



Australian Government

**Rural Industries Research and
Development Corporation**

RIRDC Completed Projects in 2003 - 2004
and Research in Progress as at June 2004

Sub-Program 2.3

DEER

**September 2004
RIRDC Publication No: 04/070**

© 2004 Rural Industries Research and Development Corporation.
All rights reserved.

ISBN 0 642 58780 9
ISSN 1440-6845

*"RIRDC Completed Projects in 2003 - 2004 and Research in Progress as at June 2004
- 2.3 Deer".
Publication No 04/070*

The views expressed and the conclusions reached in this publication are those of the author and not necessarily those of persons consulted. RIRDC shall not be responsible in any way whatsoever to any person who relies in whole or in part on the contents of this report.

This publication is copyright. However, RIRDC encourages wide dissemination of its research, providing the Corporation is clearly acknowledged. For any other enquiries concerning reproduction, contact the Publications Manager on phone 02 6272 3186.

RIRDC Deer Research Manager

Dr Laurence Denholm
RIRDC
Level 1, AMA House
42 Macquarie Street
BARTON ACT 2600
PO Box 4776
KINGSTON ACT 2604

Phone: 02 6365 5482
Fax: 02 6365 5482
Mobile: 0418 641 957
Email: denholml@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: cecile.ferguson@rirdc.gov.au
Website: <http://www.rirdc.gov.au>

Published in September 2004
Printed on environmentally friendly paper by

Foreword

This year RIRDC has produced *Research in Progress, June 2004*, which contains short summaries of continuing projects as well as those that were completed during 2003 - 2004 for all of the Corporation's program areas.

The complete report on all the programs is only available in electronic format on our website at <http://www.rircd.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 an addition to our extensive catalogue of almost 1000 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.

- downloads at www.rircd.gov.au/fullreports/Index.htm
- purchases at www.rircd.gov.au/eshop

Simon Hearn

Managing Director

Rural Industries Research and Development Corporation

Contents

2.3 DEER COMPLETED PROJECTS

PROJECT No	PROJECT TITLE	RESEARCHER	PHONE	ORGANISATION	PAGE No
Improve the Profitability of the Australian industry for all stakeholders					
CAM-1A	Improving Deer Industry Profitability through Research Uptake – Pilot Project	Gaye Cameron	(03) 5983 2030	Private	1
DIP-9A	Deer Production Handbook and Industry Statistics	Chris Tuckwell	(08) 8523 3500	Rural Industries Development	3
DIP-12A	Generic Investment Proposal Development	Chris Tuckwell	(08) 8523 3500	Rural Industries Development	5
KDI-26A	A complete guide to deer farming in Australia	Pamela Horsley	(08) 9478 3343	Kondinin Group	7
Facilitate adoption of improved production technologies					
DIP-13A	Dissemination of results of research projects	Chris Tuckwell	(08) 8523 3500	Rural Industries Development	8
Improve on farm production efficiency					
SAR-26A	Effect of salt intake on feed intake and growth rate of fallow and red weaner deer	Dr Yingjun Ru	(08) 8303 7787	South Australian Research Development Institute	10

2.3 DEER RESEARCH IN PROGRESS

PROJECT No	PROJECT TITLE	RESEARCHER	PHONE	ORGANISATION	PAGE No
Improve on farm production efficiency					
SAR-41A	Optimum weaning time for fallow deer in southern Australia	Dr Yingjun Ru	(08) 8303 7787	South Australian Research Development Institute	12
MAT-1A	Restoration of cartilage by novel gene therapy	A/Prof Peter Ghosh	(02) 9926 7239	Matrix Gene P/L	13
UWS-18A	Study of the Relationship between body condition score, carcass composition and consumer perception of venison quality	Dr Robert Mulley	(02) 4570 1438	University of Western Sydney	14
Develop international and domestic markets for Australian venison and develop supply chain management programs					
AHA-1A	An Australian Johne's Disease Market Assurance Program for Deer	Mr David Kennedy	(02) 6365 6016	Australian Animal Health Council Ltd	16

2.3 DEER COMPLETED PROJECTS

Improve the Profitability of the Australian industry for all stakeholders

Project Title:	Improving Deer Industry Profitability through Research Uptake – Pilot Project
RIRDC Project No.:	CAM-1A
Researcher:	Gaye Cameron
Organisation:	G Cameron
Phone:	03 5983 2030
Fax:	03 5983 2030
Email:	camerongaye@hotmail.com
Objectives	<ul style="list-style-type: none"> • analyse the costs of production, and set benchmarks as industry standards. • Address the production issues of meeting carcase specifications and weaning percentages. • Assist farmers to market their products at the optimal time.
Background	Although RIRDC has funded research for deer farming in the past, some farmers have not availed themselves of this information and others have not put the information into practice. This program was planned to assist farmers to take up the research findings so that deer farmers would become more profitable.
Research	A survey was conducted to identify the knowledge and skills that might be addressed to improve production which would lead to more profit. We identified three areas to improve profitability, business bench marking, feeding deer to meet carcase specifications and marketing deer at the optimum time. By implementing the research into nutrition deer farmers are able to meet carcase specifications. Farmers were encouraged to monitor growth rates in order to market stock when prices are at a premium.
Outcomes	After identifying the skills required farmers were invited to join a discussion group. Discussion groups have been the best method of improving production and profitability in other grazing industries. Group meetings followed a simple format of sharing farm activities and past experience as well as introducing new research information. The meetings were held on farm where members could see practical examples and demonstrations. The program ran over two years. Farmers looked at the quantity and quality of the pasture they produced and how they might utilize more pasture. The program followed the annual deer production cycle, this included monitoring condition scores to maximise conception rates. Discussion group members were encouraged to participate in a business analysis workshop. This encouraged producers to look at cost of production. Although only a small number supplied data for the analysis we now have some business bench marks for the industry.

Implications

The awareness of the availability of research information and programs to assist deer farmers to become more profitable has increased. Members in the discussion groups have new skills and are enthusiastic about continuing to implement research results.

Publications

Tuckwell, C. (1998) Australian Deer Industry Manuals RIRDC Publications
Beatson, N. Campbell, A. & Judson, G. (2000) Deer Industry Manual New Zealand Deer Master Project South Canterbury & North Otago Branch
NZDFA
Prograze ® NSW Agriculture
BizCheck for Red Meat ® Enterprise Health Check® Meat and Livestock Australia

Project Title: Deer Production Handbook and Industry Statistics

RIRDC Project No.: DIP-9A
Researcher: Chris Tuckwell
Organisation: Rural Industry Developments Pty Ltd
PO Box 1105
Gawler, SA, 1105
Phone: 08 8523 3500
Fax: 08 8523 3301
Email: cdtuckwell@bigpond.com.au

Objectives

Specific objectives were to continue the improvement of deer farmer profitability by:

- Assisting the commercial application of research results by producing a Deer Production Guide that presents up-to-date technical information and findings of research in a practical and readable form.
- Production of the Deer Production Guide as a PDF file that can, in the future, be linked by hypertext to an annotated bibliography maintained as separate file on a CD-ROM (Note: This project did not budgeted to undertake hypertext linking of documents).
- Ongoing collection, interpretation and reporting of deer industry statistics and databases.

Background

The Australian Deer industry continues to pursue broad community acceptance as a profitable, sustainable Australian Livestock industry. However Australian deer farmers have been slow to adopt improved livestock management, handling technologies and pasture management identified by various research projects. This is in part due to information not being effectively communicated to existing and intending producers. This book will be part of the Industry's ongoing assistance to deer producers that will improve the profitability of their enterprises by understanding existing and new technologies. The book covers a wide range of topics including comprehensive information on industry origins, transport, nutrition, reproduction, pasture management, health, quality assurance programs, handling, body condition scoring, venison production, velvet production, animal selection and the future for the industry. This practical, ready reference manual will provide deer producers with easily accessible information that will encourage efficient and profitable deer management.

The expansion of the industry in Australia will also continue to be dependent on objective collection, interpretation and dissemination of positive market information as well as the development of marketing and production strategies based on accurate records.

Research

Project methodology included:

1. A review of deer research from Australia and throughout the world, to produce a practical easy to read summary of technologies known to improve enterprise and industry sustainability and profitability.
2. The production of 2,000 copies of a book of about 300 pages involved a review of each section of the book by appropriately qualified referees selected for their technical competence and expertise in particular fields

<p>Outcomes</p>	<ol style="list-style-type: none"> 3. The Deer Production Guide is provided to RIRDC and the DIAA as a PDF file that will allow future linking, by hypertext, to an annotated bibliography maintained as separate file on a CD-ROM by a software specialist 4. Maintenance of deer industry contact lists, venison statistics and velvet statistics. 5. Regular and open reporting of market and other information to industry. <p>The 'Deer Farming Handbook' that provides up-to-date practical information on all aspects of deer farming has been printed and is available. The handbook provides Australia's deer farmers with easy access to information that will improve the average performance of Australian deer herds. The Handbook promotes the Deer Industry's National Velvet Accreditation Scheme, provides advice on why it exists, what is involved in obtaining accreditation and how to seek accreditation. It also promotes the Deer Industry's Quality Assurance program, its benefits and how people should seek and maintain accreditation. The 'Deer Farming Handbook' demonstrates the improved returns from improved quality and highlights links that improvement in quality to the adoption of quality assurance program principals and practices. The database of industry venison and velvet statistics has continued its development and statistical data has been collected and reported to industry during the year and in this report</p>
<p>Implications</p>	<p>This report highlights again that the future of the current industry is inextricably linked to demand from international markets over which it has little control and to its ability to produce and market quality assured products that consistently meet consumer specifications. Although other reports have highlighted this fact, to survive, Australia's deer farmers need to receive relatively high returns, compared to other livestock species, for the meat they produce. Keys to consistently high returns include: (i) reducing direct competition in markets; (ii) the development and adoption of Quality Assurance programs that guarantee clients consistently receive product that meets all their specifications, and (iii) boutique marketing in high value markets suited to the scale of production.</p>

Project Title: Generic Investment Proposal Development

RIRDC Project No.: DIP-12A
Researcher: Chris Tuckwell
Organisation: Rural Industry Developments Pty Ltd
PO Box 1105
Gawler, SA, 1105
Phone: 08 8523 3500
Fax: 08 8523 3301
Email: cdtuckwell@bigpond.com.au

Objectives Specific objectives were to develop a business investment plan for the Australian Deer Industry that can be used to attract large corporate and financial institution investment into deer farming and to seek investment on the basis of the proposal.

Background To expand and consolidate the deer industry there is a need to attract new investors.
The Deer Industry Association has approached some superannuation funds that have advised they may be interested in such an investment (superannuation funds invest about 5% of their funds in agribusiness investments) but require a full business plan for evaluation by an independent review company. The plan would need to provide details of a complete purchase/lease package for a large commercial deer enterprise including land, equipment, animals and management.
The total cost of such an investment is likely to be at least \$4 million and will require a complete ten-year financial plan. The enterprise is envisaged as a velvet and venison operation to achieve a dual income stream to offset market fluctuations in each commodity.

Research Project methodology included:
Part A
A review of deer industry statistics from RIRDC funded deer industry development projects and other appropriate papers.
Develop a draft business investment plan for consideration by appropriate industry representatives
Amend the draft plan as required and complete development of the Investment Proposal
Develop a PowerPoint © presentation for use with the proposal
Part B
Develop a dossier of information that can be made available to financial institutions assessing deer enterprise development applications
In association with industry leaders present the proposal to selected investment groups
Provide the proposal to the DIAA to actively seek investment on the basis of the Plan.
The investment proposal package will be provided to leaders of the Deer Industry Association of Australia to allow them to actively seek investment in the industry using the plan developed by this project.

Outcomes	<p>To provide the Australian Deer industry with an investment proposal developed with supportable objective data that encourages new investment in the industry and provides a basis for much needed industry growth. Investment in commercial properties that manage large deer herds will enhance the total industry, as it will strengthen the supply base for venison marketers and velvet processors.</p> <p>The project's Principal Research Officer, in association with industry leaders present the investment proposal to selected financial institution (s) to encourage their investment in the Australian deer industry. These presentations will also be used by to train and give confidence to industry leaders to provide presentations to other institutions in the future.</p>
Implications	<p>This report highlights that the future of the Australian deer industry and new investment in it, is strongly linked to programs of market development. Investors seek opportunities that are market pulled rather than production pushed.</p> <p>Advice from investment analysers suggests an investment proposal such as the one developed by this project is unlikely to successfully attract investment given the relatively high value of the Australian dollar and the fact that the proposers of the investment (DIAA) are not offering hands-on involvement and continual interest in the investment project.</p>

Project Title: A complete guide to deer farming in Australia

RIRDC Project No.: KDI-26A
Researcher: Pamela Horsley– Kondinin Group
Organisation: Kondinin Group Inc.
PO Box 913
Cloverdale WA 6105
Phone: 08 9478 3343
Fax: 08 9478 3353
Email: pamelah@kondinin.com.au

Objectives This project aims to research and report on every area of the Australian deer industry. The report is aimed at farmers interested in farming deer, either as an entirely new enterprise or in conjunction with their existing livestock enterprises.

Background With an estimated gross value of about \$7 million, it is surprising that very few Australian farmers know much about deer farming and the domestic and export opportunities for venison and velvet. This report was written to provide a clear, informative introduction into deer farming in Australia. It covers areas such as latest production methods and technologies, general deer husbandry, marketing options, economics, getting started, breed options, integration with other livestock and farming enterprises and processing.

Research The report topics have been thoroughly researched with continuous consultation with industry experts, including Mr Chris Tuckwell, the RIRDC Deer Research Manager and representatives from the Deer Industry Association of Australia. Case studies have been conducted on existing deer farmers including how and why they got involved in the industry and how they have integrated deer farming with their existing enterprises.

Outcomes The slow growth of the industry has hampered the development deer farming in Australia, but this report shows despite this there are still some large, well-established deer farm operating very successfully. The case studies indicate farms producing both velvet and venison are the most viable, but farmers looking to enter the industry should consider things like location of abattoirs, potential markets and species selection.

Implications This report will be an invaluable tool for farmers looking to get involved in the Australian deer industry as it provides clear, easy-to-read, practical information on all aspects of the industry.

Publications Kondinin Group *Farming Ahead*, March 2004, pp42-57, “Deer farming in Australia – Research Report”.

Facilitate adoption of improved production technologies

Project Title: Dissemination of results of research projects	
RIRDC Project No.:	DIP-13A
Researcher:	Chris Tuckwell
Organisation:	Rural Industry Developments Pty Ltd PO Box 1105 Gawler, SA, 1105
Phone:	08 8523 3500
Fax:	08 8523 3301
Email:	cdtuckwell@bigpond.com
Objectives	<p>To continue the improvement of deer farmer profitability by:</p> <ul style="list-style-type: none"> • Developing and managing a series of seminars to disseminate information and encourage uptake of results of research • Liaising with a representative of the Kondinin group to assist their RIRDC project to increase interest in the deer industry • The ongoing collection, interpretation and reporting of deer industry statistics and servicing the Venstat program
Background	<p>Australian deer farmers have been slow to adopt improved livestock management, handling technologies and pasture management identified by various research projects. This is in part due to information not being effectively communicated to existing and intending producers. The Deer Farming Handbook (DFH) produced by RIRDC project DIP-9A provides a practical, ready reference manual to improve the profitability of deer enterprises by improving understanding of existing and new technologies. This project aimed to provide a series of seminars based on the book, covering a wide range of topics including nutrition, reproduction, pasture management, health, quality assurance programs, handling, body condition scoring, venison production, velvet production, animal selection and the future for the industry. Seminars will provide deer producers with a practical interpretation of results of research that will encourage efficient and profitable deer management. The expansion of the industry in Australia will also continue to be dependent on objective collection, interpretation and dissemination of positive market information as well as the development of marketing and production strategies based on accurate records.</p>
Research	<p>Project methodology included:</p> <ul style="list-style-type: none"> • Promotion of the new DFH and the practical interpretation and application of research findings contained within it. • Development of visual aids and training information from information contained in the DFH to run a series seminars to provide practical interpretations of production related deer research from Australia and throughout the world. • Development was undertaken in consultation with other industry specialists. • Liaison with a representative of the Kondinin group to assist their RIRDC project to increase interest in the deer industry • Maintenance of deer industry venison statistics and velvet statistics with regular and open reporting of market and other information to industry and related agricultural interests.

Outcomes

A set of seven PowerPoint © presentations and associated sets of seminar participant notes were developed for use with the seminars. Notes provide links to relative sections in the DFH. As well, a spreadsheet was developed to assist people understand some of the nutrition research and more easily and efficiently estimate feed requirements of their stock.

The database of industry venison and velvet statistics has continued its development and statistical data has been collected and reported to industry during the year and in this report

Implications

Seminars conducted as part of this project have demonstrated that Australian deer farmers clearly thought that they benefited from the seminars and felt that they were better able to understand the information presented and were more likely to implement new technologies and management practices on the basis of their new understanding. On the basis of this finding it appears the seminars are a valuable tool for promoting, explaining and encouraging the adoption of RIRDC funded research projects.

Statistics suggest that given the relatively stable price received in domestic markets and an apparent demand that peaks in the winter months in Australia, the domestic markets appear to offer market opportunities for the Australian industry

Improve on farm production efficiency

Project Title: Effect of salt intake on feed intake and growth rate of fallow and red weaner deer

RIRDC Project No.: SAR-26A
Researcher: Dr Yingjun Ru
Organisation: South Australian Research and Development Institute
Phone: 08 83037787
Fax: 08 83037977
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.

Background

Over 70% of the total land surface of Australia is arid and semi-arid with only one quarter of the sheep and cattle population using it for grazing. The forage on this land is mainly bushes (e. g. mulga and bladder saltbush), which have a high salt content. An important source of water for grazing animals in the arid zone is underground water with a high salt content. There is evidence that the concentration of total soluble salts in bore water is 10000 to 15000 ppm and sometimes higher in Australian states except for Queensland and the Northern Territory. Salt content in water in summer increases due to evaporation from water troughs and could have a significant impact on animal production by reducing feed intake and influencing other physiological functions. Research on grazing sheep indicates that a content of 13000 mg NaCl/L in drinking water reduces the size of the microbial population and metabolic activity of sheep and 15000 mg NaCl/L decreases feed intake. This high level of salt in the drinking water often causes a reduction in lamb live weight gain and wool production, and can also cause diarrhoea, fly-strike and higher mortality. However, there is no evidence which indicates whether deer production is influenced by high salt intake either in the feed and water in these regions.

Research

To assess the effect of salt level in feed or drinking water on feed intake and growth rate of red and fallow weaner deer, four experiments were conducted over 3 years. The effect of salt level in feed and drinking water on feed intake, water intake and growth rate of fallow and red weaner deer were examined.

Outcomes

- The experiments demonstrated that when fresh water is available fallow deer can tolerate a salt level of 3% in feed while body weight gain is not affected when salt level in feed is up to 6% for red deer (weaner). There is no reduction in feed intake when salt level in drinking water is 1.2% for fallow deer and 0.8% for red deer.
- The data on the tolerance of red and fallow weaner deer to salt level in feed and drinking water can be used as a guideline by deer producers to maximise the profitability of deer farming by reducing the risk of excessive salt intake by grazing deer.
- Deer farmers should monitor the health and behaviour of their deer regularly and test the salt level in drinking water and forage to eliminate the risk of excessive salt intake.

Implications

The data obtained in this study can be immediately adopted by the deer farmers as guidelines for preventing excessive salt intake during the season. Farmers should not feed fallow deer feed/forage containing over 3% salt even if fresh water is available. The salt level in drinking water should be lower than 1.2% for fallow weaner deer and 0.8% for red weaner deer to avoid any reduction in feed intake. To achieve cost-effective venison production, deer farmers need to regularly test the salt levels in drinking water and forage on their farm, especially in dry, hot summers in southern Australia. Farmers also should be careful when using the salt tolerance level of sheep or other livestock species as guidelines for managing red or fallow deer due to the difference in species ability to cope with excessive salt intake.

Publications

- Ru, Y. J., P. C. Glatz and Z. H. Miao (2000). Impact of salt intake on red and fallow deer production in Australia (A Review). *Asian-Australasian Journal of Animal Science*, **13**, 1779-1787.
- Ru, Y. J. M. Fischer, P. C. Glatz, W. K. Peng and Y. M. Bao (2003). Effect of salt level in the feed on performance of red and fallow weaner deer. *Asian Australasian Journal of Animal Science* (submitted)
- Ru, Y. J., M. Fischer, P. C. Glatz and Y. M. Bao (2003). Effect of salt concentration in water on feed intake and growth rate of fallow weaner deer. *Recent Advances in Animal Nutrition in Australia*. Vol. 14, pp. 1A.
- Ru, Y. J. and P. C. Glatz (2004). Effect of salt level in feed and drinking water on performance of red and fallow weaner deer. Proceedings of Australian Deer Industry Biennial Conference, Mount Gambier, South Australia, Australia.

2.3 DEER RESEARCH IN PROGRESS

Improve on farm production efficiency

Project Title	Optimum weaning time for fallow deer in southern Australia
RIRDC Project No.:	SAR-41A
Start Date:	01-Aug-02
Finish Date:	30-Jun-04
Researcher:	Dr Phil Glatz
Organisation:	South Australian Research and Development Institute Davies Building Roseworthy Campus ROSEWORTHY SA 5371
Phone:	(08) 8303 7786
Fax:	(08) 8303 7689
Email:	glatz.phil@saugov.sa.gov.au
Objectives	<ul style="list-style-type: none"> Improved growth rate of weaners during weaning. Improved profitability of deer farming. Disseminating research outcomes to deer farmers by field days, fact sheets, seminars, workshops and scientific publications.
Current Progress	<p>A trial examining the advantages of early weaning versus late weaning was established in 4 paddocks (5 ha) on the Bilby Deer Farm in South Australia in November 2003. Eighty does were allocated to each paddock. Does were weighed in November 2003 and again in March and May 2004. Fawns were weaned early in March with late weaning to occur at the end of June 2004.</p> <p>In March body weight of does in the early weaned treatment were about 4 kg heavier than does in the late weaned treatment but by May this difference was only 0.7 kg. Early weaned fawns were 4-5 kg heavier in March and 2 kg heavier in May than the fawns to be weaned later in the year.</p> <p>Based on higher body weight, the advantages of early weaning were apparent early in the season but these advantages were declining as the season progressed.</p>

Project Title**Restoration of cartilage by novel gene therapy**

RIRDC Project No.:

MAT-1A

Start Date:

30-May-03

Finish Date:

30-May-05

Researcher:

A/Prof Peter Ghosh

Organisation:

Matrix Gene Pty Ltd
Institute of Bone and Joint Research
Royal North Shore Hospital
ST LEONARDS NSW 2605

Phone:

(02) 9926 7239

Fax:

(02) 9906 5368

Email:

pghosh@mail.usyd.edu.au**Objectives**

The project aims to complete the 'Proof of Concept' for restoration of damaged cartilage by novel gene therapy, using gene products originally identified in the cartilage matrix of growing deer antler. The project will include clinical trials in animals and man.

Current Progress

Articular cartilage has little capacity to spontaneously repair the defects caused by traumatic injuries and if untreated this will eventually lead to Osteoarthritis (OA). The medical management of OA has achieved limited progress in the past decades; the drugs currently available suppressing the symptoms rather than improving the underlying pathology responsible for the symptoms.

More recently, researchers have focused on transplantation procedures that offer the potential to repair and restore a new matrix in cartilage defects.

Studies using a unique gene originally identified in the cartilage matrix of growing deer antler have shown that this gene has significant potential to stimulate "self-repair" in mature cartilage, a result not previously thought possible.

A method for stimulating such repair of mature cartilage has the potential to eliminate the need for joint replacement surgery associated with osteoarthritis, a disease affecting nearly 4 million Australians.

The ultimate objective of the present study by Matrix Gene Pty Ltd is to evaluate the potential of the recently discovered gene – DACC-7, as an appropriate means for transfecting chondrocytes which when transplanted into damaged cartilage, would result in a successful repair. DACC-7 was derived from a gene library made from deer antler cartilage cells.

Studies throughout 2003 have clearly demonstrated that transfection of mouse cells with hDACC-7 showed significant, stable, cell proliferation. The next step is to evaluate the hDACC-7 functions in vivo by using the rabbit model. The experimental cartilage defect model will be created surgically by removing damaged tissue from rabbit joints under sterile conditions, establishing cartilage cells in culture and transfecting with the hDACC-7 gene.

The animals will be studied for a period of 8 weeks after which evaluation and analysis of cartilage repair will complete this phase of the project.

Project Title**Study of the Relationship between body condition score, carcass composition and consumer perception of venison quality**

RIRDC Project No.:

UWS-18A

Start Date:

01-Oct-01

Finish Date:

30-May-05

Researcher:

Dr Robert Mulley

Organisation:

University of Western Sydney
School of Agriculture & Rural Development
Hawkesbury Campus
PO Box 1797
PENRITH DC NSW 1797

Phone:

(02) 4570 1438

Fax:

(02) 4570 1383

Email:

r.mulley@uws.edu.au**Objectives**

- A concise overview of the proposal work under the headings of:
- Outcomes and deliverables of the proposed research
- Background, relevance and potential benefits
- Research strategies and methodology
- Communications/adoption/commercialisation strategy
- Time-lines

Current Progress

Data has been obtained from 88 fallow deer that have been slaughtered in body condition score ranges of 2 (lean) to 3 (prime). Results indicate that there is no difference between bucks and havers for the meat quality parameters of intra muscular fat, colour, tenderness and moisture content. There were no significant differences in meat quality parameters between samples collected at 5 days and 10 days post mortem. There were significantly higher levels of fat ($P=0.014$) and moisture ($P<0.001$) in the forequarter loin when compared with mid loin samples. While there was no significant difference between pH and ultimate shear between tenderstretched and Achilles hung carcasses, there was a trend of increasing shear values with increasing pH. Tenderstretched carcasses had significantly lower cooked shear values ($P<0.001$). Sensory analysis and consumer acceptance data is being carried out to test the hypothesis that BCS and venison quality attributes are related to consumer expectation of eating quality i.e., tenderness, juiciness and flavour. The data also indicates that there is a significant difference between freeze/thaw stability of animals in body condition scores of 2 and 3. Score 3 carcasses tended to have higher water losses than condition score 2 carcasses, despite having similar moisture content. It is postulated that cell size within condition score 3 animals may be larger. Significant pH differences were found between three slaughter premises (export, experimental and domestic). Pre slaughter handling and method of slaughter have a dramatic impact on the ultimate pH of carcasses and eating quality. This trial indicates that captive bolt stunning and thoracic stick exsanguination results in carcasses with significantly lower ultimate pH values. Animals held in lairage at the export works were subjected to stresses and noise from working dogs, cattle and sheep held in close proximity. The remaining slaughter plants were used exclusively

for deer with no dogs present. Samples from the export works also showed extensive ecchymosis.

Since the initial design of this study it has become apparent that producers are no longer castrating bucks. The study has turned to examination of does in relation to meat quality parameters. Ten fallow does have been slaughtered. These does will form part of the tenderstretch trial and analysis is currently being conducted. Once completed comparisons may be drawn between bucks and does and the perceived benefits of the tenderstretch method.

Twenty four fallow does have been slaughtered as part of a supplementary feed trial. Twelve of these does have been grazed on kikuyu pasture oversown ryegrass and oats in winter. The remaining animals were fed *ad libitum* barley and lucerne hay. Animals were slaughtered in two groups; Group 1 after 135 days and Group 2 after 170 days of feeding. Samples are currently being analysed to ascertain the effects of feeding, on meat quality. This trial also provided BCS 4 animals for establishing relationships between BCS and eating quality. Protocols established will be applied to red deer venison in 2004/05.

Develop international and domestic markets for Australian venison and develop supply chain management programs

Project Title	An Australian Johne's Disease Market Assurance Program for Deer
RIRDC Project No.: Start Date: Finish Date: Researcher: Organisation: Phone: Fax: Email:	AHA-1A 15-Jun-03 01-Mar-04 Mr David Kennedy Australian Animal Health Council Ltd AusVet Animal Health Services Pty Ltd PO Box 2321 ORANGE NSW 2800 (02) 6365 6016 (02) 6365 6088 david@ausvet.com.au
Objectives	<p>To write the initial draft documentation for a market assurance program for deer for submission to Animal Health Committee's BJD Technical Advisory Group (BJD TAG) and OJD Technical Advisory Group (OJD TAG) and subsequently to negotiate with the deer industry (represented by the DIAA) and the two TAGs any amendments required to obtain the endorsement of industry and Animal Health Committee for the program.</p>
Current Progress	<p>Australian Johne's Disease Market Assurance Programs (MAPs) are voluntary on-farm quality assurance programs that aim to identify, protect and promote herds that are at low risk of being infected with Johne's disease. Since 1996 MAPs have been developed for cattle, sheep, alpaca and goats as core components of programs to reduce the spread of Johne's disease. MAP herds undergo specified testing, risk assessment and management, under the guidance of veterinarian who are trained and approved by the State animal health authority.</p> <p>RIRDC is funding Animal Health Australia to develop a DeerMAP with a working group from the Deer Industry Association of Australia (DIAA). A draft DeerMAP was written in September 2003. It will be finalised when new ELISA and pooled faecal culture (PFC) tests that had been developed under RIRDC project DAV-194A are formally approved by the Sub-Committee on Animal Health Laboratory Standards. It will then be formally submitted to the DIAA and to the national Animal Health Committee for endorsement. When approved it will be published by Animal Health Australia.</p> <p>Deer breeders who are selling stags and replacement females will stand to gain most from assuring their clients of their herd's MAP status.</p>