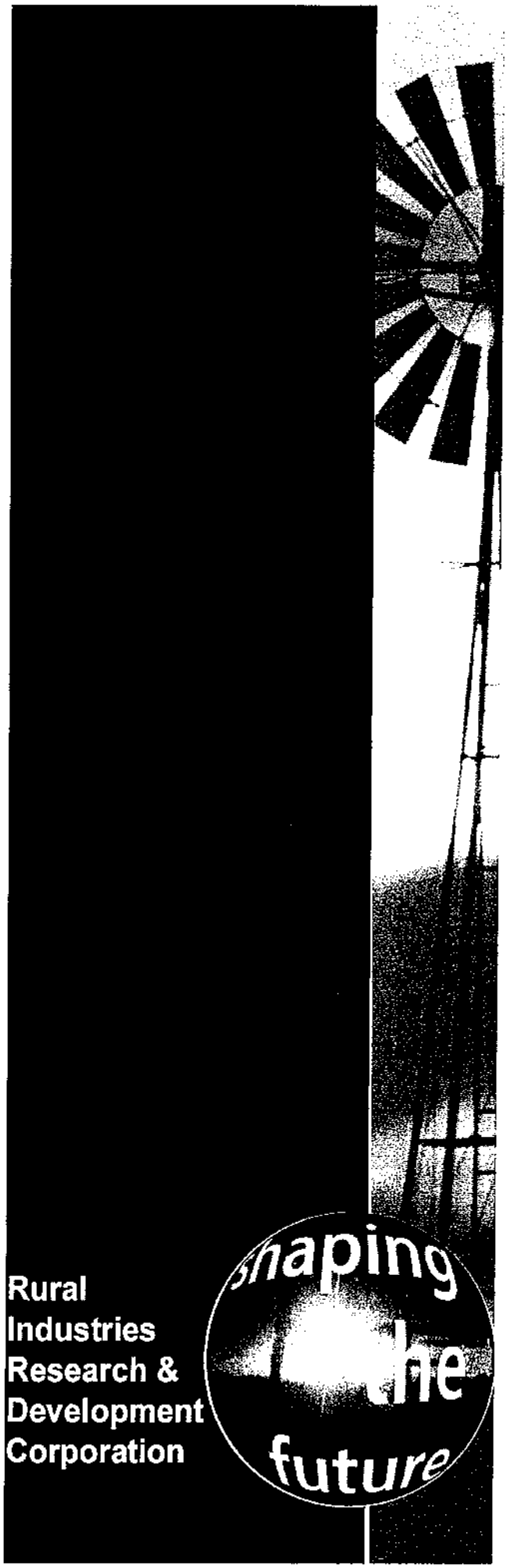

RURAL INDUSTRIES RESEARCH
& DEVELOPMENT CORPORATION

Completed Projects in 2000 - 2001 and
Research in Progress as at June 2001

Sub-Program 2.3

DEER

July 2001

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RIRDC Deer Research Manager
Mr Peter Core
RIRDC
Level 1, AMA House
42 Macquarie Street
BARTON ACT 2600
PO Box 4776
KINGSTON ACT 2604

Phone: 02 6272 5920
Fax: 02 6272 5877
Email: peterc@rirdc.gov.au

RIRDC Publications Manager
Rural Industries Research and Development Corporation
Level 1, AMA House
42 Macquarie Street
BARTON ACT 2600
PO Box 4776
KINGSTON ACT 2604

Phone: 02 6272 3186
Fax: 02 6272 5877
Email: cecilef@rirdc.gov.au
Website: http://www.rirdc.gov.au

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Foreword

This year RIRDC has produced *Research in Progress, June 2001*, which contains short summaries of continuing projects as well as those that were completed during 2000 - 2001 for all of the Corporation's 20 program areas.

The complete report on all the programs is only available in electronic format on our website at http://www.rirdc.gov.au

The following report is a hardcopy extract covering sub-program 2.3 . It contains all entries from continuing and completed Deer research projects funded by RIRDC – Deer. This program aims to foster an Australian deer industry as a highly profitable and efficient mainstream agricultural enterprise.

This report is the newest addition to our extensive catalogue of almost 700 research reports, videos and CD-Roms of projects supported by RIRDC. Please contact us for the latest publications catalogue or view it on our website.

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Peter Core
Managing Director
Rural Industries Research and Development Corporation

Contents

2.3 DEER
COMPLETED PROJECTS

Project Title	Development of domestic markets for value added Australian Velvet Antler and Deer Co Products Part A

RIRDC Project No.: BII-1A
Researcher: Chris Tuckwell
Organisation: Rural Industry Developments
PO Box 1105
GAWLER EAST SA 5118
Phone: 08 8523 3500
Fax: 08 8523 3301
Email: cdtuckwell@bigpond.com

Objectives

To improve returns to Australian deer farmers by target development of niche markets for venison co-products and value added velvet antler products.

- Research and document ideal processing, packaging and handling technologies for Australian fallow deer velvet antler and venison co-products.
- Research market specification and likely demand from selected International and Australian domestic markets for value added deer antler and co-products.
- Develop and document sales strategies that will maximise domestic Australian market acceptability an availability for Australian deer industry co-products.

Background

One of the major reasons for the consistently greater returns realised by New Zealand farmers from animals sold for slaughter is that New Zealand marketers have created ongoing, profitable demand for co products collected during animal processing. In the past, the many processors of Australian deer have been unable to separately market their small volumes of co products. The recent rationalisation of the deer processing industry means a few processors will have access to volumes of co products that are commercially saleable. Improvement in the value of co products sourced from red deer and the creation of value for co products available from fallow and rusa deer will significantly improve returns to Australian deer farmers.

Previously unachievable profits (from co product and value added sales) can be passed directly back to all deer producers while previously unrealised profits from the sale of fallow velvet antler and improved returns from the sale of value added velvet antler products can only improve deer farmer returns.

Research

Two international companies in New Zealand that process significant volumes of deer antler for international and New Zealand's domestic market were visited to source information processing and packaging techniques for velvet antler and co products that can be adopted for Australian product destined for Australian domestic markets.

A guide for market requirements including specific harvesting, processing, packaging and presentation requirements for fallow deer velvet antler were determined in consultation with consumers
With help of existing business contacts and the Australian Tourism Export Council contact was made into potential clients to investigate their interest and determine specific product, processing, cutting, packaging and presentation requirements. This phase of the project investigated potential product demand patterns and volumes and involved travel to personally meet with potential clients. During visits to these markets, evaluation of competition, particularly from New Zealand product will be undertaken to establish their product positioning strategies and any branding success.

Outcomes

Estimates of average consumption of value added velvet antler and venison co products by Asian tourists to New Zealand transposed to estimates of the number of inbound Asian tourists to Australia, suggest that the potential demand for these products could be significant. New Zealand estimates suggest approximately 10% of all venison co products produced in New Zealand are sold to tourists. If 75% of are sold to tourists from China, Korea, Hong Kong, Taiwan and Singapore, estimated volumes of venison co products sold to these tourists approximately equates to the volume of co products available from 30, 00(red deer.

Other information that continues to be generated, both anecdotal and scientifically researched, on the value of velvet antler and venison co products in treating animal ailments demonstrate the apparent opportunity to enter and develop these markets for the benefit of animals treated and the commercial expansion of the Australian Deer industry Our investigation of Australian tourist markets, in particular health food shops and Asian herbalist shops, suggests that this market sector's knowledge of the Australian deer industry generally and the availability of deer co-products specifically, is almost nonexistent.

There are some commercial outlets serviced by Australian companies that have limited knowledge of the Australian industry. However there has been little or no commercial development of these markets and the only promotional material available to retailers is that produced by New Zealand.

Implications

The apparent market opportunities for value added velvet and venison co products are obvious from the information contained in this report.

Given the massive spending on pet foods by people in Europe, North America and Australia and owners willingness to ensure that animals are properly cared for the market opportunities apparently offered by this sector appear significant.

Infra structures associated with production and marketing of deer co-products in New Zealand suggests that the most commercially effective method of marketing products to clients is via specialised retailers rather than through existing health food and herbalists businesses.
The market is potentially too large and the Australian deer industry too small for more than one or two players. If more than one or two players enter the market all player will not be able to confidently source reliable quantities of consistent quality product and continually offer commercially acceptable quantities of product for sale.

It is important for the Australian industry to begin development of these markets immediately and probably in cooperation with New Zealand business in an attempt to create supply channels that can meet the potential demand for products and minimise unnecessary trans-Tasman competition

Project Title:	Development of Niche European Venison Market Opportunities

RIRDC Project No.: DAI-2A
Researcher: Mr Chris Tuckwell
Organisation: Rural Industry Developments
PO Box 1105
Gawler, SA 5118
Phone: (08) 8523 3500
Fax: (08) 8523 3301
Email: cdtuckwell@bigpond.com

Objectives

Development of identified potential industry clients by:

- The negotiation of agreements to ensure clients only source products from DIAA approved suppliers.
- The determination of client product specifications
- The identification of suppliers who are prepared to service the clients on behalf of the DIAA and according to strict quality and specification standards.
- Assistance with the development of strategic alliances between producers and the selected marketers.
- Development of mutually acceptable contractual arrangements (particularly related to quality and availability of stock for slaughter) between producers and marketer.
- The encouragement of producers to adopt the industry QA program and to seek accreditation by it.

Background

The Australian deer industry's lack of competitive advantage in influential markets coupled with the Asian currency downturn, the revaluation of the Australian dollar relative to the German Mark and the within industry processing/marketing competition combined to create a considerable decline in farm gate returns from mid 1997. The decline in farm gate returns saw an increasing number of producers leave the industry. To assist the industry's survival, encourage it to grow and provide producers with an ability to realise profitable returns the DIAA undertook research to investigate and encourage the development a long-term relationship with a European partner, based on a branded Australian product, firm supply agreements, guaranteed supply of quality assured product, scheduled delivery dates, firm year round price and an open book financial relationship. Development of stable, long-term demand for the guarantee of supply of consistent quality product will increase returns to producers. In turn, improvement in producer returns and forecast stability of the returns will attract new participants to the industry and encourage existing producers to expand their production.

Research

The project assisted the initial negotiation of commercial, potentially long-term venison marketing business relationships between Australian deer farmers and a European venison marketer. At the end of this project an initial shipment had been made and negotiation of a second shipment was almost complete. The European client identified by the project indicated their interest in obtaining venison from the Australian industry during periods of traditional annual demand downturns. Provided negotiations with the selected European partner continue to develop and reach a satisfactory end point, this market outlet will contribute to the stability of demand and price for Australian quality assured product across normal supply cycles. However, the ongoing development of this commercial opportunity and establishment of mutually acceptable business relationships must be undertaken directly between the project partners and in a commercial environment.

Outcomes

Objective development of domestic market opportunities and control of supply to those markets that ensures consistent availability of quality assured products should improve returns to farmers and rebuild domestic consumer confidence in the Australian deer industry. If the industry is unable to quickly develop market outlets for its products that give price confidence to its farmers, its immediate future is in doubt. Information gathered by the project has also demonstrated that clients do exist who are willing to purchase venison directly from international suppliers rather that through traditional importers. These importers suggest that they are concerned about the dominance of venison importing by traditional venison importers and the obvious control that the dominance imposes over their own businesses.

Implications

Industry managed projects similar to this project that aim to investigate and develop 'niche' domestic market opportunities for Australian venison based on regular supply of quality assured product appears to offer new market opportunities for the Australian industry. The ongoing development of opportunities identified by this project should give farmers improved confidence in the availability and accessibility of new markets and subsequently encourage confidence to investing in the Australian deer industry's future. Farmer contracts that result from this project will encourage adoption of the industry quality assurance program by rewarding those who produce to specifications and penalise those who do not.

Project Title:	Venison Quality Assurance

RIRDC Project No.: DIP-3A (Part B)
Researcher: Mr Chris Tuckwell
Organisation: Rural Industry Developments
PO Box 1105
Gawler, SA 5118
Phone: (08) 8523 3500
Fax: (08) 8523 3301
Email: cdtuckwell@bigpond.com

Objectives

- To review, and update the Deer industry Quality Assurance program by updating manuals, and the industry code of practice.

Background

The project sought to improve quality of venison available to markets by upgrading the industry QA programs in line with international standards and to encourage greater participation in the programs by simplifying data recoding, storage and reporting.

Research

The project undertook to: (i) initiate development and coordination of industry serving to the markets on a basis of supplying any Quality Assured product while controlling growth of demand to ensure that contracted demand does not exceed ability to supply, (ii) review and update all industry QA manuals, with particular emphasis on the inclusion of HACCP sections in each manual, (iii) develop a computer database program that will allow those who participate in the industry farm and transport QA programs to easily record, store and report on all information required by accredited to be maintained by businesses accredited by the program and, (iv) update and rewrite the Deer Industry Code of Practice.

Outcomes

Available for dissemination and use by industry and its partners where appropriate are: (i) updated Deer Farm Best Practice Manuals, Deer Transport Best Practice Manuals and Venison Processors Best Practice Manuals, each now include appropriate HACCP sections (ii) a computer database program (Deer QAMA) that will easily record, store and report on all information required to be maintained by all businesses accredited by the Deer Industry QA program and (iii) a new Deer Industry Code of Practice.

Implications

The Australian Deer Industry's QA program is designed and planned to help guarantee market access for industry products. Increasingly international and domestic markets for all manner of products and services expect suppliers to take full responsibility for the goods or services they supply.

To be credible and accepted by the marketplace as a reasonable guarantee of food safety and commitments to animal welfare, QA programs must be open to regular audit by both program administrators and the market place.

Through the updating of the Industry QA manuals, the production of the Deer QAMA program and the amendment of the Deer Industry Code of Practice, this project helps provide credibility and audibility of the Australian Deer industry QA programs that is required by the marketplace.

Project Title:	Nutritional Requirements and Growth Characteristics of Pregnant And Lactating Red And Fallow Deer

RIRDC Project No.: UWS-16A
Researcher: Associate Professor Robert Mulley
Organisation: University of Western Sydney,
Hawkesbury Campus
RICHMOND NSW 2753
Phone: (02) 45 701438
Fax: (02) 45 70 1383
Email: r.mulley@uws.edu.au

Objectives

- To determine the daily energy intake requirements of pregnant and lactating red and fallow deer.
- To develop a body condition scoring chart for fallow deer, and examine the relationship between body condition and reproductive performance.

Background

Meat production systems are based around care and maintenance of breeding females. There was no information on the daily feeding requirements of pregnant and lactating fallow and red deer, and these 2 species make up over 90% of farmed deer in Australia. Precise feeding of breeding stock is fundamental to successful reproductive performance, and to produce carcasses of high quality. The only previous estimates for daily energy requirements of female red and fallow deer were interpolated from work done on red deer stags in the South island of New Zealand. These data were acknowledged by RIRDC as being inadequate at a deer nutrition forum in Melbourne in 1997, which led to the current study.

Research

The experimental approach involved extensive analysis and review of information on the nutritional requirements for pregnancy and lactation in other livestock species. A series of trials on daily feed intake in individually housed red deer hinds and fallow deer does was then carried out, in parallel with pasture-fed controls. Deer in pens were fed concentrate feeds of known energy and protein levels. Patterns of daily feed intake were measured throughout pregnancy and lactation in fallow deer and throughout trimester 3 in red deer. A body condition scoring (BCS) chart was developed for fallow deer, and this was used in conjunction with BCS descriptors previously developed for red deer, to examine the relationship between BCS and reproductive success. Examination of diurnal feeding patterns of deer, and feed intake of fallow deer fawns from weaning to 20 weeks of age also formed part of the research.

Outcomes

Information on the daily metabolisable energy intake (MEI) of fallow deer does during pregnancy and lactation is now available. Daily requirements are higher than previously estimated for fallow deer, and vary seasonally. Diurnal feeding patterns were largely crepuscular, although feed intake also occurred around mid-night and mid-day for most animals. Feed intake requirements in early lactation were double those for trimesters 1 and 2 of pregnancy. An annual guide to feeding was developed. Fallow deer fawns consume "hard feed" from 7 weeks of age and require the same daily feed intake as non-pregnant adult does from 16 weeks of age, to maintain growth and development.

The daily MEI data show that hinds can offset reduced feed intake by mobilisation of body reserves with little or no impact on foetal growth. However, reduced daily feed intake for prolonged periods increased the length of gestation. BCS was shown to be an important indication of reproductive success, and is a more useful measure of animal well being and carcass quality than weight.

Implications

Precise strategic feeding of red and fallow deer breeding stock is now possible which should lead to more consistent reproductive performance and higher quality slaughter animals. Furthermore, use of strategic feeding in conjunction with BCS systems for both species will lead to better resource management and profitability, as farmers consistently produce to specification.

2.3 DEER
RESEARCH IN PROGRESS

Project Title	Quality assurance, strategic alliances and industry development

RIRDC Project No.: DIP-4A
Start Date: 01/07/99
Finish Date: 30/06/01
Researcher: Mr. Chris Tuckwell
Organisation: Deer Industry Projects & Developments Pty Ltd
PO Box 1105
GAWLER SA 5118
Phone: (08) 8523 3500
Fax: (08) 8523 3301
Email: cdtuckwell@bigpond.com

Objectives

- To develop and implement strategies that will consolidate and expand production of Australian deer products and position the Australian Deer industry as a commercial livestock industry that compliments Australia's traditional livestock industries.

Current Progress

The project has met its broad milestone commitments throughout the year. However there has been little expansion of the industry's QA programs. Although some long-term industry members are still strongly opposed to concepts of QA recent events I Europe are being used to encourage industry support for the programs. However until international consumers demand certification of quality assurance from venison marketers, adoption of the program will continue to occur only slowly.

Although the ACCC has not yet formally approved industry applications quality assurance brand marks for: farms, deer transporters, venison and velvet antler for registration, the trade marks can be used now with an understanding that any amendments to documentation required by ACCC will be made promptly.

Industry statistics show a decline in the number of deer processed (22% to February) for corresponding periods last season while farmer returns per kg carcase weight continue to climb. The average carcase weight of deer processed has improves and is reflected by the volume of venison processed to February 2001 the same as for the previous year. Concern still exists that current demand grow is greater than industry's continued ability to supply.

New software (Venstat) to encourage a standardized approach to: (i) data recording; (ii) reporting of processing information to individual growers and; (iii) reporting summaries for industry, is almost complete. When complete processors will be trained in its use

Project Title	Defining energy and protein requirements of fallow deer under a Mediterranean environment

RIRDC Project No.:	SAR - 21A
Start Date:	1/07/99
Finish Date:	30/06/02
Researcher:	Dr. Yingjun Ru
Organisation:	South Australian Research and Development Institute
Phone:	(08) 8303 7787
Fax:	(08) 8303 7977
Email:	ru.yingjun@saugov.sa.gov.au

Objectives

- To monitor seasonal nutrient intake by deer under grazing conditions.
- To determine energy and protein requirements of fallow deer under a Mediterranean environment.
- To develop strategies for supplementary feeding during summer and winter.
- To improve liveweight gain or reduce the time taken to reach target finishing liveweight by using cost-effective diet formulations based on the nutrient requirement of deer and nutritive value of feed ingredients.
- To disseminate research outcomes to deer farmers by the ALFI database, seminars, workshop and scientific publications.
- To improve deer farmers profitability by feeding more nutritionally sound diets.

Current Progress

Forage intake trial (2000)

Sixty fallow deer (weaners) were selected and divided into three equal mixed sex groups and supplemented at three levels respectively (300g, 600g and 900 g/day/head). Supplementary feeding was terminated for high and medium treatments in early August and for the low group in June. The supplementary diet contained 12.97MJ DE and 168.8 g protein per kg. The actual supplement intake were not different between the high and medium groups although the high group were fed *ad libitum*. The growth rates were 10, 14, 8 g/day in May; 57, 60, and 32 g/day in June for high, medium and low groups, respectively. There was no difference in growth rate in July and August between treatments, but the low feeding group tended to have a high growth rate in September and October. Males grew faster than females. Detailed forage intake and nutrient requirement will be reported in November 2001

Nutrient requirement trial (2001)

Sixty fallow deer (weaner) were allocated into six groups with three groups of 10 deer for each sex. Deer were supplemented with a formulated concentrated diet at three feeding levels (high, medium and low) to validate the results obtained from forage intake trial (2000). This experiment is under way.

Supplementary feeding trial

Sixty fallow deer (weaners) were divided into three groups in April and supplemented with three different experimental diets formulated according to the results from forage intake trial (2000). The three diets are based on triticale, oats and oats-lupin. The growth rate is being monitored monthly.

Project Title	Determining the tolerance of red and fallow deer to salt

RIRDC Project No.: SAR - 26A
Start Date: 1/07/00
Finish Date: 30/06/02
Researcher: Dr. Yingjun Ru
Organisation: South Australian Research and Development Institute
Phone: (08) 8303 7787
Fax: (08) 8303 7977
Email: ru.yingjun@saugov.sa.gov.au

Objectives

- To examine the effect of salt intake in drinking water and feed on feed intake and growth rate of fallow and red deer under grazing conditions.
- To disseminate research outcomes to deer farmers by field days, fact sheets, seminars, workshops and scientific publication.
- To improve profitability and sustainability of the deer industry.

Current Progress

10 group pens were established on the Roseworthy Deer Farm. In each pen, a water trough and water tank were provided to measure water intake .

Two experiments are under way. For fallow deer, a total 30 weaners were divided into five groups based on body weight and fed on pure lucerne chaff for 3 weeks before feeding the experimental diets. From week 4, five groups of fallow deer were fed on lucerne chaff with salt content of 0, 1.5, 3.0, 4.5 and 6.0% respectively. For red deer, 18 deer were divided into three groups based on their body weight and fed on pure lucerne chaff for 3 weeks before feeding experimental diets. From week 4, the three groups of red deer were fed on lucerne chaff with salt content of 1.5, 3.0 and 6.0%, respectively. Feed intake, water intake, growth rate and blood osmotic pressure and mineral concentrations are being measured. Animals are monitored daily for abnormal performance.

Project Title	Overcoming summer/autumn nutritoinal constraints to deer production in Southern Australia

RIRDC Project No.: UA-46A
Start Date: 1/07/98
Finish Date: 30/06/01
Researcher: Dr Dean Revell / Dr Philip Tow
Organisation: Adelaide University
Department of Animal Science / Department of Agronomy and Farming Systems
Roseworthy Campus
ROSEWORTHY SA 5371
Phone: (08) 8303 7911 / (08) 8303 7857
Fax: (08) 8303 7979 / (08) 8303 7979
Email: dean.revell@adelaide.edu.au / philip.tow@adelaide.edu.au

Objectives

- Provision of cost-effective strategies for nutrition of weaner deer in dryland farming regions of southern Australia that will reduce nutritional stress in the dry autumn post-weaning period and maintain high growth rates.
- Through dissemination of research results, improve deer production and foster expansion of the deer industry into dryland farming systems.

Current Progress

Fallow deer were weaned in late March 2000 and fed a barley/lupin mixture (60:40), barley grain, medic hay or standing lucerne for 80 days. There were no significant differences between treatment groups in live weight at the end of the supplementary feeding period, although male weaners were about 3 kg heavier than their female counterparts. All animals were then moved onto high quality medic pasture (with no supplements) and, after a further 120 days, the differences in live weight between sexes had increased to about 9 kg. There were minimal effects of the different post-weaning supplementary feeds on live weight by early November, such that animals that had been weaned onto lucerne were of similar final weight to those that had been weaned onto grain. Potential advantages of weaning onto lucerne were a reduction in the time taken for animals to begin gaining weight (3 vs 5 weeks) immediately after weaning, and avoidance of a growth-check when moved onto lush pasture in mid-winter. However, deer that had been weaned onto grain were able to overcome these temporary set-backs by gaining slightly more bodyweight when grazing high-quality spring pasture.

Project Title	Drought feeding - Early weaning strategies

RIRDC Project No.: UQ-78A
Start Date: 1/07/98
Finish Date: 31/12/01
Researcher: Dr. Gordon Dryden
Organisation: The University of Queensland
School of Animal Studies
Gatton Campus
GATTON QLD 4345
Phone: 07-5460 1255
Fax: 07-54601444
Email: GMD@sas.uq.edu.au

Objectives

To improve the ability of deer farmers to control growth and survival of young deer by investigating the feasibility and effects of weaning at various ages and advising practicable early-weaning strategies by 2000.

Current Progress

Red deer calves were weaned at 7 and 9 weeks. They were given, *ad lib.*, a good quality lucerne hay, and a pelleted concentrate. Animals of both ages grew at approximately the same rate, but the younger calves were smaller at the end of the experiment in March (40.2 v. 46.1; P=0.023), but not after 9 months of grazing (at 27 December, 1999). For details see reference cited below. Weaning at 7 weeks is feasible, although these calves will be smaller than normal for several months. Chemical analyses to determine rates of passage and food constituent digestibility are in progress. The feasibility and effects of weaning at 7 and 9 weeks data were reported at the 2000 meeting of the Nutrition Society of Australia (Proceedings of the Nutrition Society of Australia, 24: 257).

Deer Industry Manual

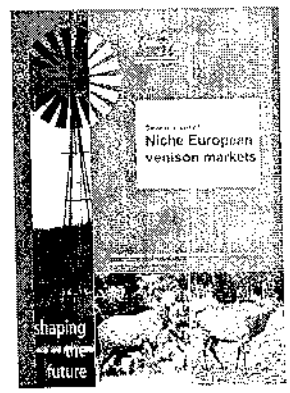
$50 set of 7

Series of seven publications that collectively make up the Australian Deer Industry Manual. Each focuses on a particular aspect of the industry.
Can also be purchased individually.

- **Investment and Economics - No 1** (2nd ed)
  (2001, 72pp, Pub No 01//058, $20)
- **Fencing and Handling Yards - No 2**
  (1998, 54pp, Pub No 98/013, $20)
- **Classification and Species Selection - No 3**
  (1998, 32pp, Pub No 98/028, $15)
- **Deer Health - No 4**
  (1998, 26pp, Pub No 98/029, $10)
- **Deer Velvet Antler - No 5**
  (1998, 16pp, Pub No 98/030, $10)
- **Pasture Assessment and Grazing Management - No 6**
  (1998, 48pp, Pub No 98/051, $10)
- **Commercial Management Guide - No 7**
  (1998, 52pp, Pub No 98/058, $10)

Deer Antler – Velvet Research in Australia and Overseas

by D Walker, D White, R Roubin
Presents reports on international symposiums in Canada and Thailand during 2000. The Canadian symposium provided strong support to the growing acceptance that deer antler cartilage is a substance with significant future medical application potential. The Thailand congress demonstrated that patients consuming velvet antler capsules showed no side effects to the velvet antler but did provide symptomatic relief in Osteoarthritis disease
2001, 60pp, Pub No 01/030
$10



Development of Niche European Venison Markets

by C Tuckwell
Investigates new distribution channels for Australian venison products in Europe and new methods of marketing venison in Europe. Also considers some of the features of group marketing together with general features of membership groups and how they influence the effectiveness of collaborative marketing groups.
2000, 26pp, Pub No 00/172
$10

Eating Qualities of Venison from Red and Fallow Deer

by F Shaw
Evaluates the eating quality of venison from red and fallow deer produced under best practice commercial conditions. Evaluation was carried out using machine (Warner-Bratzler shear force measurements) and subjective (trained taste panel) measurements. The knowledge gained from this project will be of value if the venison industry wishes to establish a 'pathway' system for the production of venison of 'guaranteed' tenderness
2000, 25pp, Pub No 00/49
$10

Development of the Deer Industry as a Major Australian Livestock Industry

by C Tuckwell
Provides a detailed account of the Australian deer industry and of the program to provide the basis for industry expansion. Examines in detail the difficulties in achieving the industry growth hoped for including currency exchange rates, international competition and within industry marketing and processing competition. Highlights those areas considered vital to industry growth and even survival.
1999, 88pp, Pub No 99/092
$10

Ecchymosis – What Causes It?

by R Mulley & D Falepau
Investigates the factors which cause ecchymosis (blood splash) in deer and proposes a set of slaughter procedures. Also puts forward recommendations for industry consideration.
1999, 150pp, Pub No 99/048
$15
Short Report No 62, free

Deer Newsletter

A RIRDC Newsletter, free

Includes information on current research projects, funding priorities, new publications, industry levy, venison prices. Issued quarterly, 4pp.

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Additional reading

Adding Value to Venison Forequarters and Trimmings	*(98/102, 1998, 62pgs, $15)*
Deer in Queensland - A Decision Support System	*(00/019, 2000, 44pgs, $10)*
Deer Marketing & Production Study	*(91/001, 1991, 218pgs, $15)*
Deer Research in Progress and Completed Projects – June 2000	*free*
Domestic Marketing of Deer By-Products in Australia	*(94/004, 1994, 80pgs, $10)*
Ecchymosis (Blood Splash) in Deer Carcasses	*(00/069, 2000, 10pgs, $10)*
Exporting Venison to Israel	*(99/058, 1999, 13pgs, $10)*
Salt Intake and Red and Fallow Deer A Literature Review	*(00/108, 2000, 20pgs, $10)*
Improving the Marketability of Deer Velvet & Co-products	*(97/028, 1997, 96pgs, $10)*
Maintaining Year-Round Production of Quality Venison	*(98/001, 1998, 87pgs, $10)*
Manufacturer's Guide to Venison Forequarter	*(96/008, 1996, 121pgs, $25)*
Niche Markets for Venison	*(00/118, 2000, 19pgs, $10)*
Nutritional Requirements for Pregnat and Lactating Red and Yellow Fallor Deer	*(01/095, 2001, 138pgs, $20)*
Processing of Deer & Other Farmed Game	*(95/002, 1995, 37pgs, $10)*
Venison Market Development Towards 2000	*(97/032, 1997, 70pgs, $25)*
R&D Plan for the Deer Industry Program 2000–2005	*free*
Second World Deer Farming Congress	*(98/100, 1998, 35pgs, $10)*
Venison Market Development Plan	*(92/006, 1992, 110pgs, $10)*

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I am paying by

cheque (attached, payable to RIRDC)

credit card (below)

Overseas orders in $A only, payable by credit card or bankdraft

Please note we do not invoice

Credit card details

Bankcard | Mastercard | Visa | Amex

Number

Name on card

Expiry date

Signature

This catalogue is regularly updated on our website: ***www.rirdc.gov.au/eshop***