



Completed Projects in 1999-2000 and
Research in Progress as at June 2000

Sub-Program 2.3

DEER

Rural
Industries
Research &
Development
Corporation



July 2000

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Publication No 00/82*

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Foreword

This year RIRDC has produced *Research in Progress, June 2000*, which contains short summaries of continuing projects as well as those that were completed during 1999-2000 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 500 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.

- research report downloads at www.rirdc.gov.au/eshop
- purchases at www.rirdc.gov.au/pub/cat/contents.html

Peter Core

Managing Director

Rural Industries Research and Development Corporation

Contents

2.3 DEER COMPLETED PROJECTS

PROJECT No	PROJECT TITLE	RESEARCHER	PHONE	ORGANISATION	PAGE No
BRN-1A	The influence of pre slaughter conditions on the occurrence of ecchymosis (blood splash) and high Ph	Kevin Barnes	08 8388 4205	Kevin Barnes	1
DIA-1A	Venison Market Development in Europe	Rudolf Keller	02 6657 2088	Deer Industry Association of Australia	2
DIP-2A	Venison Carcass Specifications Manual	Chris Tuckwell	08 8523 3500	Deer Industry Company	4
DAQ-246A	Decision support system for managing red and Rusa deer in Queensland	Stephen Sinclair	07 3280 1905	Department of Primary Industries – Queensland	6
FSA-1A	Eating qualities of venison from red and fallow deer	Frank Shaw	07 3214 2001	Food Science Australia	8
HES-1A	Domestic Venison Marketing: A Test Case	Daryl Heslop	02 4998 1576	Daryl Heslop	9
OVH-1A	A study of reproductive performance and pre weaning mortality in farmed red deer in Australia	Andrew Hansen	02 6361 8388	Orange Veterinary Hospital	11
US-56A	Non-chemical means of harvesting deer antler	Anthony English	02 9351 1675	University of Sydney	13

2.3 DEER RESEARCH IN PROGRESS

PROJECT No	PROJECT TITLE	RESEARCHER	PHONE	ORGANISATION	PAGE No
COW-1A	Deer R&D Newsletter - Publication and Distribution	Andy Cowan	03 5774 7489	Andy Cowan	14
DEN-4A	Deer R&D Newsletter - Editorial Services	Laurence Denholm	02 6361 3268	Laurence Denholm	15
DIA-2A	Development of niche European market opportunities - Follow up to DIA-1A	Chris Tuckwell	08 8523 3500	Deer Industry Association of Australia	16
DIP-3A	Development of niche regional domestic and Japanese markets for differentiated specific cuts of venison	Chris Tuckwell	08 8523 3500	Rural Industry Developments Pty Ltd	17
DIP-4A	Quality assurance, strategic alliances and industry development	Chris Tuckwell	08 8523 3500	Rural Industry Developments Pty Ltd	18
UQ-78A	Drought feeding - Early weaning strategies	Gordon Dryden	07 5460 1255	University of Queensland	19
UWS-16A	Nutritional requirements and growth characteristics of pregnant and lactating red and fallow deer	Robert Mulley	02 4570 1438	University of Western Sydney	20
SAR-21A	Defining energy and protein requirements of fallow deer under a Mediterranean environment	Yingjum Ru	08 8303 7787	South Australian Research and Development Institute	21
TUC-1A	Development of a new Five-Year Deer Industry Research and Development Plan for 2000-2005	Chris Tuckwell	08 8523 3500	Rural Industry Developments Pty Ltd	23
UA-46A	Overcoming summer/autumn nutritional constraints to deer production in Southern Australia	Philip Tow & Dean Revell	08 8303 7857 08 8303 7911	University of Adelaide	24

2.3 Deer Completed Projects

Project Title:	The influence of pre slaughter conditions on the occurrence of ecchymosis (blood splash) in deer carcasses
RIRDC Project No.:	BRN-1A
Researcher:	Kevin Barnes
Organisation:	Onkaparinga Valley Venison PO Box 140 BALHANNAH SA 5242
Phone/Fax:	(08) 8388 4205
Objectives	<ul style="list-style-type: none"> • To compare and contrast the incidence of ecchymosis in deer carcasses under two alternative slaughtering systems. • To determine the influence of carcass fat levels, weight and sex of animals on the occurrence of ecchymosis in deer carcasses.
Background	<p>Ecchymosis represents a marketing resistance in the venison industry as it lowers the appeal of meat to buyers, shortens shelf life of the meat and causes carcasses to be condemned for export. It is known that ecchymosis may be affected by slaughtering conditions (RIRDC Project UWS 12A). Experience has led us to suggest that both the stress levels of the animals and their fat levels may affect the occurrence of ecchymosis in their carcasses.</p>
Research	<p>A total of 334 fallow deer were processed at Strathalbyn Abattoirs from May – July 1997. The presence/absence of ecchymosis in the meat was recorded as well as the fat level, sex and weight of the carcasses. A new killing system was subsequently developed during 1998 involving alterations to the internal sheep killing chute. The main outcome of these alterations was a significant reduction in the time taken between killing, bleeding and hanging the animals. Whilst using the new killing system, the above mentioned factors were recorded for 426 animals processed from May – July 1999.</p>
Outcomes	<p>Chi squared analyses indicated that fat levels and sex of the animals was significantly related to the presence of ecchymosis in the meat and was found to be higher in castrates of medium fat level. The weight of the animals was found to be unrelated. However, by far the largest influence on presence of ecchymosis in this project was found to be the killing method. Under the new killing system developed at Strathalbyn Abattoir, the percent of animals with ecchymosis dropped from 20% to 3%.</p>
Implications	<p>The alterations to the killing system at Strathalbyn Abattoirs have been found to significantly reduce the occurrence of ecchymosis in venison meat, presumably due to a significant reduction in the time between killing, bleeding and hanging the animals during the slaughtering process. These alterations could be carried out at other venison processing facilities throughout Australia to aid in improving the quality of both the Australian and export markets.</p>
Publications	Final report. Additional publications subject to discussion with RIRDC.

Project Title	Venison Market Development in Europe
RIRDC Project No.:	DIA-1A
Researcher:	Rudolf S Keller
Organisation:	Deer Industry Association of Australia PO Box 204 Dorrigo NSW 2453
Phone:	(02) 6657 2088
Fax:	(02) 6657 2088
Objectives	<ul style="list-style-type: none"> • Identification of "niche" markets in Europe. • Determination of likely scale and export potential in Europe. • Identification of chain methodology and potential agents in Europe. • Gauge acceptance of Australian QA branded venison in Europe.
Background	<p>To date Australian Marketers have sold venison into commodity markets, competing directly with each and large volume suppliers like New Zealand. This strategy has produced low and fluctuating returns to growers. The underlying objective of this project was to improve returns to Australian Deer Farmers by identifying markets and marketing methods that will potentially yield higher and more consistent margins and subsequently create an environment for industry expansion. This would encourage small enterprises to expand and become viable resulting in a positive effect on employment opportunities in rural areas.</p>
Research	<p>The total project involves three stages. The now completed first and second stages sought to identify "niche" markets in Europe, quantify market interest and likely demand, identify potential distribution networks, potential agents and interest in Australian Quality Assured branded venison product. A total of 58 contacts were identified. Four of the contacts, that operated within the traditional system of commodity trading, were provided by AUSTRADE. Preliminary contacts, by fax, letter and personal phone calls, resulted in a short list of 11 potential partners. Appointments for in detail discussions were made with each of the short-listed contacts.</p>
Outcomes	<p>A number of organisations expressed interest in long term contracts with the DIAA provided that Australian farmers commit themselves to:</p> <ul style="list-style-type: none"> • branded and Quality Assured Australian products, • firm supply agreements with scheduled delivery dates, • guaranteed supply with firm all year round prices that assure viability of farmers, and • an open book financial relationship with profit sharing arrangements. <p>The project recommended a number of organisations for further discussion and negotiation. The broad basis for likely contracts was discussed.</p>

Implications

German partners are willing to form alliances and future joint ventures with the DIAA. The basis of such arrangements is to return a minimum of AUD\$3 per kg HSCW to Australian farmers with further sharing of windfall profits. Stage 3 of the project should be funded and implemented immediately to ensure that this valuable opportunity is not lost. The implementation of Stage 3 Project may provide a basis for long-term stability to the Industry by encouraging an ongoing commitment to Quality Assurance supported by improved farmer returns and increasing market demand for Australian Venison.

Publications

Project Title	Venison Carcase Specification Manual
RIRDC Project No.:	DIP-2A
Researcher:	Chris Tuckwell
Organisation:	Deer Industry Company
Phone:	PO Box 1105, Gawler 5118
Fax:	(08) 8523 3500
Objectives	<ul style="list-style-type: none"> • To correct and update the existing Venison Carcase Specification manuals and reproduce it in a form that will allow: (i) easy amendment of individual pages; (ii) easy additions as new specifications are developed, and; (iii) combine the original specification manual with the original venison language manual.
Background	<p>During the early 1990's the Australian Deer Industry with support from the Rural Industries Research and Development Corporation and the cooperation of the Authority for Uniform Specifications of Meat and Livestock (AUS-MEAT), developed a manual of carcase specifications and a standard meat (venison) language for deer</p> <p>Those involved with the production of the first manuals recognised that venison specifications and language will progressively change as the Deer industry develops. Ongoing development means that manuals need continual amendment and upgrading to accurately reflect industry standards.</p> <p>As part of its program to assist the expansion of the Australian Deer herd by encouraging the processing of venison to industry standards, the Deer Industry Company recognised the importance of up-to-date venison specifications.</p> <p>Standard industry venison specifications allow marketers and their clients to negotiate the sale and purchase of products without misunderstanding.</p>
Research	<p>The major components of the project were:</p> <ol style="list-style-type: none"> A review of existing manuals with the cooperation of the Australian Venison Processors Association; Consideration of new specifications to be included in new manuals; Design of new manuals that allow easy amendment of existing specifications and the addition of new specifications, and; Production of new manuals for distribution (sale) to industry and the writing of computer files used to create the new manual to a computer CD.

Outcomes

The project has produced 500 new manuals.

We have produced the manuals as two-ring vinyl folders containing pages 160 mm wide by 180 mm tall.

The Manual presents a specification section (first) and a language section.

The Specification section is separated into an introductory section of three pages, a Bone-In section of six pages (twelve different meat cuts) and a Boneless section of fifteen pages (twenty nine different meat cuts) by dividers.

Four of the newly included Bone-In specifications do not include a photograph of the specification or an EXDOC number. Photographs of the new specifications were unavailable and EXDOC numbers for those specifications had not been allocated at the time of printing.

We considered that further delays in the production of the new manual while waiting for photographs and allocation of EXDOC numbers for new specifications were unwarranted.

Although the manual has been produced without photographs and EXDOC numbers for four of the new specifications, other descriptions of the new specifications (text specification and skeletal location of the specification) are provided in a similar format to all other specifications.

The new manual will be easily updated when photographs and EXDOC numbers are available for the new specifications.

Computer files used to produce the manuals were written to a computer CD for storage of information for future upgrading and to allow RIRDC to provide information contained in the manual to its Web site clients.

Publications

Venison Carcase Specification Manual.

Project Title	Decision Support System for Managing Red and Rusa Deer in Queensland
RIRDC Project No.:	DAQ-246A
Researcher:	Stephen Sinclair
Organisation:	Department of Primary Industries, Queensland P O Box 96 IPSWICH QLD 4305
Phone:	(07) 3280 1905
Fax:	(07) 3812 1715
Objectives	<ul style="list-style-type: none"> • Development and commercialisation of existing knowledge into a computer Decision Support System (DSS) management package which will evaluate both nutritional and economic ‘whole farm’ management scenarios for red (<i>Cervus elaphus</i>) and rusa (<i>Cervus timorensis</i>) deer in Queensland, and • to provide existing deer farmers a tool to improve information and management skills on a ‘whole property’ basis, in addition to acting as a precursor for further industry expansion.
Background	<p>The farmed deer industry in Queensland is currently considered as emergent, with numbers static and possibly in decline. Red and rusa deer are the major farmed species located predominantly in south-east Queensland. The inability of the industry to attract sufficient commercial size operations to enable economies of scale for management, product processing and marketing has been a significant recognised impediment to industry growth and development. In view of the uniqueness of deer farming as a livestock enterprise with associated management and technical requirements, a role for interactive computer-based decision support systems (DSS) to aid in information transfer, farm scenario evaluation and supportive decision making seems appropriate. In recent years a range of DSS packages have been available to Queensland beef producers, and the deer industry could achieve a specific pioneer DSS based on an existing beef cattle management package template.</p>
Research	<p>The process for model development relied firstly on the selection of an existing beef cattle DSS for Queensland, namely FEEDMAN (© 1996, The University of Queensland), a beef cattle management software program that compares feeding management scenarios for growing cattle in southern/south-east Queensland. Using the existing template based on MS Access 97 and coded with Visual Basic™, deer production algorithms and deer mob management, economics and market options were incorporated. Deer production (venison and velvet) mathematical equations were derived using information based on an extensive review of existing literature on deer nutrition and management in Queensland. Spreadsheet models were validated and prototype software then evaluated and further validated prior to commencement of the commercialisation phase for the software.</p>

Outcomes

A computer-based beef cattle and deer management DSS has been developed (FEEDMAN v 3.0, © 1995-1999, The University of Queensland) enabling whole property management scenarios for growing animals to be evaluated in terms of forage utilisation (including supplementation), animal performance, market options and economics. The program is designed for forage-based production systems and includes provision for sustainable stocking rate calculation.

Implications

The compilation of the first DSS for deer management in Queensland has provided for information transfer of technical and economic inputs, specific to deer production systems, that will aid in the encouragement of industry expansion and productivity gains within the state. On a national level, such productivity gains can also be measured in the ability to contribute to year round quality, specific market targeted venison supply and hence compliment seasonal venison production in the southern states. It is also hoped that commercial beef producers, using the DSS to evaluate beef and deer enterprises on the same property, will be encouraged to include deer farming as a viable alternative livestock enterprise and contribute to increasing deer numbers in the state.

Publications

Deer in Queensland: A Decision Support System,
RIRDC Publication 00/19.

Project Title**Eating qualities of venison from red and fallow deer**

RIRDC Project No.:

FSA-1A

Researcher:

Frank Shaw

Organisation:

Food Science Australia, Brisbane Site
PO Box 3312
TINGALPA DC QLD 4173

Phone:

(07) 3214 2001

Fax:

(07) 3214 2062

Email:

Frank.Shaw@foodscience.afisc.csiro.au

Objectives

- To compare the eating qualities of venison from red and fallow deer produced under best practice commercial conditions.

Background

If the venison industry wishes to produce and sell product of guaranteed tenderness then it may be desirable to develop a 'pathway' system similar to that used by the Meat Standards Australia (MSA) grading system for beef. The system could specify animal, processing and carcass factors.

Research

A total of 20 red deer and a total of 20 fallow deer were processed at an abattoir on the same day. There was a subgroup of 10 red and 10 fallow from the same property. All 40 animals were transported on the same vehicle and processed under similar conditions. Muscle pH and temperature measurements were recorded during the initial chilling period. Topside and loins were subsequently removed from the experimental carcasses and vacuum-pack aged for 2 weeks. *Semimembranosus* (SM) and *Longissimus* (LD) muscles were then removed from the topsides and loins, respectively, and used for objective (Warner-Bratzler machine) measurements of tenderness while the *Longissimus* muscles were also evaluated by a trained sensory panel.

Outcomes

Warner-Bratzler tenderness measurements indicated that the *longissimus* muscles were tender (mean shear force < 3 kg) and that there were no differences between the groups. The SM muscles were less tender, as would be expected, than the LD muscles. The SM muscles from the red deer were significantly more tender (3.2 vs 4.4 kg) than those from the fallow. Ultimate pH values were significantly greater in the fallow group than in the red.

The trained taste panel scores showed that there was no significant difference in eating quality of loins from red and fallow deer. Loins were judged to be in the 'tender' range and overall quality of the product was in the 'moderate-good' range.

Implications

If the venison industry wishes to set up a grading system for meat quality, similar to the MSA system for grading beef, then the commercial procedures followed throughout this project could form part of the 'pathway' for the production of venison of guaranteed tenderness. Ultimate pH may be a simple, but important, measurement to assist in the elimination of tough product. Ultimate pH values suggest that fallow deer may be particularly susceptible to stress and further refinement of handling practices for these animals may be necessary.

Publications

Final report. Additional publications subject to discussion with RIRDC.

Project Title	Domestic Venison Marketing: A Test Case
RIRDC Project No.: Researcher: Organisation: Phone: Fax:	HES – 1A Daryl Heslop Willtun, Wollombi Road Cedar Creek NSW 2325 (02) 4998 1576 (02) 4998 0008
Objectives	<ul style="list-style-type: none"> • To process and distribute deer carcasses via an integrated supply chain during six months from April 1 1999. • To create public awareness of quality assured Australian venison through restaurants and retailers with appropriate point of sale support. Initial retailers would be suitable butchers.
Background	<p>Small scale producers in regional areas, particularly with existing or potential wine and food tourism were frustrated by the dominance of venison exporting and perceived neglect of the niche domestic markets. There was lack of knowledge of the best strategy to address these segments.</p>
Research	<p>Butchers were identified who agreed, at least initially, to buy deer carcasses and to cut and distribute venison to restaurants and to consumers. Point of sale material was used to try to increase awareness and stimulate demand. Attempts to interest the media, particularly the local newspapers, in the availability of the product were initiated. A local cooking school was supplied with venison to increase exposure of the product.</p>
Outcomes	<p>Supply of venison in carcase form proved to be difficult for butchers as less preferred forequarter cuts were difficult to sell, and trimmings made into sausages were significantly more expensive than beef or pork sausages. Some restaurants were interested but there was demand only for cuts such as striploin, tenderloin and topside, which comprise only a small part of the carcass. There was general lack of knowledge of the versatility and uses for other venison cuts, and the socio-economic conditions of the general community made consumer sales difficult. Restaurants serving the more affluent tourist segment were satisfied with the product but try to offer wide variety of alternative meats which had venison competing for a menu place with ostrich, buffalo, emu, kangaroo, goat, rabbit (wild and farmed), hare as well as game birds.</p>
Implications	<p>Review of all previous project publications on market development is important to identify factors likely to impact on the success of the project. Accurate identification of the likely target market/s and the logistics of supply and distribution has been found to be an essential prerequisite task. The single most important task after identifying venison's specific advantages or unique characteristics, is to conduct market research (informal if necessary) with the members of the target segment. Significant market research has been performed in previous RIRDC projects, much of which is still relevant. Interviews with potential customers (either butchers or restaurants) to indicate attitude</p>

to, and possible usage of venison should also identify preferences for certain venison cuts, specifications and presentation or packaging style. Price sensitivity and tolerance range is critical as this could be the principal factor in the long term viability of the venture.

Publications

RIRDC publications as recommended reading: Adding Value to Venison Forequarters and Trimmings; Venison Market Development Programs Towards 2000; Deer Production and Marketing Study; Eating Qualities of Venison from Red and Fallow Deer.

Project Title	A study of reproductive performance and pre- weaning mortality in farmed red deer in Australia.
RIRDC Project No.:	OVH-1A
Researcher:	Dr. Andrew Hansen
Organisation:	Orange Veterinary Hospital 57 Molong Road, Orange, NSW 2800
Phone:	(02) 6361 8388
Fax:	(02) 6362 3970
Objectives	<ul style="list-style-type: none"> • Assess the reproductive performance of farmed Australian red deer. • Identify the major causes of depressed reproductive performance. • Identify management strategies to improve performance. • Identify the major causes of calf mortality from birth to weaning. • Identify areas of red deer reproduction requiring further research.
Background	Reproductive performance is recognised as the primary determinant of pre-farm gate production efficiency in breeding herds for meat production. Factors that depress breeding success have a significant adverse effect on profitability. Information on the reproductive performance of Australian farmed red deer is essential so that below optimal performance can be identified and necessary management changes instituted.
Research	<p>The major component of this project was a series of four annual questionnaires sent to red deer farmers throughout Australia seeking information on farm reproductive performance, management practices, variations in herd nutritional status hind and calf mortality rates and disease control measures. The results were then subjected to statistical analysis.</p> <p>A basic body condition scoring system was developed to enable farmers to assess to assess the nutritional status of their deer. Information was also sought from farmers on the causes of calf mortality and farmers were encouraged to submit dead calves to diagnostic laboratories for necropsy examination and accurate determination of the cause of death. Genitalia from non pregnant hinds was collected from abattoirs and examined for abnormalities. Two selenium treatment trials were conducted to assess the effect of selenium supplementation on the growth rate of red deer.</p>
Outcomes	<p>The study revealed a weaning rate for 21,300 joined hinds over four years of 77.98% Weaning rate per mob averaged 79.2% with a range from 0% to 100% Minimum calf mortality rate was 5.01%. Highest recorded calf mortality in a single mob was 42.8% The dystocia rate over four years was 1.27% and annual hind mortality rate 1.44% Retention of dry hinds in breeding mobs was found to be the management procedure causing the greatest reduction in weaning rate. Management factors accounted for most calf mortalities with only 1.1% of deaths attributed to disease. Cryptosporidiosis was the most common infectious cause of mortality.</p> <p>Pasture topdressing with selenium produced an improvement in live-weight gain in a group of weaner hinds.</p>

Implications

This study has produced a range of reproductive data to which farmers can compare their herd and use to establish goals for herd improvement. A calving rate of over 90% with a calf mortality rate of less than 5% resulting in an 85% weaning rate should be the achievable goal of Australian red deer farmers.

Publications

Final Report.

Project Title	Non-Chemical means of harvesting velvet antler
RIRDC Project No.:	US-56A
Researcher:	Dr Anthony English
Organisation:	University of Sydney Dept of Veterinary Clinical Sciences PMB 3, 425 Werombi Road CAMDEN NSW 2570
Phone:	(02) 9351 1675
Fax:	(02) 9351 1618
Objectives	<ul style="list-style-type: none"> To trial a non-chemical means of harvesting velvet antler under Australian farming conditions.
Background	<p>Deer velvet antler is currently harvested after the administration of a local anaesthetic. The industry has, for some time, wanted to examine the scope for harvesting velvet antler without the use of chemicals, in order to avoid the presence of drug residues in the product. It is a basic requirement that any new technique should achieve effective analgesia and be no less humane than currently accepted methods.</p>
Research	<p>There is extensive literature on compression analgesia, which is the basis of the technique under consideration. Most studies have been on human subjects, with clear evidence of effective analgesia being achieved by compression of nerves or nerves and associated blood vessels. This principle was the basis of studies on velvet antler harvesting carried out on yearling red deer “spikers” by Dr Lindsay Matthews, Director of the Animal Behaviour Research Centre, Hamilton, New Zealand.</p> <p>An effective method was developed and subsequently approved by the Chief Veterinary Officer of New Zealand in 1998 for use in the field. A trial of this new technique in Australia was undertaken at Orange NSW in December 1998.</p>
Outcomes	<p>The trial showed that rubber rings achieved total analgesia for velvet antler removal in red deer “spikers” and this was the case whether the deer were velveted in a pen or in the crush. Furthermore, application of the rings was faster and easier than injection of local analgesic into the antler pedicle. The results indicate that not only does compression analgesia using rubber rings achieve extremely effective analgesia for velvet removal from red deer “spikers” but also that effective analgesia is more consistently achieved than by the currently approved method.</p>
Implications	<p>It is likely that this technique for non-chemical velvet harvesting will become the preferred method for velvet removal from young deer thereby avoiding the risk of residues in antler products which are used for human consumption.</p>
Publications	<p>The Corporation understands that the results of this research will be published in professional journal in the near future.</p>

2.3 Deer Research in Progress

Project Title	Deer R&D Newsletter - Publication and Distribution
RIRDC Project No.:	COW-1A
Start Date:	1/01/98
Finish Date:	31/12/00
Researcher:	Mr. Andy Cowan
Organisation:	Maroondah Highway BUXTON VIC 3711
Phone:	(03) 5774 7489
Fax:	(03) 5774 7216
Email:	cowan@virtual.net.au
Objectives	<ul style="list-style-type: none">• To publish and distribute six issues per year of a RIRDC Newsletter on Deer R&D by the middle of February, April, June, August, October and December of each year of the contract.
Current Progress (200 words maximum)	See report for Project Number DEN-4A.

Project Title**Deer R&D Newsletter - Editorial Services**

RIRDC Project No.: DEN-4A
Start Date: 1/01/98
Finish Date: 31/12/00
Researcher: Dr. Laurence Denholm
Organisation: PO Box 1564
ORANGE NSW 2800
Phone: (02) 6361 3268
Fax: (02) 6361 3268
Email: denholml@bigpond.com

Objectives

- To produce six issues per year of a RIRDC Newsletter on Deer R&D by:
 - a) being the editor of the Newsletter;
 - b) being responsible for the content of each issue which will comprise four A4 sheets;
 - c) being responsible for the collation and layout of each issue of the Newsletter;
 - d) being responsible for maintaining and supplying an up-to-date mailing list to the contractor responsible for its publication and distribution; and
 - e) being responsible for forwarding the text of each issue to the contractor responsible for its publication and distribution by the middle of February, April, June, August, October and December of each year of the contract.

**Current Progress
(200 words maximum)**

DEN-4A provides editorial services for production of the RIRDC Deer Products R&D Newsletter. This bimonthly publication is the principle means by which RIRDC communicates the progress and results of its deer research and development program to industry stakeholders, in particular deer farmers who pay statutory levies on the sale of their products. The newsletter fulfils a commitment given by government at the time of the introduction of the deer levy scheme to ensure that all deer farmers were aware of results from their R&D program. With only one in three deer farmers being members of deer industry organisations, the newsletter is the only means by which RIRDC and the peak industry council, the Deer Industry Association of Australia, can access the majority of Australian deer farmers. The newsletter is used to seek comment from deer farmers on particular R&D issues including proposed projects. Announcements in the newsletter facilitate the participation of all deer farmers in planning the deer R&D program, particularly when R&D priorities in the industry's strategic plan are being reviewed. Most issues of the newsletter include summaries of progress reports and final reports from RIRDC funded deer R&D projects. The newsletter is also used to alert deer farmers to emerging problems facing the industry.

Project Title**Development of niche European market opportunities -
Follow up to DIA-1A**

RIRDC Project No.:	DIA-2A
Start Date:	1/12/99
Finish Date:	30/06/00
Researcher:	Mr. Chris Tuckwell
Organisation:	Deer Industry Association of Australia c/o PO Box 37 LISMORE VIC 3324
Phone:	(08) 8523 3500
Fax:	(08) 8523 3301
Email:	tuckwell@dove.net.au

Objectives

- Oversee the development of niche export markets for Australian venison.

**Current Progress
(200 words maximum)**

The project is a follow up to RIRDC project DIA-1A that identified alternate businesses in Germany that may be suitable partners for a joint venture marketing project. Project DIA-1A also nominated a preferred supplier (VPC) of Australian venison from those who tendered for the opportunity.

A preferred partner was identified and contact made with managers of the German business (PW). The manager of the business visited Australia in January 2000 and was shown farms, transports and processing plants.

An initial contract to supply a trial shipment (single container) of venison was agreed with a view to developing detailed specification for future shipments. The shipment was collected and processed by the VPC and arrived in Germany in May 2000.

The preparation of, long-term venison supply contracts and associated business arrangements is now dependent on PW providing detailed information about venison specifications required and subsequent development of a mutually acceptable business relationship.

Project Title**Development of niche regional domestic and Japanese markets for differentiated specific cuts of venison**

RIRDC Project No.: DIP-3A
Start Date: 1/07/99
Finish Date: 31/01/01
Researcher: Mr. Chris Tuckwell
Organisation: Rural Industry Developments Pty Ltd
PO Box 1105
GAWLER SA 5118
Phone: (08) 8523 3500
Fax: (08) 8523 3301
Email: tuckwell@dove.net.au

Objectives**Part 1**

1. To identify, investigate and report on niche domestic and Japanese markets for Australian venison and identify and evaluate the potential of Australian domestic market sub-sectors and product preferences.
2. Develop cuts and packaging/presentation appropriate to individual niche market needs.

Part 2

1. To 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.
2. A review and updating all industry QA manuals, with particular emphasis on the inclusion of HACCP sections in each manual.
3. To 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.
4. To update and rewrite the Deer Industry Code of Practice.

**Current Progress
(200 words maximum)****Japanese in-market research and Foodex 2000 trade fair.**

Fallow venison is preferred (smaller cut sizes and premium image). NZ venison has image of large, wild almost feral product. NZ venison at exhibited included various vacuum packed, frozen cuts. One company is focusing more on value added products that are popular additions to menus in Ryokens (Japanese Inns). There is evidence of extensive use of cold set binder technology.

The Japanese CEO of Tender Plus Tokyo believes there is potential to replace NZ venison with Australian fallow product if well promoted. Importers of game meats including venison, are looking for product support material similar to that from MLA (beef and lamb) and from the Pork Corporation. Displays by USA meat suppliers to Japan included expensive and comprehensive books for each sector of the market.

Domestic Market

The Australian domestic market remains small although it appears to be slowly expanding principally through individual marketer efforts. Broadly the market still does not trust the industry's commitment to supply and quality.

Some progress has been made with a major processor now able to market venison trim into domestic markets centred in Brisbane and Melbourne.

Significant progress has been made in the production of technical information related to visual animal assessment that will assist producers better prepare animals for sale and so improve returns to growers and improve average quality and objective assessment of venison quality available to the market.

Project Title**Quality assurance, strategic alliances and industry development**

RIRDC Project No.:	DIP-4A
Start Date:	1/07/99
Finish Date:	30/06/01
Researcher:	Mr. Chris Tuckwell
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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
(200 words maximum)**

The project continues to meet its broad milestone commitments. The industry QA programs continue to expand slowly as the program receives increasing support from purchasers and marketers of Australian venison. The processor of the largest volume of Australian venison now suggest that within two years his company will pay a premium for animals sourced from quality accredited farms.

Industry statistics support generally accepted information that industry product prices are more buoyant than any time over the previous five years as demand grows faster than industry's ability to supply.

Simple software programs have been developed to encourage processors to purchase stock on a quality grid system that rewards those who produce ideally finished stock and penalized those who don't. New software is in development to encourage a standardized approach to data recording and reporting of processing information to individual growers and, in summary for to industry.

Applications to register quality assurance brand marks for: farms, deer transporters, venison and velvet antler have been lodged with the Trade Marks Office. Although a significant time delay is usually associated with registering trademarks, the Trade Marks Office has agreed to expedite the applications.

Project Title**Drought feeding - Early weaning strategies**

RIRDC Project No.: UQ-78A
Start Date: 1/07/98
Finish Date: 31/12/00
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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
(200 words maximum)**

Red deer calves were weaned at 7 and 9 weeks. They were given, *ad lib.*, a good quality lucerne hay, and a pelleted diet of 54% wheat grain, 23% barley grain, 5% molasses, 15% soybean meal, 0.3% salt, 0.9% limestone, 0.3% canola oil, 0.5% synthetic lysine and 1% mineral/vitamin premix. Animals of both ages grew at approximately the same rate. The younger calves were smaller at the end of the experiment in March (40.2 v. 46.1; P=0.023), but these differences had disappeared by 27 December, 1999 (62.7 v. 67.8; P=0.133). Weaning at 7 weeks is feasible, although earlier-weaned calves will be smaller than normal for several months.

Project Title**Nutritional requirements and growth characteristics of pregnant and lactating red and fallow deer**

RIRDC Project No.: UWS-16A
Start Date: 1/07/97
Finish Date: 30/06/00
Researcher: Dr. Robert Mulley
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Objectives

- Prepare information on the feed intake and energy requirements of pregnant and lactating fallow deer.

**Current Progress
(200 words maximum)**

Metabolisable energy (ME) intake has been determined (over two consecutive breeding seasons) for pregnant and lactating fallow deer does of two genotypes. The data has been analysed and published in several journals and conference proceedings. Similarly, ME intake for weanling fallow deer fawns from 12 to 20 weeks of age has also been completed and published. These results were recently presented at the New Zealand Veterinary Association (Deer Branch) Conference, Queenstown, New Zealand, and will also be presented to the Australasian Association for Animal Production in Sydney, in July 2000.

Blood metabolite assays have recently been completed, and the analysis of these will inform i) other measurements of placental and foetal size over various maternal nutrition treatments, and ii) confirmation of condition score appraisal. Recent collaboration between the UWS - Hawkesbury Deer Research and Teaching Unit and Mr Chris Tuckwell (Deer Industry Development Company) has produced a condition scoring poster for fallow deer, which will be distributed to processors and deer farmers.

Jason Flesch is in the closing stages of his PhD candidature, and will submit his thesis for assessment in September 2000.

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
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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
(200 words maximum)*****Training of deer***

Six red and 6 fallow deer were housed in a group in a 7x7m compound in an Animal House. Fresh lucerne and grain was used to accustom the deer to handling. During acclimatisation a video camera recorded behaviour of deer in time lapse to ensure deer adapted well to their environment before being transferred into individual metabolism stalls. Training took longer than expected, but there was no injury or abnormal behaviours observed during the experiment.

In vivo digestibility trial to determine supplementary feeding strategy

To determine the nutritive value of feed, 6 red and 6 fallow deer were housed in individual stalls from November - May, 2000. Six sheep were also included in this experiment to investigate whether they could be used as a model for evaluating feed for deer. The experiment was conducted over two periods, with a 656 Latin Square design for each period. Eleven feed ingredients were evaluated, including grains (barley, wheat, sorghum, oats, lupin), straw (barley straw, pea straw) and hays (lucerne chaff, oaten chaff, wheaten chaff, medic hay). The experimental diets were fed to animals for two weeks and then a week of total faeces collection. All samples are currently being analysed and results will be reported in November 2000.

In vitro digestibility trial

Three red, 3 fallow deer and 3 sheep were slaughtered to collect rumen fluid. The 11 feed samples tested in vivo were incubated with rumen fluid for 48 hrs, followed with pepsin for another 48 hrs. There was a significant difference in the dry matter digestibility and digestible energy content of feed between sheep, red and fallow deer. Fallow deer had the highest digestibility and sheep had the lowest. There was no interaction between animal species and feed ingredients. The relationship between *in vivo* and *in vitro* results will be reported in November 2000.

Alkane recovery rate

To determine feed intake under grazing condition, alkane was used as an external marker in 6 fallow deer to determine the recovery rate of alkanes after dosing with alkane capsules. Faeces of 6 fallow deer were collected daily for a period of 24 days. Subsamples of faeces were freeze dried and analysed and showed that the alkane concentration in the faeces was stable from day 7-day 19. The recovery rates of alkanes from faeces were about 40 mg for C32 and 37 mg for C36 alkanes.

Forage intake trial

Sixty fallow deer (weaners) were selected and divided into three groups of equal sex and supplemented at three levels respectively (300g, 600g and 900 g/day/head). The amount of feed was adjusted according to the body weight. This experiment commenced on 28/4/2000.

Delivery of research outcomes

- Mr Warwick Hack introduced the research project to South Australian deer farmers on 29/8/99 at the Roseworthy field day.
- Dr Yingjun Ru reported the preliminary results to the South Australian Deer Farm Association meeting on 29/4/2000.
- Housing deer indoors- paper submitted to ANZCAART

Project Title**Development of a new Five-Year Deer Industry Research and Development Plan for 2000-2005**

RIRDC Project No.: TUC-1A
Start Date: 1/01/00
Finish Date: 31/07/00
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Objectives

- To develop a five-year Research and Development Plan for the Australian Deer Industry.
- To provide advice on appropriate funding for the implementation of the Plan.

**Current Progress
(200 words maximum)**

In December 1999 almost 100 people were contacted by either telephone, fax or mail and asked to respond to initial questions about the proposed content of the Plan.

During February 2000 a draft plan was produced for comment by industry. Copies of the draft were provided to members of the Executive council of the Deer Industry Association of Australia (DIAA), secretaries of all DIAA branches and other industry representatives. DIAA branch leaders were encouraged to seek comment from their membership about the Plan prior to responding to the draft.

The draft Plan is currently being amended in consideration of responses from those who have considered the draft and suggested amendments.

A second draft of the Plan will be prepared during May 2000 and made available on the RIRDC web site for further consideration by industry.

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

RIRDC Project No.: UA-46A
Start Date: 1/07/98
Finish Date: 30/06/01
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Objectives

- Provision of cost-effective strategies for nutrition of weaner deer in dryland farming regions in 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
(200 words maximum)**

Data obtained in 1999 indicated that animals that performed best during the two months of supplementary feeding immediately after weaning remained heavier at the end of spring. As a consequence, a greater proportion reached a suitable market weight at the start of summer.

Supplements being investigated in the current study are a cereal grain/pulse mixture, cereal grain, medic hay and standing lucerne. Animals were weaned in late March and were initially grouped together with *ad libitum* access to hay and grain for one week before allocation to their treatment groups and paddocks. This was a modification based on last year's findings, and aimed to reduce the stress of weaning and immediate separation into smaller treatment groups. A temporary weight loss during the first 2 weeks post-weaning was not avoided, but most animals began gaining weight within 17 days of weaning. The use of electric fencing to separate treatment groups appears problematic, with some animals temporarily escaping from their allocated paddocks. Preliminary data indicate that weaner fallow deer perform approximately equal to, or better, on standing lucerne than with grain supplements. Lucerne and annual medic pasture that will be used later in the season have responded well to opening rains.