



# Venison Quality Assurance

**A report for the Rural Industries Research  
and Development Corporation**

by Chris Tuckwell

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# Foreword

The majority (at least 90%) of venison produced by Australian Deer Industry is sold in export markets. This makes the industry especially vulnerable to international market forces over which it has no control (international exchange rates, international import requirements etc) and to international competition from the world's largest industry and close neighbour, New Zealand.

International and domestic market access continues to be compromised by a lack of understanding or acceptance of market requirements.

Producer commitment to programs that overtly demonstrate industry's collective commitment to meeting market specifications of product quality, animal welfare, disease status and absence of contaminants is essential for the immediate and long term future of the industry.

Information produced by this project and contained in this report will, if considered objectively, contribute to the development and future expansion of the Australian deer industry by encouraging a new confidence in the quality and supply of venison it produces.

The written publications produced by this report, Deer Farming Best Practice Manual, Deer Transport Best Practice Manual, Venison Processors Best Practice Manual, and Deer QAMA operating manual are too large to be included in this report. They can however, be viewed on both the RIRDC and DIAA web sites, <http://www.rirdc.gov.au> (see under 'Deer Program') and <http://www.diaa.org.au> respectively. The Deer Industry Association Code of Practice is attached at the back of this report.

This report, a new addition to RIRDCs diverse range of almost 700 research publications, forms part of our Deer R&D program, which aims to foster an Australian deer industry as a profitable and efficient mainstream agricultural enterprise.

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

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

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Managing Director

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Deer Farmers who tested the Deer QAMA program and so contributed to its development were Mr Mark Huisman, Mr Marc and Amanda Reinbott, Mr Rudy Keller, Mr Henry and Mrs Solange Shapiro, Mr Jim Moir and Mr Guy Dockrill.

A special acknowledgment is made to Mr Raymond Kennington B.Sc.(Ma.Sc.)(Hons) Grad.Dip.Ed. B.Comp.Inf.Sc.(Hons), of Programming Solutions, without whose generosity and commitment to the project, this software would not be available.

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# Executive Summary

Industry leaders continually encourage domestic and international users of the Industry's products and services to, where possible, preferentially purchase from suppliers who are accredited by the industry Quality Assurance program and use the industry accreditation marks to demonstrate their commitment to quality.

The Australian Deer Industry QA program is one of the projects that are designed and planned to help guarantee market access for your 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.

While Quality Assurance may not necessarily guarantee a premium price for products, but it may well guarantee market access for product.

This project has helped ensure the credibility and acceptability, by the marketplace, of the Australian Deer Industry QA program, as a reasonable guarantee of food safety and commitment to animal welfare.

All Australian Deer industry members are encouraged to adopt the industry QA program and in turn help guarantee markets access for those sectors of industry concerned with marketing their products that in turn will help guarantee the industry's sustainable and profitable future.

The written publications produced by this report, Deer Farming Best Practice Manual, Deer Transport Best Practice Manual, Venison Processors Best Practice Manual, and Deer QAMA operating manual are too large to be included in this report. They can however, be viewed on both the RIRDC and DIAA web sites, <http://www.rirdc.gov.au> (see under 'Deer Program') and <http://www.diaa.org.au> respectively. The Deer Code of Practice is attached at the back of this report.

All those who currently hold registered Deer Industry Quality Assurance program manuals will receive appropriate manual updates and a free copy of the Deer QAMA program when funding for their duplication and distribution becomes available. New applicants for Deer industry QA accreditation will receive appropriate copies of updated manuals and a free copy of the Deer QAMA program.

All copies of the Deer QAMA program are accompanied by an electronic and hard copies of the operating manual.

# Introduction

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.

Investigation of 'niche' market opportunities for Australian venison in domestic markets and the development of strategic alliances based on regular supply of quality assured product appears to offer, as yet, un-developed market opportunities for the Australian industry. Part A of this project proposed the targeting of Australian regional tourism domestic market opportunities to encourage the use Australian product in preference to New Zealand product.

The report of Part A of this project suggests that returns to producers and processors should improve from a targeted value based marketing approach to individual niche markets. Entry into some markets with a preference for fallow venison would have an advantage over major competitor pricing strategies. Development of highly specific cuts/packs for a small but high value market would allow forward contracts and will be further enhanced by the Australian Quality Brand (currently being registered).

Original objectives of the second year of the RIRDC project DIP-3A were to:

- Develop cuts and packaging/presentation appropriate to individual niche market needs and
- Prepare food service guide-books for most suitable uses and methods for
  - (a) Selected fallow venison cuts and
  - (b) Selected red/rusa venison cuts.
- Continue to initiate development and coordination of industry serving markets on a basis of supplying any Quality assured product.

However, none of the operating domestic processors and marketers of venison supported the concept of Food Service guidebooks as proposed by the project. There were common reasons for lack of support for the guidebooks that generally related to individual processor/marketers indicating that they know their own customer needs and that the variation in customers needs means that the guidebooks would have limited application.

Although researchers of who undertook part A of the project still consider that a food service guide book for users of venison has merit and would be a useful marketing tool, particularly for: (i) introducing new chefs to venison and: (ii) providing information on its nutritive value and appropriate cooking methods for specific meat cuts, domestic marketers did not support expenditure of levy fund in that way.

Adoption of the deer industry QA program is only occurring slowly. One of the most significant reasons for the reluctance of industry people to consider QA accreditation is their discomfort with paper work and record keeping associated with QA accreditation.

Researcher assessment of the Deer industry QA program suggested that it was timely to consider upgrading and amendment of industry QA manuals, particularly:



- In respect to a need to include Hazard Analysis and Critical Control Point (HACCP) program in each manual, and;
- In recognition of the soon to be available industry venison and velvet antler QA brand marks.

Amendments to project objectives proposed and accepted were:

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

Project amendments were considered to take responsible consideration of the Australian Deer Industry's changing status and represent an informed approach to industry development issues.

The amended project, still seeks 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.

# Objectives

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

Specific objectives were:

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

# Methodology

All objectives were under taken, at least to some extent, concurrently.

## **Objective 1**

Ongoing negotiation and liaison with processors for their active support of the industry QA program with farmers, encouragement of processors to use of industry developed quality assurance marks and researching and reporting of farmer return variations between ideally prepared stock and others offered for processing.

## **Objective 2**

In association with an accredited QA and HACCP specialist, review and update all industry QA manuals

## **Objective 3**

In association with a computer programmer develop computer database program that will allow easy recording, storing and reporting on all information required by QA accredited businesses.

## **Objective 4**

To review, update and rewrite the partially updated Deer Industry Code of Practice

# Results

## Support for the Deer Industry Quality Assurance Program

This project has provided ongoing encouragement to all in the deer industry of the need for quality assurance accreditation through industry publications and various forums. Domestic and international users of the Industry's products and services are continually encouraged to, where possible, preferentially purchase from suppliers who are accredited by the industry Quality Assurance program and use the industry accreditation marks to demonstrate their commitment to quality.

The impending release of the distinctive industry quality assurance accreditation marks will provide those who receive accreditation by the industry quality assurance program with an ability to advertise their product and services as quality assured in the market place.

## Updated Deer Industry Quality Assurance Manuals

All deer industry QA manuals (Deer Farm Best Practice Manual, Deer Transport Best Practice Manual, Venison Processors Best Practice Manual) have been updated and now include appropriate HACCP sections within each manual.

The Deer Industry Quality Assurance Board and selected industry participants have reviewed the new manuals.

## Computer Program (Deer QAMA)

A computer database program called 'Deer Quality Assurance Management and Analysis' (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 has been developed.

An operating manual has been written for the program and will be provided to users as a Microsoft Word ® file and as hard copy document.

Industry members in each state who helped identify minor problems in the operation of the program have tested the program over several months.

## Deer Industry Code of Practice

A new Deer Industry Code of Practice has been written and provided to the Australian Animal Health Council through the Deer Industry Association of Australia.

# Discussion Of Results

## General

To meet broad market and individual client expectations, the Australian Deer Industry must actively continue its amendment of its Quality Assurance programs that guarantee clients consistently receive product that meets all of their specifications.

The Deer Industry QA program continues to evolve, as it must, to ensure that it remains relevant to the international and domestic communities that consume the Industry's products.

Key components of the Deer industry QA program are food safety and animal welfare and the program expects that each person in the production chain takes responsibility for and documents, all activity that occurs during the stage of production that they control. Standards addressed by the Deer industry QA programs cover a wide range of food safety risks and include consideration of issues including: antibiotic residues; broken needles; drug withholding periods; safety of supplementary feed and meat hygiene. Animal welfare issues considered include provision of: adequate shelter; adequate feed; handling facilities; veterinary care; transport facilities and accredited velvetting practices.

Producers and processors continue to be informed that Quality Assurance may not necessarily guarantee a premium price for products, but it may well guarantee market access for product. Processors are continually being encouraged to support the program and to encourage producers to seek accreditation by the program.

Producers are being encouraged to consider that in the near future, it is likely that unless a product meets a minimum (externally audited) quality standard, market access will be limited. However, as positive support for the program, most industry groups who adopt quality assurance programs notice an improvement in profitability through an improvement in management control.

Updated program manuals for farmers and transporters combined with the computer data base program (Deer QAMA) have been developed to ease the tedium associated with data recording required by the program. The program will be supplied at no cost to all those who seek quality assurance accreditation.

The National Deer Industry Code of Practice developed by industry further emphasises to clients, governments, other industry groups and agribusinesses the commitment of the Australian Deer industry to all aspects of Quality Assurance.

## Development of the Deer QAMA Software and Suggestions for Future Enhancements

Raymond Kennington from Programming Solutions, the company that developed Deer QAMA, produced this section of the report.

Deer QAMA stands for *Deer Quality Assurance Management and Analysis*. It has been produced for deer farmers in Australia who participate in the quality assurance program. Programming Solutions produced Deer QAMA for the Deer Industry Company, who funded the project, with Chris Tuckwell, Director of Rural Industry Developments, specifying and guiding the software development.

## Contributions by Programming Solutions

In addition to developing the software, Programming Solutions provided input into the requirements of the quality assurance program including:

1. The need to include a date-time field with each change and the username of the person who made the change. This makes it clear who was responsible for making the change, and where there is greater responsibility there is likely to be greater care taken to ensure the correctness of data.
2. The use of lookup tables for fields that are used to search or report on.
3. The need to allow for multiple transports (companies, drivers and trucks for a single shipment).
4. Needing more precise times for all events for greater accuracy of reporting.
5. The need to separate the animal numbers into two separate fields, namely colour and number.
6. The need for an independent ID for animals that is unique since colour+number is not unique.
7. The rewording and other changes to the *pasture management record*.

Programming Solutions also produced a formal article titled *Is a Selected Animal in a Withholding Period due to a Farm Chemical Treatment*. The document is nine pages in length and describes, through tables and a formal scientific notation, the algorithm required to determine whether or not one or more animals is in a WHP due to a farm chemical treatment *at any point in time, past or present*. This is a complex process.

Deer QAMA is a complex program. Its most complex features include its ability to:

1. Alter movements of animals historically within the allowable space and time constraints created by prior and future movements.
2. Determine whether any animal is affected by a farm chemical withholding period at any point in time.

This program contains:

1. More than 30,000 coded functions and properties set.
2. 102 tables and 396 index files.
3. About 60,000 lines of code produced by Programming Solutions.
4. 77 source code units and 74 forms.
5. 82 reports.

Several supporting programs were created to assist the development of Deer QAMA including programs to:

1. Empty the tables;
2. Populate all tables;
3. Populate selected table;
4. Stamp the application with a protection mark.
5. A registration database system was modified and enhanced for this application.
6. Update the date that the beta system was licensed to.
7. Add passwords to tables.
8. Remove passwords from tables.
9. Write the volume serial number; required because WIN 2000 provides it in a different way to prior MS-Windows operating systems.

Other activities undertaken by Programming Solutions with respect to Deer QAMA include:

1. Manipulation of images of deer, the DIC logo etc.
2. Suitable icons had to be sought via the Internet; a program was purchased to manage these.
3. An installation program was created for beta testing.
4. An installation program was created for final installation.
5. An installation program was created for the BDE (Borland Database Engine).
6. The keys for the trial and registration system had to be managed.

During the development of Deer QAMA, Programming Solutions has:

1. Managed software development.
2. Produced a rough requirements specification.
3. Designed the database for information system.
4. Architected a model of the system.
5. Liaised with Rural Industry Developments during all phases of development.
6. Created an entity-relationship diagram of the database.
7. Selected appropriate software tools for developing *this* information system.
8. Produced a large database of data with specific tests in mind to cater for all boundary conditions; especially required for testing any process that requires dates.
9. Verified that it was being built right.
10. Incorporated Quality Assurance processes into the development of the software.
11. Implemented the information system.
12. Tested the software.
13. Validated the product against requirements at all phases of production.

### **Additions to the Original Specification**

At least the following has been included even though they were not part of the original specification.

1. Multiple locations for drugs, farm chemicals and feed.
2. Multiple items used from multiple locations for a drug or farm chemical treatment or feeding.
3. Multiple transports (companies, trucks, and drivers) for purchases and sales.
4. "A few simple reports" has extended to over 80 reports, some of which are quite complex.
5. Able to change data in the past.
6. Colour and Number is not unique.
7. Significant additions to the Vendor declaration form.

### **Payment for the Project**

Although this is a significant computer program (time for development and complexity), the fee paid to Programming Solutions was only \$10,000.

Time invested in this project by Programming Solutions was about twenty weeks (800 hours) so the contract fee earned was about \$12.50 per hour with no consideration of overhead costs including software and hardware.

A reasonable fee for this project should have been about \$48,000 + GST or a realistic contract rate of \$60.00 per hour.

This reasonable rate must be considered by the deer industry when considering the need not only to enhance this software, but also to put it onto a more stable footing for *all future time*.

### **Future Development of the Program**

The application *Deer QAMA* is a tool that has been extremely well liked by those people (beta testers) in industry that donated their time to assist the testing and evaluation of the program. This suggests that the software *will* be used.

Although the current application has been validated against the agreed-upon criteria for the software to enable the functionality of the quality assurance program, during evaluation, the beta testers and Rural Industry Developments suggested program enhancements.

Examples include a requirement to account for missing animals that are presumed still in a paddock rather than having escaped and the addition of *weight* as a field and all the reporting and testing requirements for it.

The first version of any product can always be improved in the way it operates. More importantly, the world that has been used as a model for the program changes over time. For example, suppose it becomes requirement by an export country that animals not be bottle-fed; then it would be necessary to add some fields, tests, reports and warnings. Perhaps it could become necessary to track international transport; these have different issues associated with them than trucks.

With projects of this kind, that is software applications that are providing a solution to a real need and will be used intensively over a long period of time, it is necessary to establish a foundation from which a sound development environment can be created.

One of the most important aspects of a future version of the Deer QAMA program is to document it the program itself. Currently there is no documentation of the program requirements, the design, analysis, code, testing, or anything else. There is no equivalent to the architectural documents (eg. a blue-print) for building a high-rise office block. For example, the side effects of changes to the program have not been documented and so it is dangerous to undertake any changes to the current program.

This project should be produced using *Quality Assurance* itself. According to Australian Standard for *Software quality management system Part 1: Requirements*<sup>1</sup> dozens of processes should be used that were not used in the development of the current system.

With adequate funding the software could have been developed according to appropriate QA standards that require a sound, documented set of procedures for handling development and change; this would minimise risks to future program changes and assist with the identification and correction of minor faults.

Computer program development fees should include a consideration for maintaining the knowledge associated with the product to enable future program development and enhancement.

### **Costs of Future Development**

The time estimated to undertake all of the changes and enhancements described below is 2,000 hours that equates to an estimated contract fee of \$120,000. This

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<sup>1</sup> Australian Standard AS 3563.1 - 1991



would cover all costs including the salaries of three people working for six months. The skills required include:

1. Technical writing (for the online Help file).
2. Project Management.
3. Documenting all aspects of the current system.
4. Software Engineering.
5. Systems Analysis.
6. Quality Assurance and Control.
7. Formal Software Testing.
8. Architecting a database.
9. Programming.
10. Liaising with users.
11. Designing test databases.
12. Change Management.
13. Knowing the use of the many tools.
14. Report writing (to the funding body).
15. Installation and maintenance of computers and software.
16. Communicating with tool developers about their bugs, enhancements and understanding the use of their tools.

One way to obtain this amount of money is through license fees to large numbers of users. For example, 200 users could pay \$600 each and 1,000 users could contribute \$120 each. I suggest setting up a licensing system whereby users of the software pay \$100 per annum for ongoing maintenance and enhancements *after* the initial major work has been completed; this figure would depend on the number of users involved.

Another source would be to sell the software in other countries. For example, if 1,000 users in New Zealand wanted to lease the software, then charge them each \$100 and you have a sufficient amount to get started, but you would need to get enough to agree and pay in advance before the work is begun.

## Future Development Requirements

### Software Development and Design

- (a) Use Software Engineering and Software Quality Assurance Processes.
- (b) Convert to a Client/Server database: Interbase.  
There are several situations in this application that could go wrong if there were a power failure between two parts of a transaction. Also when a table is open and there is a power failure the tables could become corrupted.  
  
For example, updating the Animal and Movement tables after saving a Death, Escape or Sale Animal record.
- (c) Transaction processing techniques should be used. For example, Purchases and Sales should be posted as a whole.
- (d) Produce a *Requirements Specification* - there isn't one!
- (e) Produce a formal test specification.  
Includes hundreds or possibly thousands of test databases.
- (f) Produce a test application that uses a database.  
This is essential for re-testing after making changes.
- (g) Document the system scientifically: requirements, analysis, design, source, etc.  
Included would be to document the dependencies between various parts of the program so that one knows what must be checked and perhaps altered when changes in one place are made. At present only one person knows this. There is no reference material whatsoever on this.
- (h) Making it multi-user for use on larger properties.

- (i) Store the *Business Rules* in the database rather than code and use exception handling.
- (j) Use and display only one field for date and time.
- (k) Filter the queries before fetching the records using a client-server database.
- (l) Use a *data module* for queries and tables that are used repeatedly.
- (m) Close tables when running queries on the tables.  
This is to avoid the lock file problem (growing too large). Then

LOCAL SHARE can be set back to True (for updating posts to disk as fast as possible).

This would be redundant if a client-server database like *Interbase* or MS-SQL were used.

- (n) Showing all the data in a table is not efficient; only a requested subset should be shown.
- (o) Use separate threads for long processes.
- (p) Packing main tables requires undoing/redoing RefInts.

### General Enhancements

- (a) Online Help with context-sensitive references.
- (b) Save the state of grids.
- (c) Convert MessageDlg to a MessageBeepDlg.
- (d) Resolution Independence.
- (e) Allow resizing of the forms.
- (f) Better messages for BDE errors like *key error*.
- (g) Use a date/time picker that has times available too.
- (h) Check Age >= 0 before accepting date changes or new dates.
- (i) User-specification of the order of fields.

- (j) Date Validation Checks:
  - (1) Sale Date < Treatment Date;
  - (2) Sale Date < Movement Date;
  - (3) Death < Move;
  - (4) Escape < Move;
  - (5) Treatment > Death;
  - (6) Treatment > Escape;
  - (7) Treatment > Sale.
- (k) Define/Save/Load filters.
- (l) Speed up the places where the process is slow.
- (m) Design and implement an automated backup procedure;

### Specific Enhancements

- (a) Animal Form
- (b) More information on why an animal cannot be deleted;
- (c) Filter Sire & Dam (separately);
- (d) Change breed -> could check if valid with breed of parents;
  - (1) Disallow changing DamID to 0 in an edit - or update the initial Paddock;
  - (2) Check DOB for Sire/Dam and Animal is consistent;
- (e) Chemical Inventory
  - (1) Show a flag of chemicals past expiry date;
- (r) Chemical Treatment
  - (1) Could try nesting the IsInChemicalWHP and making it live;

- (2) Allow use of chemicals past their expiry date;
- (s) Death
  - (1) Date should be DateTime; A dead animal could have been moved in the morning and died later in the day. Purchased animals may be DOA.
  - (2) Drug Description  
Disallow edit/deletion of HGP; Who purchased animals that used a specified drug?
- (t) Drug Inventory
  - (1) Show a flag of drugs past expiry date;
- (g) Drug Treatment
  - (1) Filter by Paddock;

- (2) Show current paddock if inserting;
- (3) Show paddock at the time if editing when editing;
- (h) Escape
  - (1) Date should be DateTime. An escaped animal could have been moved in the morning and died later in the day.
- (i) Move Past
  - (1) Print selected animal records;
  - (2) Keep track of Paddock moves to make group moves easier to change;
  - (3) Show if the Animals have moved somewhere else;
  - (4) Report on the deletions, changes, group moves and other moves;
  - (5) Create a new move in the past;
  - (6) Sort history;
  - (7) Warn if intend moving to a paddock in a WHP;
  - (8) Better to show which paddocks are in a WHP when the movement forms are displayed;
  - (9) Paddock
  - (10) Which paddocks are in a chemical WHP?
  - (11) History of chemical WHP's for a paddock;
- (12) Print list of restricted paddocks at a specified time;
- (j) Purchase
  - (1) Post all or none instead of interacting with other tables immediately;
  - (2) Allow buying animals in a WHP;
  - (3) New fields for the relevant WHP details;
- (k) Supplementary Feed
  - (1) Need a Date, Time field to sequence the events of filling up a Silo;
- (l) Sale
  - (1) Printing the Paddocks;
  - (2) Select all of one Paddock or more than one paddock for the sale of all animals in the selected paddocks;
  - (3) Post all or none instead of interacting with other tables immediately;
  - (4) Select all of the filtered set for sale;
- (m) Supplementary Feed
  - (1) Specify which feed corresponds to by-product stock feed and determine which animals were subjected to it;
- (n) Vendor Declaration Form
  - (1) Have the program take care of the by-product list;
  - (2) Improve the output;

### **New Features associated with the QA program.**

- (a) Transfer records of drug treatments and exposure to farm chemicals from one owner to another.
- (b) Group selection of animals for sale.
- (c) Specify a WHP for purchased animals.
- (d) Allow a purchased animal DOA to be entered as died on the same day as the purchase.
- (e) Escapes and Deaths should have *time* as well as *date*.
- (f) Direct report of drugs and farm chemicals past the expiry date.
- (g) Allow multiple tags with different numbers and be able to search on all these numbers.
- (h) Sex can change from M to C. Store date when castrated. This has consequences for other parts of the system. For example, when searching for events that occurred in the past for all males when some of those might now be castrates or vice versa.
- (i) Initialise the Database.
- (j) Allow multiple disposal dates for drugs and farm chemicals.
- (k) To Do list for management processes.

- (l) Allow drawing of farms and use these to visually manipulate data and display results.  
Selecting Farm regions for:
  - (1) Movement;
  - (2) Inspecting Properties of Animals;
  - (3) Colour-coding if treated;
  - (4) Showing numbers of animals;
  - (5) Date vacated.
- (m) Maybe the WHP depends on time-point in the RAP that animal enters a restricted paddock.  
Could also depend on when it leaves, or the duration of contact.

*Other New Features.*

- (a) Store the animal weights and manage, query and report on them.
- (b) Incorporate effects of feeding too little, too much, etc.
- (c) Interlink other aspects of farming:
  - (1) Expenses;
  - (2) Income;
  - (3) Budgeting.
- (d) Add *missing animal* functionality and all that it entails.

**Conclusion**

In summary, this is a great product that does the job it was designed to do but the budget was minuscule in comparison to both the effort involved and the future use of the product.

This may give an impression that a similar amount of money will guarantee enhancements for and future viability of Deer QAMA. This is entirely incorrect. Initial project funding is not enough to *document* the current system.

Programming Solutions had every right to have enforced the original contract and limited development of the program to it, which would have resulted in an unusable program. Programming Solutions did what was good for the deer industry.

Finally, as this application has been produced to meet any quality assurance standard (budget limitations), the use of it as part of the deer industry quality assurance program may nullify the very program it was developed to for. I suggest that the Deer Industry treats this system as a prototype only and use it in the field with full knowledge of the notes of caution included in this report.

When it is considered that this program manipulates millions of dollars worth of data and that the reputation of the Deer Industry will depend on this software I am sure the industry will find a way to adequately fund the real thing with real money.

# Implications

Industry leaders will continually encourage domestic and international users of the Industry's products and services to, where possible, preferentially purchase from suppliers who are accredited by the industry Quality Assurance program and use the industry accreditation marks to demonstrate their commitment to quality.

The Australian Deer Industry's QA program is one of the programs 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.

A future development of the Deer QAMA program would include all options suggested by the computer programmer and be a more robust and useful program.

# Recommendations

Industry commitment to its QA programs is evidenced by its commitment to rewriting existing manuals including the recognition of HACCP requirements and the production of a computer record-keeping program for farmers who adopt the program.

Industry must now seek to reproduce manuals, both in electronic and hard copy formats for distribution to existing manual holders and for new QA accreditation applicants.









**Deer Industry  
Association**

**CODE OF  
PRACTICE**

**FOR THE  
WELFARE OF DEER**

**June 2001**

## **Disclaimer**

Information contained in this publication is subject to periodic review in consideration of changing deer management practices, government requirements and regulations. No subscriber or reader should act on the basis of any such information without referring to applicable laws and regulations and/or without seeking appropriate professional advice. Although every effort has been made to ensure accuracy, the Deer Industry Association of Australia (DIAA) shall not be held responsible for loss or damage caused by errors, omissions, misprints or misinterpretation of the contents hereof. Furthermore, the DIAA expressly disclaims all and any liability to any person in respect of any activity undertaken or not undertaken, by any person in reliance on the contents of this publication.

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# Preface

Codes of Practice are nationally developed guidelines for the care and handling of the different species of farm animals. The Codes contain recommended housing and management practices for farm animals as well as transportation and processing.

The Codes are voluntary and are intended as an educational tool in the promotion of sound husbandry and welfare practices. The Codes contain recommendations to assist farmers and others in the agriculture and food sector to compare and improve their own management practices.

**This Code applies to all farmed deer although it is not intended to apply to feral deer that may be on agricultural land but are not within the occupier's control**

This Code of Practice is a model developed by the Deer Industry Association of Australia (DIAA) to set out guidelines for persons responsible for the welfare & husbandry of farmed deer.

The document was developed with the available information and with reference to the Canadian Code of Practice for the Care and Handling of Farmed Deer, the UK Code of Recommendations for the Welfare of Farmed Deer, the New Zealand Quality Assurance Program, The Australian Deer Farming Best Practice Program and The Australian Deer Transport Best Practice Program.

The DIAA recognises that this publication must respond to changing technologies, scientific discoveries, and cumulative industry experience. To meet Industry needs this Code is subject to periodic review in light of improving management technologies, husbandry practices, government requirements and regulations. This Code will remain a 'living' document that will be continually be amended to reflect these changes.

The recommendations of this Code of practice establish criteria promoting high standards of animal care and welfare. This Code supplements government legislation and Australian deer industry Quality Assurance programs.

Any submissions for change should be forwarded to:

The Deer Industry Association of Australia (DIAA)  
PO BOX 37  
LISMORE VIC 3324

# 1. Introduction

Deer are farmed principally for the sale of live animals, venison (meat) and velvet antler. Deer are raised for a variety of purposes in a variety of production systems. Red deer and fallow deer are currently the most widespread species used for farming in Australia.

This Code focuses on husbandry of farmed deer with particular reference to Red and Fallow although the needs of other species such as Wapiti (Elk), Rusa and Chital deer are generally covered by the Code.

Deer are adapted behaviourally and physiologically to regional environments throughout Australia.

Common commercial species (red deer, fallow deer, wapiti and chital deer) are gregarious mixed-feeders whose feeding requirements guide deer farmer's selection of species, pastures, facilities and husbandry systems.

**The welfare of deer can be safeguarded and their behavioural needs met under a variety of management systems. The system, the number and stocking rate of deer kept at any one time depends on the suitability of the conditions and the skill of the stockman. All stockmen should be familiar with the behaviour of deer and must be competent in their handling and management to safeguard the welfare of the herd and individual animals.**

**Badly managed deer do not thrive and the stockman needs to watch for signs of disease or distress. The good stockman will be able to recognise trouble at its early stages and may be able to identify the cause and put matters right immediately. If the cause is not obvious, or if the stockman's immediate action is not effective, veterinary or other expert advice should be obtained as soon as possible.**

The Australian deer industry recognizes the need for a National Code of Practice that addresses issues of animal welfare in balance with normal farm management requirements. In the development of this Code, consideration is given to:

1. Physical and behavioural needs of farmed deer
2. Humane treatment
3. Human safety
4. Ease of animal management, and
5. Farm profitability.

## 2. Producers' Skills and Responsibilities

### 2.1 General

- (a) People working with deer must understand and accept responsibility for the welfare of deer under their care.
- (b) Because some species of deer have a nervous disposition, caution and good stockmanship is required to prevent injury to deer and stockmen. Sick, injured and diseased deer should be given prompt and appropriate treatment or slaughtered immediately.
- (c) Employers have an obligation to train employees properly on humane handling, equipment use, and livestock care and to ensure that employees follow those principles at all times.
- (d) Prior to assignment of duties, personnel must be adequately instructed on the basic seasonal needs of deer under their care according to species, gender and age. A working knowledge of the behaviour of deer combined with adequate facilities are necessary to ensure safe handling. Procedures must be reviewed and practised to ensure competency and safety.
- (e) Signs of poor health may be subtle. Personnel must be able to recognize behavioural signs that indicate discomfort or disease and respond quickly to the need to consult a veterinarian. Appropriate preventative treatments should be administered to deer to prevent disease conditions that are common in the district or are occurring in the herd. Veterinary help should be sought to diagnose the disease and initiate proper treatment.
- (f) Projectile syringe equipment should only be used by licensed, trained and experienced operators. They should not be used routinely as an alternative to properly designed handling facilities. The preferential method of restraint is physical restraint in a purpose built deer crush within purpose built deer handling yards. In emergencies, chemical restraint using delivery systems such as pole syringes may be necessary. However, small deer may be injured by projectile syringes discharged from firearms, particularly at short range
- (g) Producers must ensure adequate handling facilities and fences.

### 2.2 Cruelty and neglect

**It is unacceptable for any person to:**

- (a) Mistreat any animal under his/her care and attention.
- (b) Neglect any animal so that it experiences pain, suffering or distress.
- (c) Fail to supply any animal with adequate resources to maintain the live weight of the animal within the normal physiologic range for the species type, age, and gender relative to the time of year.
- (d) Remove velvet antler without adequate analgesia.



- (e) Slaughter, confine, handle or transport any animal in a manner causing avoidable pain, suffering or distress.
- (f) Keep alive any animal that is in pronounced physical or psychological discomfort unless it is under the direct care of a licensed veterinarian.

### **2.3 Identification and records**

**Health and production records should be maintained. Each animal should be easily identified to its property of origin.**

Useful records include:

- (a) Pedigree
- (b) Acquisition/disposition
- (c) Birth date
- (d) Weaning date and weight
- (e) Date and nature of any treatment or medication
- (f) Breeding history
- (g) Velvet records.

# 3. Animal Considerations

## 3.1 Food and Water

### 3.1.1 Food

- (a) Deer have a typical ruminant digestive system requiring similar nutrient and micronutrients to other ruminant animals such as cattle and sheep.
- (b) The quality and quantity of the diet of farmed deer should be adequate to maintain health and meet the requirements of growth, pregnancy, lactation and cold stress appropriate to the species, age, gender, reproductive status and environmental conditions.
- (c) The appetite of deer may be depressed in winter, and weight loss normally occurs during this period. Deer should be well fed in summer and autumn so that they are in good body condition by the end of autumn in preparation for winter.
- (d) Deer should be protected as far as possible from toxic plants and foreign materials damaging to their health.
- (e) When group feeding it is important to ensure that all animals (with special attention to subordinate animals) obtain adequate amounts of feed.
- (f) Changes in diet must be made gradually to prevent digestive problems or potential death.
- (g) Feed must be free of spoilage. Unusual feedstuffs should only be offered with care until when research has shown no adverse effect on animal health or the safety of the final product.
- (h) Feeds should be stored in an appropriate manner to reduce growth of moulds and contamination from rodents, birds and insects. Feed quality, particularly vitamin activity, will deteriorate during storage. Manufacturers expiration dates must be respected.
- (i) When feeding baled forage, twine and wrap must be removed to avoid illness or death from ingestion or injury from entanglement.

### 3.1.2 Water

Deer require free access to an adequate supply of good quality water.

- (a) Water reticulation systems should be inspected regularly for normal function preferably daily during summer and at least weekly during winter. Under extensive grazing systems, storage systems should be large enough to facilitate less frequent inspections.
- (b) Where dams or waterholes are the main source of drinking water measure should be taken to minimise faecal contamination.
- (c) Water requirements vary widely according to species, body weight, temperature and type of diet. As a guide, lactating animals on dry summer pasture require up to 10 litres (Fallow Deer) or 20 litres (Red Deer) daily.

### 3.1.3 Drought

- (a) Drought conditions may be defined as a severe rainfall shortage resulting in a lack of pasture feed and/or drinking water resulting in excessive weight loss or death.

- (b) During drought conditions supplementary feeding should be offered at least every third day and the herd observed carefully for weak or recumbent animals that may need to be segregated for special treatment.
- (c) Deer too weak to stand and walk should be slaughtered on site or provided with emergency veterinary care. Methods of humane destruction are given in Section 6.
- (d) Where the requirements of food or water to sustain health and vitality cannot be met, deer should be moved, agisted, sold for slaughter or slaughtered on site.

### **3.2 Protection From Climatic Extreme and Predation**

- (a) In general deer are less capable of maintaining their body temperature in the face of climatic extremes than cattle or sheep. Tropically derived species such as Rusa deer are particularly prone to cold stress.
- (b) Farmed deer should have access to sufficient shelter and shade to prevent cold stress or heat stress. Bush and other shelter in paddocks can minimise climatic stress.
- (c) Newborn deer have poor thermoregulatory mechanism. Therefore deer calving in winter in cold climates should have access to paddocks with long grass or shelters. In summer, calving deer may require shade.
- (d) Protection from predation by dog packs may be required. Electrified out rider wires may be useful.
- (e) In the event of fire or flood, deer should be attended to promptly to minimise injury and pain.
- (f) Fawning/calving paddocks should be clean, well drained and away from disturbances. Appropriate cover provides shade and keep fawns/calves away from fence lines

### **3.3 Handling**

#### **3.3.1 General**

- (a) Deer should be handled quietly with care and patience. Familiarization of deer with handling facilities and a management routine from an early age reduces animal apprehension and improves the ease of management.
- (b) Facilities for deer should be designed with due regard to the behavioural patterns of deer as a prerequisite for ease of handling and reducing risk of injury.
- (c) There should be enough paddocks to permit animals of similar age, sex, size, and compatibility to be grouped and to allow separation of incompatible groups where necessary at certain times of the year.
- (d) Overcrowding of deer results in competition for food, water, and space that may lead to fighting and the risk of injury.
- (e) As aggressive behaviour is mainly a problem with male deer in hard antler, deer on farms should not be allowed to carry hard antler.
- (f) Care should be taken to either avoid handling deer during the rut (normal period of hard antler) or to use facilities that decrease the risk of injury from fighting.
- (g) Deer require social interactions with members of their own species. Single animals should not be confined alone for more than a short period except for quarantine or management purposes.

- (h) Fencing should be high enough to prevent escape and of a design which minimised the risk of injury. Good fencing adequately maintained also minimised the risk of predation.
- (i) Farmers have an obligation to prevent deer from escaping and must ensure fencing does not allow this.
- (j) The provision of subdued light in the drafting pens and handling facility may reduce stress and assist the handling of deer.
- (k) To avoid risk of injuries deer should be handled quietly so they do not panic and seek escape from a yard or other restraining facility.

### 3.3.2 Handling Facilities

There are a wide range of satisfactory designs and layouts suitable for Deer handling facilities. It is recommended that new farmers seek specialist advice before constructing new facilities. See section 4.4 for more information.

### 3.3.3 Handling Males

- (a) Adult stags must be considered as potentially dangerous at all times and their handling during the rut should be kept to a minimum.
- (b) Especially during the rut, males may be dangerous and must be treated with respect. Hand-reared animals are particularly dangerous, due to their lack of fear.
- (c) Antlers should be removed to help:
  - Avoid risk of injury to themselves and other deer and people
  - Reduce damage to facilities, and
  - Allow easy access to feeding facilities and watering systems.
- (d) Antlered and antler-less males should be separated, especially during the rut.
- (e) Generally, deer in “hard antler” should not be yarded with other deer and should be penned singly in facilities that limit movement or space.

## 3.4 Management Practices

### 3.4.1 General

- (a) A high degree of competence in the performance of farm management practices should be sought to minimise injury and maintain health and vitality.
- (b) Restraint used on deer should be only necessary to efficiently carry out a procedure.

### 3.4.2 Restraint

- (a) Restraint is required for procedures such as tagging, velveting, hoof trimming, and other interventions.
- (b) Mechanical restraint normally is preferred. Restraining devices such as bales, crushes, and cradles must be designed and sized specifically for each species. This specialized equipment must be regularly maintained and repaired and personnel must be skilled in its operation.
- (c) Use of currently available chemical immobilizing agents is legally restricted to licensed veterinarians and other authorized persons.

- (d) Electro-immobilization (EI) is an effective method of restraint but does not control pain and can be disagreeable, particularly if used repeatedly. Therefore, EI cannot be recommended until scientifically demonstrated to be superior to alternative methods of restraint.

#### 3.4.3 Removal of Antlers

- (a) Antlers of male deer should be removed annually.
- (b) Antler should preferably be removed before development of “hard antler” to help:
  - Protect handlers
  - Other deer and
  - Farm facilities.
- (c) Removal of the “velvet antler” must be under the supervision of a registered veterinary surgeon or by a person accredited under the National Velvet Accreditation Scheme.
- (d) Antlers must not be cut less than 2 cm above the coronet of the pedicle

#### 3.4.4 Identification

Preferred methods for the individual identification of deer includes ear tagging, ear marking and ear tattooing. Hot iron and chemical branding should not be used. Freeze branding may be used but has limited application.

Property trace-back is necessary to satisfy legislative requirements for stock destined for the EU. In the future, it is a likely requirement for other markets.

## 4. Farm Facilities

### 4.1 Housing and Shelter

- (a) Deer should have access to natural or constructed shelter areas that provide protection from weather extremes.
- (b) Building materials including preservatives and paints to which the deer have access should not contain any chemical compounds harmful to the deer or which may contaminate the products destined for human consumption.
- (c) There should be sufficient access to feed and water to avoid competition. Deer within groups should be free to all stand or all lie down comfortably at the same time.
- (d) Handling yards and races must be free of sharp edges and protrusions to prevent injury to animals and personnel.
- (e) Shelter should be available if necessary to separate and protect injured, orphaned or sick animals.
- (f) During the rut, male deer may regularly rub their heads and antler buttons on trees and ring bark them. Appropriately safe tree guards are usually necessary to protect the trees.

### 4.2 Fencing

- (a) Fences must be properly designed and well maintained
- (b) Perimeter fences should prevent escapes and discourage movement of wild deer or predators onto the farm.
- (c) Appropriate fencing materials and construction techniques that minimize the potential for injury should be used. Fencing wire for perimeter fences should be attached on the inside of the perimeter fence posts where possible.
- (d) Generally, electric fencing is only suitable for external fences in combination with other traditional forms of fencing.

### 4.3 Raceways

- (a) Raceways connecting pastures and handling facilities should allow easy herd movement, prevent injury and minimize stress.
- (b) Raceways should be constructed with posts on the outside of the fence wire. Shade netting, solid fencing or some other visual barrier is essential at pressure points and at the entrance to the handling facilities.
- (c) Gates should be designed to prevent animals from getting under them and lifting them off their hinges. Where used, wire should be attached against the inside of the gate rather than the outside. Perimeter gates should be kept free from stock movement and pressure if possible.
- (d) Construction should aim to provide smooth surfaces without protrusions that may cause injury.
- (e) To prevent escapes, double perimeter gates are recommended, particularly at major access points. Gates should be locked to prevent vandalism and theft.

### 4.4 Handling Facilities

- (a) Deer farms must have adequate handling facilities that allow safe and easy handling of deer.
- (b) Walls, ceilings, gateways and doors must be free of sharp edges, projections or gaps that may cause injury to deer.

- (c) Floors of handling facilities should be free draining, provide good traction, and be kept as clean and dry as possible in order to eliminate injuries, discomfort or health risks to the animals.
- (d) Surfaces of handling facilities should enable easy cleaning and disinfection

# 5. Transportation

## 5.1 General

- (a) Persons handling or transporting deer should be properly instructed and knowledgeable about deer behaviour and welfare, and must comply with relevant State and Federal legislation.
- (b) Where possible deer should be segregated into groups of the same species, sex and age during transport. Only fit and healthy animals should be transported.
- (c) Entire stags during the “hard antler” cycle should not be transported with other animals, if they must be transported it is recommended they be penned singly.
- (d) Deer of grossly different sizes, other than dam and progeny, should not be transported together.
- (e) Deer should be transported in properly designed crates or trailers that are well ventilated. Single animal crates should be darkened.
- (f) Floor space should be adequate to allow deer to lie down during transport for journeys in excess of 2 hours. As a guide a preferred floor space required for the small species such as fallow and chital deer is  $0.3\text{m}^2$  per animal, for Rusa deer  $0.4\text{m}^2$  and Red deer  $0.5\text{m}^2$  per animal, or about  $250\text{kg}/\text{m}^2$ .
- (g) Strains of species with larger than average body weight may require more space. Injury during transport can occur if too little or too much space is provided.
- (h) Transport of deer during hot weather should be conducted with caution. In hot climates, deer are preferably transported at night. Adequate ventilation is essential to control the temperature within the transport facility especially during the period immediately following loading and during stops.
- (i) Ventilation is essential and should be adjustable to remove gases and excessive moisture.
- (j) Floors should be non-slip and allow easy cleaning at approved washing sites.
- (k) Inspection of the crate should be carried out within 30 minutes of commencing the journey and thence at about 4-hourly intervals, or more frequently on rough roads or in adverse conditions. Inspection ports located at strategic positions in the crate will assist inspection.
- (l) The driver is responsible for the welfare of deer during transportation.
- (m) Deer should have antlers removed prior to transport. If this is not possible, deer with hard antlers should be transported individually.
- (n) Exhaust gases should be directed away from any ventilation entry point.

## 5.2 Animals Unfit for Transport

Prior to transport, animals should be in good physical condition and health. Deer that are sick, injured, disabled, fatigued or that cannot be moved without causing them avoidable suffering are unfit for transportation.

Except in emergencies, the following deer should not be transported:

- (a) Deer that are unfit (ill)
- (b) Pregnant deer:
  - If they are within 14 days of giving birth



- If they are within 30 days of giving birth and in if the duration of the trip will exceed 6 hours
- (c) Deer with young at foot under 4 weeks of age (young can be transported separately from does for short trips)
- (d) Pre-rut weaned animals within 2 weeks of separation from their dams
- (e) Deer carrying more than 40 mm of velvet, with bleeding or incompletely healed pedicles, or within the first 48 hours after velveting

### **5.3 Loading and Unloading**

- (a) Deer should be loaded and unloaded in a way to prevent injury or suffering. Properly designed and maintained loading facilities should be provided for easy and safe movement of deer.
- (b) Ramps and chutes should be strong, have solid walls and provide secure footing. Good, uniform lighting allows for easy movement of animals. No gap should exist between the ramp, its side and the vehicle. The ramp walls should be high enough to prevent deer from jumping over.
- (c) Ramps must be free from projections and sharp edges.
- (d) Vehicle doors and internal gates should be sufficiently wide to permit deer to pass through readily, without bruising or injury.

## 6. Humane Destruction

Effective and humane methods of euthanasia for deer that administer a quick and painless death include shooting with a firearm, electric stunning or stunning with a captive bolt pistol followed by bleeding.

### 6.1 Firearms

- (a) All firearms must be licensed.
- (b) A suitable firearm for euthanasia is a .22 calibre hollow point (preferably a .222 calibre for large species) rifle used at short range but not placed directly on the head, or a .32 calibre humane killer pistol.
- (c) The direction of the line of fire is shown in figure 1.
- (d) Disadvantages of a firearm are the hazards to human safety and the possibility of not being legal on public property.

### 6.2 Captive Bolt Penetrating Stunner

- (a) A suitable weapon is a captive bolt, penetrating stunner that uses blank cartridges Coded for the amount of power required for the species of animal being destroyed. The stunner is placed firmly against the skull before firing. The concussion stunner (non-penetrating) is not recommended.
- (b) The direction of the line of fire is the same as for a firearm and shown in Figure 1.
- (c) Deer stunned with a captive bolt pistol must be bled out immediately.
- (d) The main advantage of the captive bolt stunner is its safety for operators.

### 6.3 Recommended Positions and Direction of Fire

- (a) Alternate approaches recommendations for euthanasia of deer using a firearm are:
  - (i) From the front using the intersection point of lines taken from the base of each ear to the opposite eye and firing horizontally into the forehead.
  - (ii) When deer have been disturbed it is equally effective to fire through the skull just behind the base of the antlers in the direction of the animals muzzle.
- (b) The recommendation approach for euthanasia of deer using a captive bolt firearm is:
  - (i) From the front using the intersection point of lines taken from the base of each ear to the opposite eye and firing horizontally into the forehead.

### 6.4 Veterinary Supervised Chemical Euthanasia

Where practical, and under the direct supervision of a registered veterinarian, animals may be euthanased using veterinary chemicals.

## 7. Documentation

- (a) The DIAA has adopted a Quality Assurance Program for Deer Farming and Deer Transport aimed at encouraging world's best practice. Providing the necessary accountability to secure Australia's position in World Markets.
- (b) Many World Markets insist on traceability for deer products, which will require an internationally approved Quality Assurance program to record animal identification and allow tracing of animal and product movements..
- (c) All animal movements should be reflected in appropriate documentation as well as setting out responsibilities and demarcation for the parties concerned.
- (d) The Australian Deer industry Quality Assurance programs recommend data recording systems that meet animal identification and tracing requirements.

## 8. Wild and Escaped Deer

- (a) There are many wild populations of deer established in various locations in Australia.
- (b) Deer farmers should not release captive deer and should prevent escape.
- (c) Deer farmers who deliberately release farmed deer to the wild or who do not provide infrastructure that can be reasonably expected to prevent accidental escape, may be liable for prosecution under various State or Federal Legislations.
- (d) Deer farmers should assist local agricultural authorities in recapturing escaped deer or if necessary destroying them.
- (e) Deer may be included in local Impounding Acts such as the NSW Impounding Act of 1993, which allows authorised officers to impound or destroy deer.