Final Report

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Prepared by: Dr Kylie Hewson; Dr Rod Jenner and Dr Ben Wood
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Defining Australian poultry euthanasia practices with a focus on cervical dislocation

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This project is supported by Poultry Hub Australia through funding from AgriFutures Australia as part of its AgriFutures Chicken Meat Program.

Researcher Contact Details
Name: Dr Kylie Hewson
Organisation: Sativus Pty Ltd
Phone: 0422 760 736
Email: kylie@sativus.com.au
Website: www.sativus.com.au

In submitting this report, the researcher has agreed to Poultry Hub Australia publishing this material in an edited form.

Poultry Hub Australia Contact Details
Poultry Hub Australia
CJ Hawkins Homestead, Ring Road
University of New England
Armidale NSW 2350
02 6773 1855
poultryhub@une.edu.au
www.poultryhub.org

Project Summary

Project Title	Defining Australian poultry euthanasia practices with a focus on cervical dislocation
Project No.	216
Date	Start: 22/07/2020 End: 23/07/2021
Project Leader(s)	Dr Kylie Hewson, Dr Rod Jenner
Organisation	Sativus Pty Ltd / Rosetta Veterinary Management
Email	kylie@sativus.com.au / rod_jenner@hotmail.com
Project Aim and background	Application of manual cervical dislocation for euthanasia of different poultry species requires different technique considerations depending on the size of the bird and the ability and fatigue of the operator. Through a comprehensive literature review and industry surveys, this project developed consistent, comprehensive, industry guidance for the use of manual cervical dislocation as a poultry euthanasia technique under Australian circumstances.
Research Outcome	Overwhelmingly, this study found there was an aversion to performing poultry euthanasia, and the welfare needs of the birds are prioritised over potential human welfare considerations. It appears that despite aversion to the use of the technique, manual cervical dislocation is currently the preferred option for both the welfare of the birds and the operators. Manual cervical dislocation is the most immediate and least stressful technique to euthanise the birds, when performed appropriately, and does not introduce significant workplace health and safety risks on farm. One of the key findings of this study is that prescriptive standards could create adverse, unintended consequences because there are many circumstances where cervical dislocation may need to be conducted with operators of widely varying competencies. Despite this, there is opportunity to reduce adverse bird welfare outcomes by better aligning operator aptitude with bird size.
Impacts and Outcomes	This project developed a training framework, which if implemented, should further improve alignment of techniques across the poultry industry. In addition, the guidance document developed in this project considers several aspects of cervical dislocation, including technique modifications for injured birds, and training that can be adopted as the basis for company protocols across the industry.
Publications	None to date. The guidance and document and literature review are to be made public once final sign-off and approval provided.

Project Status

Have the aims of the project been achieved?	Yes
Date final report was due	23/07/2021
Have any publications been released during this project?	No
Are there publications that are planned/in preparation that will be release after the completion of this project?	Potentially; requires approval
Has any IP arisen from this project?	No
Is there any reason to embargo this final report?	Yes

Executive Summary

Through an extensive literature review and in-depth interviews with Australian poultry industry stakeholders, this project developed the Australian "Practical Guideline for the Euthanasia of Poultry using Cervical Dislocation" (guidance document). A broader online industry survey was also conducted to identify the extent of the discrepancy, if any, between industry poultry euthanasia practices as described and recommended by those interviewed, and the realities of what occurs at the farm level. The survey informed components required in the guidance document, and emphasised priorities. The survey was accompanied by a recommended training framework to support implementation of the guidance document and improve the alignment and robustness of practices across the poultry industry.

The information gathered during the project identified that, while there was high alignment in the principles being applied between stakeholders, there were considerable differences between approaches, understanding and preferences for poultry euthanasia and cervical dislocation techniques. Despite this, there was no indication that current industry guidance was inappropriate, and in most instances current approaches were incomplete (e.g. operator welfare was not considered). Overwhelmingly, there was an aversion to performing poultry euthanasia and a general aversion to discussing killing birds in general. The information gathered from industry indicated that the welfare needs of the birds were prioritised over potential human welfare considerations. However, conduct of appropriate cervical dislocation technique, and good bird welfare outcomes, relies heavily on the aptitude and attitude of the operator. Therefore, the guidance document ultimately focuses on the operator and implementation of the technique, as opposed to the technique alone. This will refocus industry on those elements that improve bird welfare outcomes.

The recommended training framework includes consideration that veterinarians responsible for training and verification of an operator should be appropriately aligned and verified in the technique. In addition, different consideration is given to those that regularly conduct cervical dislocation compared to those that occasionally use the technique. It was clear that should prescriptive standards for the conduct of cervical dislocation be imposed, it could create serious adverse unintended consequences due to the various circumstances where cervical dislocation may need to be conducted. Prescriptive standards may prevent a capable operator from effectively conducting the technique and result in adverse animal welfare outcomes and a possible delay in euthanasia. Both situations are to be minimised.

There is no evidence that other poultry euthanasia techniques are more humane than cervical dislocation performed by an experienced operator. This appears to be the practical experience in the industry. In fact, cervical dislocation is likely the preferred option as it is currently the best technique for the welfare of the birds and the operators as it is the fastest and least stressful euthanasia technique when performed appropriately. This technique does not create significant workplace health and safety risks on-farm which accompany alternate on-farm euthanasia techniques (e.g. captive bolt or CO_2 gassing). Therefore, the importance of implementing a robust training and verification framework to ensure cervical dislocation is conducted appropriately in every instance cannot be understated. Implementation of such a framework would allow the Australian poultry industry to be global leaders in on-farm euthanasia.

Table of Contents

Introduction

'Euthanasia' (the term 'killing' is used in the European Union; EU) is any intentional induced process that causes the death of an animal, whereas 'slaughter' is defined as the killing of animals for the purposes of human consumption. Both occur daily in the Australian poultry industry. On-farm euthanasia of poultry is required for numerous reasons including culling injured and sick birds, stock management (e.g. spent layers), emergency killing for disease control and management of natural disasters or other emergencies including those related to animal welfare. The methods used to cull small numbers of animals, or animals of different ages/sizes are diverse and may differ from those applied for large scale depopulation.

In 2009, the EU adopted Council Regulation No. 1099/2009 'on the protection of animals at the time of killing', which was prepared on the basis of two Scientific Opinions adopted by the European Food Safety Authority (EFSA) in 2004 and 2006. There has been extensive work undertaken on this subject in the EU since then (in 2012, 2013, 2014, 2015 and 2017) with the most recent EU Scientific Opinion piece released in 2019 (EFSA, 2019). In this extensive review, 29 hazards were identified regarding on-farm euthanasia of poultry, with 26 hazards related to the operator (EFSA, 2019; Table 5) and 24 of these attributed to fatigue or lack of appropriate skill sets needed to perform tasks. It is not surprising that the EU introduced legislation in 2013 stipulating that entirely manual methods of euthanasia on-farm, including percussive blow and cervical dislocation, be restricted to birds weighing a maximum of 3 kg and can only be performed on 70 birds per person per day to avoid errors due to operator fatigue.

A recent study published in the UK evaluated twelve male stock workers use of mechanical and manual cervical dislocation in meat chickens, laying hens and turkeys to assess the appropriateness of the EU's legislation (Martin, 2018). Each person killed 100 birds at a fixed rate using either neck dislocation or a percussive method using a device called the 'Cash Poultry Killer' (CPK), which is a non-penetrating captive bolt device. In this study, both methods were deemed highly successful, via assessment of the birds using reflex and behavioural measures. There was no evidence of reduced performance with the time it took to reach 100 birds with either method, however there were substantial variations between operator proficiency, technique and the resultant gross pathology outcomes to the birds. The CPK method caused a rapid death, but it was prone to technical difficulties with repeated use. It was concluded that cervical dislocation was more advantageous as it could be performed immediately with no equipment and its associated technical difficulties.

The European Food Safety Authority Opinion (EFSA, 2019) suggests that cervical dislocation should only be used to kill unconscious animals but can be used for large-scale euthanasia and individual applications. Cervical dislocation by crushing (e.g. burdizzos) should not be used under any circumstances as it results in a longer time for birds to die. Some EU countries (e.g. Sweden) have implemented national legislation requiring birds to be properly stunned before cervical dislocation. The RSPCA in Australia has raised welfare concerns around the use of manual cervical dislocation as the loss of consciousness is not immediate and crushing is not considered acceptable. They consider captive bolt devices that are 'appropriately designed, maintained and executed' could be an appropriate alternative

(RSPCA, 2018). A specific recommendation from the RSPCA was to highlight which methods were unacceptable. This includes mass killing by ventilation shut down, improper cervical dislocation methods, crushing the neck, and any methods that include a risk of smothering.

Cervical dislocation is undertaken by a single person using their hands, but can also be conducted with an aid, such as a piece of equipment or device, and is generally acceptable for birds up to 6 kg. Aids that dislocate by stretching or crushing are usually not recommended, and often not approved, as a method of euthanasia. Cervical dislocation by an operator using their hands is the most common method of on-farm poultry euthanasia in Australia. The technique is quick, does not require any equipment and can be performed immediately (ACMF, personal communication). Cervical dislocation should always result in irreversible trauma to the spinal cord through one continuous movement (Woolcott, 2018; AVMA, 2020). However, it has been demonstrated that cervical dislocation techniques may not always be successful and, to be performed correctly, require a high level of skill to minimise bird welfare issues. It is essential that those required to perform cervical dislocation are adequately trained and regular technique verification is maintained to ensure poor techniques do not become embedded in an operation.

In Australia, most state legislation that relates to euthanasia of poultry is based on the recommendations and information in the AusVetPlan Destruction Manual (AHA, 2015). It outlines that any method of euthanasia of poultry is required to:

- not create operator safety issues
- be quick and painless for the birds
- be performed by a skilled operator
- prevent prolonged suffering by the birds and include an assessment of death.

While all major chicken meat companies have processes in place to minimise the conduct of poor cervical dislocation techniques, the chicken meat sector is not the only poultry industry that uses cervical dislocation. Poor practices in one sector can have negative implications for others and presents risks to the birds and the operators. To minimise these risks, this project developed nationally agreed guidance on what constitutes an appropriate cervical dislocation technique in poultry, accompanied by a recommended training framework to improve alignment of techniques and approaches to training operators.

Milestone Description

1. Obtain human ethics approval
2. Develop and conduct survey questionnaire and gather information on the use of cervical dislocation, issues, training needs and opportunities
3. Industry interviews with key poultry industry representatives
4. Consolidate information from the literature review and interviews into a draft guidance document
5. Send draft to industry stakeholders for final comments and finalise the documents
6. Draft Final Report submitted.

Methodology and Outcomes

Obtain human ethics approval

Human ethics approval for the study was sought through the University of Queensland (UQ) Institutional Human Research Ethics Committee. The application approval is included as Appendix A. Approval was granted on the 11th November 2020, which was two months later than planned due to delays within UQ.

Industry interviews with key poultry industry representatives

Methods

Due to the delay in Ethics approval, the industry interviews were also delayed. Twelve 1 – 1.5 hr interviews were conducted with representatives from the duck, meat chicken and egg industries, along with two poultry euthanasia experts. The interviews captured the expert opinion of those responsible for 90% of Australia's meat chicken industry, 95% of Australia's duck industry and 80% of Australia's turkey industry. Given the distribution of the egg industry, it was difficult to capture the same level of involvement. However, relevant industry experts were included and, in most instances, comprised experts that also operate in the chicken meat and turkey industries.

The interview structure and questions are in Appendix B. Each interview was conducted via Zoom and was recorded for thematic analysis of the transcript as described by Braun and Clarke (Braun, 2006). This involved a qualitative analysis of the transcripts for key subjects identified by each respondent, extracting key phrases that related to these subjects, and then capturing frequency of these key phrases among all the interview transcripts. This approach extracted key topics for inclusion and clarification in the guidance document, and also identification of recommendations for the training framework, as well as other knowledge gaps outside the scope of cervical dislocation.

Once the transcript was extracted, the Zoom recording was deleted and all identifiers in the transcripts were removed to avoid risks associated with misuse of information or information being taken out of context. The transcripts were held in a single, secure folder and were not emailed under any circumstances. If an interviewee wished to review their transcript, they were provided access to their transcript via direct access in this folder. Once the project is completed, all transcripts will be destroyed.

Results

It is evident that all poultry industries face the same issues with poultry euthanasia techniques and training. These include:

- general aversion to discuss killing birds
- staff unwillingness to conduct the task
- inadequacies with training materials and training frequency

- differences in approach to training needed for those that are required to conduct the procedure regularly (e.g. farm hands) and those that may only conduct it occasionally (e.g. pick up crews).

These issues are compounded by differences in operators' preferred technique due to particular poultry species and their various weight or age. Despite these differences, there is no indication that current industry guidance is inappropriate and poultry welfare is the overwhelming priority. This suggests that it should be relatively straightforward to align practices across the industries.

Operator proficiency with cervical dislocation techniques is linked with how frequently they conduct the techniques, but more support is required for those new to performing the technique. This would minimise risks to bird and human welfare, and also avoid the emergence of poor practices that could then be passed on to other operators.

All interviews clarified that an outcomes-based approach is required. If prescriptive standards for cervical dislocation are imposed, it could create serious, adverse unintended consequences as there are many circumstances where cervical dislocation may need to be conducted. There is no evidence that other poultry euthanasia techniques are more humane than cervical dislocation when performed by an experienced operator, and this appears to be the practical experience in the industry. In fact, it appears that cervical dislocation may not only be the preferred option, but it also may be the best option for the welfare of the birds and the operators. This is because it is the fastest and least stressful technique to euthanise the birds and does not introduce significant workplace health and safety risks on-farm. All other techniques require additional bird handling (often more than one operator is needed), the utilisation of specialised equipment and at times cannot be completed in-place, which means the birds need to be moved to a new location (either sectioned in the shed with other birds requiring euthanasia or moved outside). These situations create additional stress for the birds and introduces risks to the operator/s.

Submissions and information from interviews indicated that, while the principles being applied align across the poultry industries, there were considerable differences between approaches and preferences for poultry euthanasia and cervical dislocation techniques. Regardless, the overwhelmingly response was that no one wants to perform poultry euthanasia, however they want to achieve the best outcome in regard to the welfare of the birds, often with little or no consideration of the potential impacts on human mental and physical health.

The results from the thematic analysis are in Appendix C.

The key themes extracted from the online survey were:

- Role and expertise
- Public perceptions
- Industry perceptions
- Type of technique vs size of bird
- Who performs the technique

- Signs of death/assessment of successful cervical dislocation
- Signs that a bird requires euthanasia
- Animal welfare
- Hatcheries
- Mass euthanasia
- Captive bolt
- Overseas trends
- Training - frequent vs infrequent operators
- Prescriptive standards
- Preference for technique
- OHS key themes integrated into the industry guidance and training framework.

A recurring theme were the responses in regard to the welfare vs time conundrum during mass euthanasia. Operators want to perform the technique quickly so birds do not have to suffer longer than necessary, but in the process may actually cause welfare issues due to poor practice generated by operator fatigue.

There were regular requests for a 'better' technique, but general acknowledgement that cervical dislocation is currently the 'best' technique based on practical experience when trying alternative techniques. Bird and operator welfare issues were also amplified with the use of existing techniques, which are the same points identified within the reviewed literature.

The thematic analysis has the potential to be published as a separate contribution, however, was outside the scope of the current project. The thematic analysis is primarily to establish the content sections required to produce a robust guidance document.

Develop and conduct survey questionnaire and gather information on the use of cervical dislocation, issues, training needs and opportunities

Methods

An industry questionnaire was developed (Appendix D) and made available as an online form. The purpose of the survey was to identify the extent of the any discrepancy between industry poultry euthanasia practises as described by those in charge of implementing and overseeing poultry euthanasia, and the realities of what occurs at the farm level. A high response rate was not expected considering that most people do not want to think about poultry euthanasia practises. The survey was open for four months (December 2020 – March 2021) with two reminders sent. Even a single identification of a discrepancy between actual on-farm practises and company prescribed practises is unacceptable from an industry perspective and the survey captured where these discrepancies lay, and ultimately, the areas to be emphasised in the guidance document.

Industry participants had the opportunity to ask the project team questions about the survey prior to providing their formal consent to receive the survey link. To respect poultry industry structures, the survey was only sent to those who had been interviewed and it was their decision as to how to appropriately distribute the survey through their respective networks.

To avoid risks associated with information misuse, and given the sensitivity of the information being captured, it was stored on a secure server managed by Sativus Pty Ltd.

Results

Detailed survey results are included in Appendix E. It would be inappropriate to conduct statistical analyses on these data for quantitative results, as the information was collected specifically for qualitative purposes to identify discrepancies between responses. Any discrepancy was considered significant.

The online survey received 68 responses, which was more than expected, however, as expected, the majority (88%) were from the meat chicken industry. Of these, 66% (45) identified as 'farm manager', with other respondents identifying as 'farmhand', 'veterinarian', or 'livestock manager/serviceperson'. This survey highlighted that the need for a consistent and informed approach to training for poultry euthanasia was greater than initially considered. There was a high (>75%) consistency between respondents in relation to:

- Preferred technique (cervical dislocation using hands; 80%)
- Taking bird size into consideration when selecting technique (79%)
- Use of a standard operating procedure (89%)
- Cervical dislocation performed immediately when a bird is identified (96%)
- Consideration of animal welfare when performing cervical dislocation (97%)
- Consideration of the welfare of the operator when performing cervical dislocation (88%)
- Current training is considered adequate (90%).

The majority of participants that responded to the survey were from the meat chicken industry. While this industry's respondents displayed the majority of consistency to the above responses, other industries also acknowledged the same consistency. At times, there were clear discrepancies between responses from participants of different industries.

The fact that discrepancies were identified was cause for concern and provided direction on areas within the guidance document that required emphasis and elements needed for the training framework, such as:

- How to improve consistency in technique for an operator with little experience, or who conducts cervical dislocation infrequently
- The importance of understanding the pathological processes in the poultry, as part of cervical dislocation training
- Clarification in regard to the best option if the initial attempt at cervical dislocation fails
- The importance of considering bird size prior to selection of an appropriate euthanasia technique
- The guidance document should provide clear advice on how to assess the predominant signs of death used by the majority of respondents
- Reinforcing that poultry welfare during euthanasia is entirely dependent on the operator

- Implementing protocols on how to deal with situations where there are operators who are unwilling to perform euthanasia, and how to recognise operator mental and physical fatigue (besides relying on operator self-assessment)
- The importance of regular technique verification
- Concise requirements in regard to frequency of training and technique verification.

The results of the survey and the interviews confirmed that training in cervical dislocation should be prioritised for on-farm poultry euthanasia. Guidance should be developed for use of other approved techniques, such as cervical dislocation with the use of an aid, i.e. blunt force trauma, captive bolt, and the use of a sharp edge for young birds. This would improve consistency in the application of these techniques.

Other on-farm euthanasia techniques

While the main focus of this project was cervical dislocation, the topic of poultry euthanasia techniques on-farm in general was discussed and points of note have been captured below.

Gas euthanasia on-farm

There were substantial concerns raised regarding gas euthanasia on-farm, such as the difficulties in adequately managing the gas levels and operator consistency. Some companies that had used this technique have subsequently transitioned to the use of other techniques. These include transport to a processing plant for end-of-lay hens and situations were mass euthanasia on-farm is required. It may be necessary to clarify and document the issues experienced by those companies that are transitioning away from gas euthanasia on-farm so other companies considering the transition can be fully informed of the practical issues experienced, and potential solutions.

Captive bolt

Given the potential difficulties conducting cervical dislocation on larger birds, captive bolt guns were preferred in the duck and turkey industries, and for larger chicken meat breeders. This tool was suggested as a preferred option for managing public perception of euthanasia in situations where birds in public view required euthanasia (e.g. truck incidents). It removed the confronting imagery of people euthanising birds with their hands which usually generates a more visceral human response than when a tool is being used, even if cervical dislocation is more appropriate.

There is clearly a place for the use of captive bolt guns, although they do introduce on-farm safety issues for operators and several concerns were raised about the potential for inappropriate use, practicality and welfare issues for the birds. The misfire rate reported for the captive bolt guns is also cause for concern (industry responses; Raj, 2001; Gibson 2019). The appropriate technique requires two operators meaning additional bird handling, and it is often best conducted in ‘batches’, meaning birds are moved to a separate location and required to wait to be euthanised along with other birds. This delays time in euthanasia and generates potential additional stress to the birds, depending on where they are moved to, and how they are grouped or penned prior to euthanasia. Neither of these situations are ideal,

however there are potential benefits in the proper use of captive bolt guns. Therefore, guidance is required to support implementation of this tool's use across the poultry industry.

Consolidate information from the literature review, survey and interviews into a guidance document

Methods

The draft literature review is included as Appendix F. This literature review was prepared by University of Queensland veterinary science student Daniel McBain as part of his Veterinary Science course requirements and was subsequently reviewed by the members of the project team. The review looks in-depth at the brain-stem responses to various euthanasia methods, and concluded that manual cervical dislocation has been found to be a humane, effective method for the euthanasia of poultry. Given that plier-like devices produced consistently poorer behavioural and anatomical results to manual cervical dislocation, it is the author's recommendation that these devices should no longer be indicated as a suitable method for euthanasia in Australia (McBain review; Appendix F).
The review did not specifically look at the impact on human welfare. Operator competency and the onset of both mental and physical fatigue are contributing factors to the effectiveness of cervical dislocation. Therefore, this is a key area to be included in the industry guidance document.

Given the sensitivity of the topic, the review still requires thorough review and editing, and potential sign-off from the Australian Chicken Meat Federation, Australian Eggs and Australian Duck Meat Federation prior to publication. Despite this, the review is comprehensive and was essential for informing the draft of the guidance document, the questions for the survey and interviews, and should be published in the Australian Veterinary Journal along with accompanying key outcomes from this current project.

Once the draft of the guide was completed, a comparison was conducted between the content and descriptions provided in other documents, to determine potential areas lacking and areas that might generate criticisms. This comparison assessed the information included in the Poultry Hub Australia guidelines with existing guidelines in Australia, Europe and Canada.

The following documents were compared to the Practical Guideline for Euthanasia of Poultry using Manual Cervical Dislocation (PHA 216 Project):

1. AUSVETPLAN Resource Document – Methods for the destruction of poultry, pet/zoo birds and aviary species (AHA, 2020)
2. RSPCA Approved Farming Scheme Standards (meat chickens and layers) (not publicly available)
3. Australian Animal Welfare Standards and Guidelines for Poultry – Draft S&Gs (March 2021; not publicly available)
4. Practical Guidelines for on-farm euthanasia of poultry (Poultry Industry Council Canada, 2016)
5. Killing for purposes other than slaughter: poultry (EFSA, 2019).

Results

The guidance document is included as Appendix G and was subjected to numerous reviews and feedback from those who were consulted as part of the interviews. Most stakeholders were comfortable with the preliminary versions, but some sections required refinement and these were the subject of repeated reviews (e.g. terminology, refinement of the description of the technique). One particular area of contention was how to hold birds to conduct cervical dislocation if their wings or legs were injured. The RSPCA requires birds be held by the wings if their legs are injured, but many stakeholders disagreed that this approach was appropriate in practice, particularly as operators would rarely have the opportunity to practice the modified hold. The guidance document has included descriptions of both holds with no indication of preference.

Preparation of the document highlighted some areas where industry would benefit from additional guidance in areas outside the scope of cervical dislocation. Cervical dislocation is recommended for poultry over 7 days of age, up to 4 kg, without need for additional considerations. There is a need for clear guidance and training support for euthanising birds under 7 days of age, and for cervical dislocation involving the use of an aid. These two areas are particularly difficult to address and will require careful consideration of scope, and extensive review and consultation. They could be produced as additional sections within the guidance document produced for cervical dislocation as much of the background consideration and the training framework will be the same, but the techniques themselves require clarification.

There is also a need to provide industry stakeholders with some suggestions, or a template of procedures that should be in place within each farming operation to manage on-farm poultry euthanasia. It should include elements such as managing situations where operators refuse to conduct cervical dislocation, where mass euthanasia is required (using cervical dislocation), training and verification, and managing operator fatigue.

Comparison of the guidance document with other guides and information from existing guidelines in Australia, Europe and Canada, concluded that the guidelines produced as part of this project are the most comprehensive and require no additional refinement (Appendix H). The guidance document developed for this project defines roles and responsibilities, describes the technique in detail including modifications for injured poultry, defines limits for conduct to avoid poor animal and operator outcomes, and highlights operator health and safety considerations. These may be elements of the other documents, but none capture all the topics.

Given the AusVetPlan document (destruction manual) is used by government and industry in emergency situations, it is recommended that the detail in this guidance document be provided to Animal Health Australia to use when updating the destruction manuals (both general and poultry specific manuals).

Cervical dislocation training framework

No formal training framework for cervical dislocation was identified anywhere internationally. Therefore, if Australia were to implement a more formal framework for training and verification, it would reinforce how seriously the Australian poultry industry takes the issue of bird welfare. The recommended training framework for aligning cervical dislocation technique and operator aptitude across the poultry industries is provided in Appendix I. Implementation of the training framework will guide the development of relevant training materials, but imagery/videos should be used as opposed to heavy text. Consideration should be given to translation of the text into other languages for workers in the poultry industry.

In all cases, a veterinarian was reported as the person responsible for the preliminary training of operators, however there is a need for the techniques of these veterinarians to be aligned and verified as there were slight variations in their respective approaches. Operators need to understand the poultry anatomical and physiological changes expected with cervical dislocation, and poultry veterinarians are best equipped to provide guidance, direction and possible modifications in the technique. It is recommended that the Australasian Veterinary Poultry Association (AVPA) be involved in the development and roll-out of the training framework, as poultry veterinarians are responsible for on-farm euthanasia techniques used throughout the industry. Ideally, the AVPA would be supported in maintaining the register of those who had been trained, with it linked to continuing professional development requirements. The AVPA should be approached for endorsement of the guidance document.

There should be no more than three levels of cervical dislocation training, and all operators should be required to undertake technique verification on a regular basis with it suitably recorded:

> Level 1 - A registered poultry veterinarian or other appropriately qualified person, with the expertise to train operators
>
> Level 2 - A facility Animal Welfare Supervisor and technical support staff (including servicepersons and processing staff) with the knowledge to train operators
>
> Level 3 - Operators whose role involves conduct of cervical dislocation.

Those not required to conduct cervical dislocation, or provide training in the technique as part of their role, should not be trained in the technique. This avoids unnecessary potential risks to poultry used during training and the risks associated with application of the technique by those not responsible to perform cervical dislocation.

Any training will require practical guidance preferably using live birds. A training framework using this approach will need to adhere to the Australian Code for the care and use of animals for scientific purposes. Training with the use of animals is captured under the Code, which states “AEC approval is not required for the training and application of agricultural extension work practices, or the training of students in veterinary science, veterinary nursing or animal

technology to achieve competency-based outcomes in routine procedures if all of the following apply:

i. the animals are at their home property or a premises licensed by a state or territory Veterinary Surgeons Board
ii. the procedures would normally occur as part of routine management or veterinary clinical management of the animal
iii. the animals are not subjected to anything additional to routine management or veterinary clinical management of the animal
iv. the teacher is competent to carry out the procedure."

The interpretation is that a training framework for cervical dislocation would have to:

- use birds that were otherwise going to be euthanised
- training conducted on the farm where the birds are located
- no additional handling (before they're dead) or stress applied to the birds beyond what would normally be expected in the conduct of routine cervical dislocation
- the trainer has had their competency assessed in some formal manner.

If the training conducted was outside this framework, then formal animal ethics approval would be required.

The Australian Industry and Skills Committee (AISC) is responsible for maintaining vocational education and training standards across all industries. Euthanasia of livestock falls within the Unit of Competency "AHCLSK307 – Euthanase Livestock". This unit is currently included in the Certificate III- Poultry Production and provides broad guidelines, elements and performance criteria which must be attained in order to receive training certification. However, this unit is written for all livestock species and has no specific operational descriptions for the euthanasia of poultry. Development of training material for cervical dislocation of poultry should form a companion unit to support this unit of competency in order to become a nationally recognised, verified and standardised training package. It was a frequent message from interviewees that consistent guidance and training materials should be key outcomes for this project. It is recommended that the AISC training materials are updated to reflect the content in this guidance document.

Discussion

Overall, the project delivered beyond the original aims, as the guidance document and resultant recommended training framework have been developed to be relevant to all poultry, not just meat chickens. As the project progressed, it became clear that stakeholders from different industries had similar challenges and needs, which raised an opportunity to expand the scope of the document, and approval was obtained from industry representatives to include all poultry. Both bird size and type that dictates whether and how cervical dislocation is used, and an operator's aptitude and confidence was important for minimising potential poor animal and human welfare outcomes. The resultant guidance document is comprehensive and was reviewed extensively by poultry industry and poultry euthanasia experts and stakeholders to ensure the guidance and recommendations were refined and also

minimised the risk of unintended negative consequences. Implementation of the recommended training framework will clarify the importance of cervical dislocation for on-farm euthanasia of poultry in Australia, and ensure Australia are world leaders in on-farm poultry welfare internationally.

Implications

This project produced the first consolidated, comprehensive guidance for on-farm euthanasia of poultry using cervical dislocation in Australia. This technique is essential for the poultry industries to manage the welfare of birds in their care as no superior alternative currently exists. Variation in operator aptitude puts bird welfare, operator welfare, and retention of the technique at risk. Expansion of the document to include the description of techniques for cervical dislocation using an aid for birds under 7 days and birds over 4kg will provide valuable supplements to the guidance document. Implementation of the recommended training framework will ensure adoption of the technique across industry. The guidance document should be made publicly available as soon as possible and its existence reported to industry, so they can initiate improvements prior to the training framework being introduced.

Recommendations

1. The results from the thematic analysis should be considered for publication in consultation with key stakeholders.
2. Guidance should be developed for use of other approved techniques such as cervical dislocation with the use of an aid, captive bolt, and the use of a sharp edge for young birds to improve consistency in the application of these techniques on-farm.
3. Appropriate methods for on-farm euthanasia of poultry over 4kg and under 7 days of age (or equivalent size) where an operator is not confident or trained in the use of cervical dislocation including cervical dislocation with the use of an aid, should be clarified. This could be included as additional sections in the guidance document.
4. Development of relevant training materials using imagery/videos taking into consideration translation of the text into other languages.
5. Develop a template for on-farm euthanasia procedures, including roles and responsibilities, which should be in place within each farming operation.
6. Document the issues experienced, and solutions developed, by those companies that have transitioned from on-farm gas euthanasia so other companies considering the transition can be fully informed.
7. This guidance document should be provided to Animal Health Australia to guide their scheduled review of the relevant AusVetPlan destruction manuals.
8. AISC training materials should be updated to reflect the content within the guidance document.
9. The AVPA should be approached to endorse the guidance document and ideally be involved in the development and roll-out of the training framework. They could be the

recommended organisation responsible for maintaining the register of those trained and linked to continuing professional development requirements.

Acknowledgments

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Media publications

No media publications have been produced during the project, and none are planned. Due to the sensitive nature of the project, any media publications would need to be carefully considered and approved by representatives from each of the Australian poultry industries.

Intellectual Property Arising

No commercialisable IP has arisen during the project. It is recommended that the report and all appendices, excluding Appendix G (the guidance document) be embargoed, and not approved for public release unless approved by Poultry Hub in consultation with the Australian Chicken Meat Federation and Egg Farmers Australia given the sensitive nature of the project and the candid nature of the input by industry stakeholders. Some of the content could create serious reputation damage to the Australian industry, and potentially jeopardise the use of cervical dislocation. This would be contrary to the intentions of the project which has been initiated to protect the use of the technique in Australian poultry industries.

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Appendices

Appendix A Human Ethics Approval
Appendix B Stakeholder Interview
Appendix C Thematic Analysis Results
Appendix D Online Survey Questions
Appendix E Online Survey Results
Appendix F Literature Review Draft
Appendix G Cervical Dislocation Guidance Document
Appendix H Comparison of Cervical Dislocation Guidance
Appendix I Recommended Training Framework