunification of Germany and the break up of the Soviet Union.

The reunification of Germany led to a flood of previously restricted feral deer venison into Germany that caused a strong downward pressure on prices.

Currency changes, in particular the weakening of the German currency, generally mean growers in Australia and NZ will receive less for their venison.

Price fluctuations seen in the past are largely symptomatic of a maturing industry and the seasonal pattern of consumption by the biggest consumers of venison in Europe. Despite the obvious fluctuations the general price trend over recent years is upward and generally above the average per kg prices growers received for sheep and cattle.

**Graph 9 – Australian Venison Production [20]**



## **4.3 Transportation of Animals and Products**

The Deer Industry Association of Australia (DIAA) in conjunction with State and Federal Governments and Animal Welfare Groups has devised the Code of Practice for the Transportation of Deer.

Transportation of live deer is undertaken in a similar manner to other livestock although some adaptation of trucks and trailers is necessary.

The Code of Practice not only addresses the welfare requirements of deer to be transported but also considers safety of people involved in transporting and requirements linked to quality assurance of products.

Costs of transporting deer are similar to those experienced by traditional livestock producers and there are carriers in each state that specialise in the transport of deer.

The development of an integrated deer industry quality assurance program will include detailed specification for the transport of deer to ensure consistent quality products are made available to consumers.

## **4.4 Technical Resources**

The deer industry is fortunate to have access to specialist researchers in several Australian universities who concentrate some of their activity on deer research. Their research papers that are published in scientific journals add to the growing international database.

The New Zealand deer industry is generally considered to be at the forefront of international deer research. Veterinary conference proceedings, industry conferences, regular industry publications and traditional scientific literature document their work that is easily accessed by producers and researchers alike.

The Australian Deer Industry Development Manager (DIM) is currently working on the establishment of an industry database that will document technical and scientific data for easy access by those who need it.

RIRDC has long-term involvement in the development of the Australian Deer Industry and in sponsoring research on Industry's behalf. It continues to be a major sponsor of deer research in Australia.

In recent years RIRDC has also supported successful research and development of markets for deer industry products. A result of successful market development projects is that current industry constraints relate to product supply rather than demand.

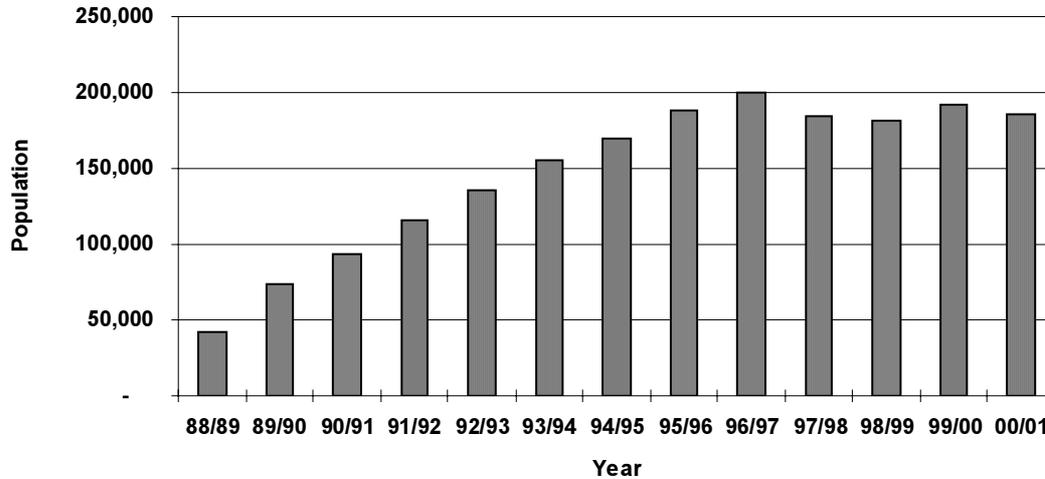
RIRDC and DIAA recognition of the industry's inability to meet market demands led to the appointment of the DIM by the Deer Industry Products and Development Company Ltd. The DIM budget is funded by deer industry levies and RIRDC.

## **4.5 Industry Structures**

The Australian Deer Breeders Federation was formed in 1979. The industry organisation has continued to develop and has evolved into the DIAA. The DIAA represents all sectors of the Australian Industry and members subscribe directly or through state organisations, breed societies or processing associations.

The industry has established two product development and marketing companies, The Australian Deer Horn Company Ltd and The Australian Deer Products and Development Company Ltd.

**Graph 10 - Australian Farmed Deer Population [2 & 20]**



## 4.6 General Considerations

Deer can adapt to most Australian farming environments although some species breed and produce more efficiently in specific environments.

It is worth considering that even within species groups specialisation in some aspects of production can improve profit and production efficiency. For example, breeding may be undertaken in a different environment to finishing animals for processing.

The profitability of any deer enterprise is influenced by many factors and, in particular, costs of fodder conservation and costs and availability of supplementary feeds.

The assessment of relative profitability of alternative deer enterprises or deer enterprises with other forms of agricultural production must be undertaken objectively.

Comparisons should be made on the basis of return per unit area (hectare) as demonstrated in the budgets included in this manual.

## 4.7 Quality Assurance

The Australian deer industry has initiated an industry quality assurance (QA) program for venison and velvet production.

Although programs administered by AQIS that ensure the health status of meat have always been required of registered abattoirs, past health programs have not necessarily focussed on practices that maximise quality of venison produced.

Processors who are developing specialist abattoir facilities for deer are currently addressing this aspect of QA. The facilities will be at least as good as those in New Zealand and with knowledge and experience of New Zealand processors, even better.

Integrated industry QA programs are being put into place for all aspects of deer farming from management, handling, transporting, processing, boning, packaging and marketing.

The programs are similar to the successful New Zealand Deer Industry QA programs.

The industry in association with AUSMEAT has already developed carcass grading and cutting specifications for venison to give customers confidence in product description, quality and price. The Body Condition Scoring charts developed with assistance from RIRDC and designed to assist producers and processors improve the average quality of carcasses offered for sale have further enhanced the specifications.

## 5. Budget Assessment

To be able to objectively assess alternate enterprises there must be a standard basis for comparing the enterprises.

One simple method used to allow objective comparison of agricultural enterprises is Gross Margin (GM) analysis.

Gross margin budgets are not meant to accurately indicate returns or profit from any particular enterprise, but to provide a predictive estimate of outcome from a particular enterprise.

There are no right answers; outcomes are based on individual income, expense and production parameters used for a particular situation. This means though that gross margin budgets can be easily adjusted to reflect anticipated enterprise outcomes for a range of parameters as they apply to different environments or production systems.

This means the usefulness of gross margin budgets is directly related to the accuracy and completeness of the information used in the preparation of the budgets.

However, gross margin budgets take no account of market demand for products produced by an industry. The budgets predict enterprise returns based on the assumption that products will be sold at a given price.

Newer industry budgets, by necessity, are based on subjective estimates of production, expense and income parameters. Deer industry budgets are not based on subjective estimates. All data used in the budgets is objective and determined by practical experience of commercial production.

Individual budgets should be closely scrutinised by users to determine usefulness for their situation and to ensure any comparison between enterprises is valid and based on the same range of production, expense and income parameters.

Only relative outcomes should be compared, as actual outcomes will vary as income, expense and production parameters used in preparing the budgets change to meet individual requirements.

To ensure any comparison of grazing livestock enterprises is meaningful, the grazing pressure exerted on the land used must be the same for each enterprise.

# 6. Grazing Pressure

## 6.1 Animals

The assessment of relative feed requirements of different classes of species of grazing livestock can be difficult. However different species of grazing livestock and different classes of livestock (age, sex, production status) exert different grazing pressure on their environment.

For example a large animal will usually need more feed to maintain its body condition than a small one, although there is not a direct relationship between body weight and maintenance feed requirement. Also a young, fast growing animal will have a higher feed requirement than a mature animal of the same weight.

An animal's daily feed requirement changes during a year as its production status changes. For example a breeding female's energy requirement in early pregnancy is close to a maintenance requirement. During the later stages of pregnancy her feed needs dramatically increase (coinciding with rapid foetal growth) and continues to increase into lactation. About halfway through the lactation her feed requirements begin to decrease towards maintenance requirements at weaning.

## 6.2 DSE Ratings

One way of estimating the feed requirements of different species and classes of livestock is by comparing their feed requirements to a standard feed requirement.

In Australia, a standard feed requirement is considered as the feed energy required by a 45kg live weight merino wether to maintain its live weight. Assuming an average energy density of feed, that feed requirement is 5.8 MJ of energy per day. This feed requirement is described as one dry sheep equivalent (DSE).

In New Zealand the basic feed unit for stock is called a Stock Unit (SU). One SU describes the feed requirement by a 55kg-crossbred ewe producing 1.1 lambs annually (10.9 MJ per day). This brief explanation suggests that one New Zealand Stock unit (SU) is approximately equivalent to 1.9 DSE.

It is important to remember that DSE ratings (estimated feed requirements) are influenced by:

- (i) Live weight
- (ii) Sex
- (iii) Age
- (iv) Production status (growth, pregnancy, lactation, etc)

We can describe an animal's feed requirements in terms of DSE's or energy requirements at each stage of the production cycle.

Although we know that feed requirements change over a production cycle most people tend to rate stock according to an average annual DSE rating.

It is important to remember though that one of the main determinants of feed requirement is live weight.

DSE ratings must be determined for stock held on a particular property taking account of the average live weight of each class of stock on the property.

Feed requirements of deer will be repeated in detail in a later Deer Nutrition module of the manual.

Table 1 provides a comparative guide of DSE rating for breeding females of different species. It assumes average birth weights, growth rates, lactation rates, weaning age, etc for each species.

**Table 1. Guide Comparative Average Annual DSE Ratings**

<b>Species</b>	<b>Live weight</b>	<b>Average Annual DSE Rating</b>
Beef Breeding Cow	500	12.0
Beef Bull	650	14.0
Breeding Ewe	55	1.8
Ram	85	2.0
Fallow Doe	45	1.8
Fallow Buck	95	2.3
Red Hind	100	3.4
Red Stag	160	3.6
Rusa Hind	80	2.8
Rusa Stag	130	3.1
Elk Cow	230	6.3
Elk Bull	400	7.1

## 6.3 Pasture

Experienced stock managers also rate pasture in terms of its estimated carrying capacity (DSE/hectare).

With knowledge of an animal's DSE rating and the estimated carrying capacity of a section of pasture, experienced managers can estimate how many of a particular class of stock can be carried on a section of pasture and for how long.

As deer grazing patterns and their selection of pasture while grazing is different to traditional species some specialised knowledge is needed.

## 6.4 Budgets and DSE's

To allow meaningful comparisons, budgets use average annual DSE ratings for livestock based on average live weights for each class of stock considered.

GM budgets list all sources of income and operating costs for an enterprise and simply subtract operating costs from income to determine an enterprise GM. The GM can then be assessed in terms of GM per hectare or GM per DSE to allow objective comparison between alternative enterprises.

It is important that all variable costs are included in the GM budget. It is all too easy to omit costs because they are considered **only small** and of limited affect on enterprise outcome. It can be surprising how significant the total contribution of small costs can be. They must always be included.

Costs of feed produced on the property and owner's labour must also be included in the budget. All of these items have a real cost to the operation of the enterprise.

A GM budget should always consider a sensitivity assessment. Such assessments provide an opportunity to consider the effect on enterprise outcome of change to significant production and income parameters. They allow for **what if** assessments.

The range of alternative commercial deer enterprises for each species of deer include:

- (i) Self replacing enterprises that produce venison;
- (ii) Self replacing enterprises that produce venison and velvet;
- (iii) Sole enterprises that produce velvet;
- (iv) Enterprises that produce weaners for sale;
- (v) Enterprises that rear weaners to slaughter weight;
- (vi) 'Stud' enterprises that produce elite breeding stock.

[A self-replacing enterprise is one that breeds its own replacement female stock.]

The major species of deer farmed in Australia include: Fallow deer; Red deer; Elk/Wapiti; Rusa and Chital Deer. The alternative enterprise opportunities listed above can be considered for all species.

Other species that are found include Sambar deer. There are also species of fallow deer like Mesopotamian, Danish and Hungarian fallow deer that may provide extra profitability options.

Budgets that consider use of cross breeding programs to increase live weight and live weight gains must recognise that the grazing pressure exerted by larger, faster growing hybrid animals is greater than that exerted by smaller pure bred stock.

The DSE ratings of hybrid stock should reflect the greater live weight of the hybrid stock.

# 7. Comparative Budgets

As previously discussed there can never be a gross margin budget that reflects all situations.

Deer budgets are influenced by factors including:

- Species of deer;
- Production system (paddock feed, feed lotting, irrigated pasture, supplementary feed type and cost, etc);
- Commodities produced (venison or velvet or both);
- Management skills;
- Environment (tropical, temperate, arid, etc);
- Proximity to markets and processing facilities; and
- Carrying capacity of the property (DSE ratings).

Several alternate budgets are presented in the following pages. They only provide a guide to estimated returns for a situation that has similar production, cost and income factors.

It is also important to understand that GM budgets do not take account of fixed or overhead costs that are incurred regardless of whether production takes place.

Each of the Guide Budgets is accompanied by a development budget. The development budget provides an estimate of costs of setting up the enterprise and information on investment returns.

Obviously if any interest, purchase or development costs are different from those used in the guide budgets, outcomes may be different. The development budgets, like GM budgets are intended only as a broad guide.

***People considering investment of new deer enterprise or expansion of existing ones should prepare budgets that more closely reflect their own situation.***

## 8. Budgets Presented

Guide budgets are be compared for:

- (i) A self-replacing red deer enterprise producing venison and velvet;
- (ii) A self-replacing red deer enterprise producing venison;
- (iii) A self-replacing fallow deer enterprise producing venison;
- (iv) A self-replacing rusa deer enterprise producing venison;
- (v) A male red deer herd producing velvet.

Alternative enterprises that could be considered include: breeding herds producing weaners for sale; enterprises that purchase weaners and grow them for slaughter; breeding enterprises that make use of hybrid vigour to maximise venison production (Mesopotamian, Danish & Hungarian fallow, Elk/Wapiti, specialist European red deer genetics); and velveting only herds.

The budgets presented attempt to consider enterprises maintained at a similar stocking density.

Performance that is better than that shown in the budgets may be achieved through cross breeding programs. Growth rates of hybrid animals are often better than purebred stock. This may allow them to reach target slaughter weight at a younger age than purebred stock.

As described above, larger, faster growing animals have a greater feed requirement so grazing pressure (stocking rate or DSE rate) may be increased.

When comparing budgets, investors should consider factors including: time for positive cash flow, peak debt, annual income from the established enterprise, etc.

Two of the major influences in the development budgets are the availability of cash to reduce borrowings and the preparedness (ability) to invest more in initial stock purchases. The more quickly the herd is established, the more quickly returns begin to flow and interest payments are reduced.

## 9. Using the Budgets

It is important to remember that these budgets are only guide budgets and they are based on the income and cost parameters used.

Budgets may be significantly affected by the availability and cost of supplementary feed, the ability and cost of irrigation to produce stock feed, fertiliser costs and management costs of the stock.

Development budgets can be affected by the need to borrow money (how much) and the cost of borrowing the money. The set up costs described show a maximum cost of using new materials.

Establishment costs (fencing, yards etc) can be significantly reduced by using existing fencing and other infrastructures.

***The budgets are only intended as a guide, they need to be amended to meet individual situations.***

Numbers presented in the budgets (i.e. number of replacement sires needed, number of animals weaned etc) are determined by mathematical formulae so at times fractional numbers are presented.

Obviously a fraction of an animal cannot be purchased nor can a fraction of an animal be weaned, these numbers represent an estimated average performance for the herd so data must be considered with that overriding fact in mind. If for example the average number of animals weaned from females mated is 50%, about half of the females do not produce an animal. If the average annual sire replacement requirement is 1.5 sires per year the actual requirement may be one in the first year and two in the second year.

# 10. Interpreting the Budgets

## 10.1 Page 1 of the Budgets

The first page of each budget can be considered a summary page.

The boxes at the top of the page provide:

- i) A summary of the property details, including the number of breeders, the area of the property and the stocking density; and
- ii) A summary of the budget including enterprise gross margin and return on capital invested in livestock.

The remainder of page one summarises income and expenditure for the enterprise.

## 10.2 Pages 2 & 3 of the Budgets

Pages two and three show the background workings to the budget.

### ***Production Data tables***

show physical aspects of the property.

### ***Sales/Culling table***

shows when stock are culled (the percentage sold or culled is the percentage of stock in that age group that are culled in a particular year).

### ***Herd Structure table***

describes the number of animals on the property in each animal sex/age group at mating.

### ***Venison Sales, Live Animal Sales and Velvet Sales tables***

are self-explanatory. The number of animals sold or velveted is determined by reproductive data and culling data entered in production and sales/culling tables.

### ***Fertiliser, Pasture Renovation and Irrigation tables***

allow for management costs for production to be used.

### ***Stock Value and DSE Rating tables***

describe the value of each class of stock and their average live weight. Average live weight data is used to calculate DSE ratings.

### ***Health table***

shows the number of times a particular treatment is undertaken on each class of stock. The cost of each treatment is shown on page 1 of the budget.

### **Hay, Grain and Silage Feeding tables.**

The tables show the value of the supplement used, how much is fed per head per week and for how many weeks the supplement is fed.

Although budgets provide opportunities to include both supplementary feed costs and irrigation costs, where the opportunity for irrigating pastures exists, there is likely to be a trade off between the requirements for supplementary feed and the availability of irrigated pasture.

## **10.3 Pages 4 & 5 of the Budgets**

Pages four and five show two enterprise *sensitivity* (or *what if*) analyses. The first (Sensitivity Table 1) shows how the enterprise gross margin (\$/hectare) would be affected if the average sale price for stock or average velvet price was to change.

*For example:*

In guide budget 1, the bottom line of the graph shows how the GM changes as the venison price changes, while the velvet price stays constant at \$60/kg. The middle line on the graph shows a similar change but the average velvet price is constant at \$75/kg. The top line is again similar but the average velvet price is \$90/kg.

To consider the effect on gross margin of a change in velvet price from \$60/kg to \$75/kg while the venison price is \$3.75/kg, look at the bottom line of the graph and determine the gross margin when average velvet price is \$65 and venison is \$3.75 (\$185/ha) then move up and look at the middle line and make an estimate of the new return per hectare when average velvet price is \$75/kg and venison is \$3.75/kg (\$191/ha).

Sensitivity Table 2 shows how the enterprise gross margin (\$/ha) and stocking density changes as the number of breeding females on the property changes.

The bar graph shows how the GM per hectare changes as the number of breeding females maintained changes. It is read against the right hand axis. The line graph shows how stocking density changes as the number of breeding females maintained changes and it is read on the left axis.

# 11. Investment and Development Budgets

To estimate establishment costs and to consider cash flows and enterprise income during enterprise development, guide development budgets have been developed for each of the enterprises considered.

**Costs used in these budgets are for expensive new fencing. Module 2 of the Deer Industry Manual (Fencing and Handling Yards) provides details of opportunities to significantly reduce establishment costs and improve investment profitability by using existing fences.**

The development budgets assume that an investor has a goal to establish the property described in the gross margin budget. They assume cash availability as described and that the remainder of funds are borrowed at the interest rate shown. **Development budgets do not consider land purchase or fixed overhead costs.**

The development budget nominates:

- i) An initial stock purchase number and their value;
- ii) The age at which stock are purchased;
- iii) The number of paddocks the completed enterprise would require;
- iv) Interest rate charged on bank debit balances;
- v) Interest rate earned on bank credit balances;
- vi) The term of loan borrowings.

The development budget is summarised in table and graphic form. The table shows:

- i) How animal numbers increase and the associated stocking density increases;
- ii) How enterprise cash flow changes (the data does not consider income earned from credit balances);
- iii) Cash balance or overall income;
- iv) Enterprise annual income;
- v) Interest and principal payments for both a development loan and a stock purchase loan. Obviously if less money is borrowed to initiate the enterprise, costs of establishment will be less;
- vi) Cash available for investment is used to reduce the development loan. If the value of the cash investment is greater than the investment required for the development loan, the stock mortgage is also reduced;
- vii) The budgets assume that where enterprise outcome for any year is debit (total expenses including interest payments are greater than income) the value of the debit is added to the stock mortgage (overdraft) account.

The development budget graphs show:

- i) Cash flow for the development. The graphs show two cash flow graphs. One considers cash flow that does not include income earned from credit bank balances. The other does include income earned from credit balances in the bank.
- ii) The cash balance graph shows the enterprise equity.

- iii) The stocking rate graph demonstrates how the stocking rate for the enterprise increases over time.

The last development table shows how the set up costs for the enterprise were determined.

## 12. References

- [1] Barton. D. (2001) '*Boom Time*'. *The Deer Farmer Magazine February/March 2001*, p7.
- [2] Cleak, C (1997) - *Deer Farmer Personal Communication*
- [3] Deer Industry Association of Australia (1995) *The Deer Industry Strategic Plan - Stage 1 report August*
- [4] Deer Industry Association of Australia (1996) *The Deer Industry Strategic Plan - Final Stage report January*
- [5] Dockrill, G (1997) - *Deer Farmer Personal Communication*
- [6] Queensland Department of Primary Industry Internet Web Site (2001) [www.dpi.qld.gov.au](http://www.dpi.qld.gov.au) *Farm Notes - Deer*
- [7] Griffiths, HD (1988) *Fallow Deer Farming in Tasmania, Department of Agriculture, Tasmania*
- [8] McGhie, C (1997) - *Deer Farmer Personal Communication*
- [9] Mackay, B - NSW Agriculture *Deer Farming in NSW, New South Wales Agriculture*
- [10] Mahoney, T (1997) - *Deer Farmer Personal Communication*
- [11] New Zealand Ministry of Agriculture and Fisheries Internet Web Site (2001) [www.maf.gov.nz](http://www.maf.gov.nz) *Primary Industry Statistics*
- [12] New Zealand Game Industry Board (1997) *Personal Communication*
- [13] New Zealand Game Industry Board Internet Web Site (2001) [www.nz.gib.co.nz](http://www.nz.gib.co.nz) *Industry Statistics*
- [14] Rural Industry Research & Development Corporation (1997) *Venison Market Development Program Towards 2000. Compiled by Lynelle Tume. Report No. 97/32*
- [15] Sinclair, S (1997) *Deer Industry Development Working Paper Series No 1. Deer Slaughter and Venison Production in Queensland: Current Status and implications with regard to Export Standard Deer Abattoir Facilities. QLD DPI.*
- [16] The Victorian Deer Farmer's Association Meat and Livestock Council (1995) *Deer Farming Enterprise Selecting Operation and Profitability*
- [17] The Weekly Times Newspaper (1997) *Personal Communication*
- [18] The Editor The Deer Farmer Magazine (2000) '*Steady as she goes*'. *The Deer Farmer Magazine September 2000. p13.*
- [19] Thonard, Dr J (1997) *Personal Communication*
- [20] Tuckwell, C.D. (2001) Australian Deer Industry Development Manager *Personal Communication*
- [21] Walker, D (1997) - *Deer Farmer Personal Communication*

# 13. Attachments - Guide Budgets

Major changes to budgets presented in this second edition of the Deer Industry Investment and Economics Manual are:

- Reduction in the stocking density for the properties used in the guide budgets from about 25 DSE per hectare to about 15 DSE per hectare
- Industry levies for venison and velvet are included at the proposed new industry rates of 3.25% for velvet and \$0.105 per kg hot carcase weight for venison
- An increase in the labour cost for each enterprise
- A reduction in the current average price for venison
- A reduction in the current average price for velvet antler
- The weaning rates used in the budgets have been reduced to better reflect industry averages
- An increase in the enterprise development costs by the addition of funds for a deer crush and scales
- Other minor changes that better reflect industry average input into actual production costs
- To allow a more equitable comparison, the fallow budget presented here does not include irrigation costs as appeared in the first edition of the manual. The availability of irrigation generally increases carrying capacity so all budgets have been prepared assuming not irrigation capability.

## 13.1 Guide Budget 1

A self-replacing red deer herd that produces venison and velvet.

The enterprise maintains a stocking density of almost 15 DSE per hectare on 100 hectares. It manages a herd of 250 breeding females, 6 sires and 100 velveting males.

Live weights reflect a herd of pure red deer genetics and feeding costs do not include any irrigation costs.

The weaning rate for the herd is 80% (i.e. 80% of the females mated have a live calf at weaning) and 3 sires are used per 100 females mated.

Obviously if any of the cost parameters used in the budget change the outcome may be different.

If a cross breeding program using Elk/Wapiti or other specialist genetics is initiated to increase live weight at slaughter the return per animal slaughtered may increase. Any increase in return would need to be offset by potential increases in feed costs.

Use of alternative genetics may also increase average velvet production of males in the velveting herd.

Venison prices used in the income sections of the budget assume that no levy deductions are made from processors receipts. This means a levy expense of \$0.105/kg is included in the enterprises expenses.

Venison prices used reflect prices paid for product process for the export market. Velvet prices used reflect average velvet prices for red deer velvet paid by the Australian Deer Horn Company since the 1993/94 season.

Associated development budgets relate to a situation where the developer is working to establish the herd described in the gross margin budget. The estimated total investment required is \$56,000 for livestock and approximately \$113,450 for infrastructure. No allowance is made for land purchase.

A herd is initiated with the purchase of 250 first year breeders @ \$200 each and 6 sire @ \$1,000 each that will grow to a herd of 250 breeding females and 100 velveting males. An assumption used in the development budgets is that the developer has \$50,000 cash to invest in the project. Obviously changes in the level of initial investment will affect the budget.

A smaller initial purchase may reduce the initial investment, but extend the 'break-even' period for the investment.

## 13.2 Guide Budget 2

A self-replacing red deer herd that only produces venison (it does not maintain a velvetling herd).

Similar to enterprise 1, this enterprise maintains a stocking density of about 15 DSE/ha on 100 hectares.

The number of breeders (325) on the property is greater than in the guide budget 1 because no velvetling males are kept, apart from 8 sires.

Production, cost and income parameters are similar to those used in budget 1, as is the 80% weaning percentage.

This budget may be more influenced by a cross breeding program that maximises venison production and minimises the time from birth to slaughter.

Venison prices used in the income sections of the budget assume that no levy deductions are made from processors receipts. This means a levy expense of \$0.105/kg is included in the enterprises expenses.

Venison prices used reflect prices paid for product process for the export market. Velvet prices used reflect average velvet prices for red deer velvet paid by the Australian Deer Horn Company since the 1993/94 season.

Associated development budgets relate to a situation where the developer is working to establish the herd described in the gross margin budget. The estimated total investment required is \$73,000 for livestock and approximately \$113,450 for infrastructure. No allowance is made for land purchase.

A herd is initiated with the purchase of 325 first year breeders @ \$200 each and 8 sires @ \$1,000 each that will grow to a herd of 325 breeders. An assumption used in the development budgets is that the developer has \$50,000 cash to invest in the project. Obviously changes in the level of initial investment will affect the budget.

A smaller initial purchase may reduce the initial investment, but extend the 'break-even' period for the investment.

### 13.3 Guide Budget 3

A self-replacing fallow deer herd that principally produces venison.

Like Guide Budget 1 and 2, this enterprise maintains a stocking density of about 15 DSE per hectare on 100 hectares. The enterprise maintains a herd of 520 breeding does and 14 sires.

The weaning rate for this herd is 90% and 2.5 sires are used per 100 female breeders at mating.

Live weights indicated are those suggested for average fallow deer whose genetics are pure European.

This enterprise provides hay, silage and grain as part of its supplementary feeding program and also irrigates some pasture.

Use of Danish, Mesopotamian, Hungarian or other fallow genetics may increase average carcass weights and growth rates. As previously discussed a budget that includes growth effects produced by cross breeding needs to take into account likely increases in feed requirements.

Venison prices used in the income sections of the budget assume that no levy deductions are made from processors receipts. This means a levy expense of \$0.105/kg is included in the enterprises expenses.

Venison prices used reflect prices paid for product process for the export market. Velvet prices used reflect average velvet prices for red deer velvet paid by the Australian Deer Horn Company since the 1993/94 season.

Associated development budgets relate to a situation where the developer is working to establish the herd described in the gross margin budget. The estimated total investment required is \$58,500 for livestock and approximately \$113,450 for infrastructure. No allowance is made for land purchase.

A herd is initiated with the purchase of 520 first year breeding does @ \$100 each and 13 sires @ \$500 each that will grow to a herd of 520 breeding females and 14 sires. An assumption used in the development budgets is that the developer has \$50,000 cash to invest in the project. Obviously changes in the level of initial investment will affect the budget.

A smaller initial purchase may reduce the initial investment, but extend the 'break-even' period for the investment.

## 13.4 Guide Budget 4

A self-replacing Rusa deer herd producing venison in Queensland.

*Note: People considering Rusa deer enterprises should consider that their management requirements are a little different to other species. Differences include their ability to thrive on feeds that cattle and other deer do not normally consume, their ability to breed for a longer period of a year than other deer and importantly, their lack of tolerance of cold compared to other species of deer.*

The enterprise maintains a stocking rate of 15 DSE per hectare over 100 hectares and manages a herd of 390 breeding females and 16 sires.

The weaning percentage described for this herd is 90% and sires are kept in the herd for 10 years.

Budgets that consider management and feeding requirements that reduce the time from birth to slaughter may demonstrate improvement in profitability.

This budget shows only very limited supplementary feed for the stock because it assumes the feed is available as paddock feed. The enterprise does not irrigate any pasture.

Like the other guide budgets presented the outcomes are infinitely variable and depend on income, cost and production parameters used. If a rusa deer enterprise is managed in an environment where more supplementary feed is necessary or survival rates are reduced outcomes may be affected.

Venison prices used in the income sections of the budget assume that no levy deductions are made from processors receipts. This means a levy expense of \$0.105/kg is included in the enterprises expenses.

Venison prices used reflect prices paid for product process for the export market. Velvet prices used reflect average velvet prices for red deer velvet paid by the Australian Deer Horn Company since the 1993/94 season.

Associated development budgets relate to a situation where the developer is working to establish the herd described in the gross margin budget. The estimated total investment required is \$86,100 for livestock and approximately \$113,450 for infrastructure. No allowance is made for land purchase.

A herd is initiated with the purchase of 390 yearling females @ \$200 each and 16 sires @ \$750 each that will grow to a herd of 390 breeding females and 16 sires. An assumption used in the development budgets is that the developer has \$50,000 cash to invest in the project. Obviously changes in the level of initial investment will affect the budget.

A smaller initial purchase may reduce the initial investment, but extend the 'break-even' period for the investment.

## 13.5 Guide Budget 5

A male red deer herd producing velvet. The only venison this herd produces is from its cull animals.

The enterprise maintains a stocking density of almost 15 DSE/hectare on 100 acres. It manages a herd of 450 velveting males.

Live weights reflect a herd of pure red deer genetics.

A replacement purchase program that sources Red deer or Elk/Wapiti genetics may, with appropriate management, increase velvet production and increase profitability.

Velvet prices and velvet production figures used in this budget are greater than those used in other red deer budgets. The increase reflects an assumption that specialist velvet producers will produce more velvet per animal and the velvet will be of better quality.

Associated development budgets relate to a situation where the developer is working to establish the herd described in the gross margin budget. The estimated total investment required is \$157,500 for livestock and approximately \$113,450 for infrastructure. No allowance is made for land purchase.

A herd is initiated with the purchase of 450 males @ \$350 each.

An assumption used in the development budgets is that the developer has \$50,000 cash to invest in the project. Obviously changes in the level of initial investment will affect the budget.

A smaller initial purchase may reduce the initial investment, but extend the 'break-even' period for the investment.

Although the estimated return per hectare for this budget is greater than for other budgets presented in this manual, development graphs show that the time for establishment is longer and the peak debt is greater than in other budgets.