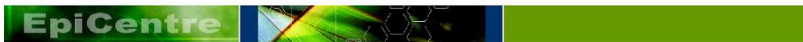


Welfare assessment of pigs in New Zealand: taking an epidemiological approach

Daan Vink, Eric Neumann, Ian Barugh

August 12, 2009



- 1 Welfare and epidemiology
- 2 Methods
- 3 The assessment protocol
- 4 Discussion

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Definitions of animal welfare

Fundamentally, the term 'animal welfare' encompasses philosophical and ethical concerns about the quality of life experienced by animals kept in production agriculture.

- Definition and interpretation of welfare are subjective activities.
- The difficulty of objective measurement of the criteria which collectively determine welfare has led to an array of definitions, approaches and assessment indicators.

Developments in welfare science

- 1 From *facilities-based approaches* to *animal-based approaches*: objectively-quantified environmental parameters to subjectively-quantified behavioural parameters.
- 2 From *measuring* to *monitoring*: controlled laboratory experiments to farm-level assessment.
- 3 Practical implementation of science-based principles:
 - for regulation: assessment protocols in ‘real life’ situations;
 - for quality assurance: programmes providing welfare assurance that are valued and trusted both by producers and by the general public.

Synergies between welfare and epidemiology

- Striking parallels:
 - both study and identify ‘dis-ease’, which is highly multifactorial in nature;
 - both rely on observation to acquire information;
 - both tend to work from animal level to farm (or higher) level.
 - both require analytic techniques for systematically-collected data.
- Potential for mutual benefit!

How can welfare science inform epidemiology?

- Welfare science has developed methods for dealing with complex and interrelated observations, where the outcome cannot be quantitatively verified.
- Aggregation and integration of this information into a single, dichotomous or categorical outcome.

How can epidemiology inform welfare science?

- Structured methods for capturing data are well-developed, e.g. questionnaire design.
- Epidemiology has developed quantitative approaches for formal analysis of data; these could be applied or modified for the purposes of welfare assessment.

Pig production and welfare in New Zealand

- The legislation in the *Animal Welfare (Pigs) Code of Welfare* (2005) specifies 20 minimum standards for the care of pigs. These are primarily facility-based measures.
- Management and husbandry are broadly comparable with other pig-producing countries, as is the regulatory oversight.
- There is currently no system of routine welfare checks on pig farms in New Zealand; welfare awareness is primarily maintained through farmer participation in husbandry training programmes.
- Recently, there has been an uproar in the national media over the poor perceived level of pig welfare.





The screenshot shows a Mozilla Firefox browser window displaying a news article. The address bar shows the URL: <http://tvnz.co.nz/politics-news/minister-wants-pig-farm-investigated-2742709>. The article title is "Minister wants pig farm investigated". It was published at 10:59AM on Monday, May 18, 2009, and the source is ONE News. The article text states: "Animal welfare investigators will inspect a pig farm at the centre of an animal welfare probe as soon as campaigners reveal where the property is, Agriculture Minister David Carter says." A related link is provided: "TVNZ's Sunday programme aired a story in which Comedian Mike King along with animal activists, broke into a crate pig farm." A photo of a pig is visible on the right side of the article. The browser's navigation bar includes links for NZ News, World, Business, Politics, Weather, Entertainment, Health, Tech, and Travel. The article interface includes a "READ" button and a "WATCH (4)" button. A sidebar on the left contains a "The story so far..." section with a link to "Mike King tackles pig welfare" and a "Related" section with a link to "Pig welfare information". A "Politics News" section is also visible at the bottom left of the article content.

Minister wants pig farm featured in Sunday story invest Investigation at named pig farm | Stuff.co.nz - Mozilla Firefox

http://tvnz.co.nz/polit... http://www.stuff.co.nz/the-press/news/2422790/Investigation-at-named-pig-farm

Minister wants pig farm featured in ... Investigation at named pig farm | S...

NZ News | World | Business | Politics

[Back to previous page](#) | [Go to the politics section](#)

Minister wants pig farm invest

Published: 10:59AM Monday May 18, 2009
Source: ONE News

READ

The story so far...

- Mike King tackles pig welfare > [watch](#)

Related

- Pig welfare information

Politics News >> 06:08

Investigation at named pig farm

Last updated 14:00 19/05/2009 3 comments Text Size Print Share



Animal welfare investigators are inspecting a pig farm featured in a current affairs programme at the weekend, Agriculture Minister David Carter has confirmed.

TVNZ's Sunday programme aired footage by animal welfare organisation Open Rescue, who were accompanied by comedian Mike King during a break-in at the Levin pig farm.

King, a long-standing front man for a campaign advertising pork, said he was deeply ashamed of his role in promoting that type of farming.

The pigs were unable to move and obviously in distress, chewing at the cage bars and frothing, he said.

Mr Carter said the ministry had identified the farm through various

Minister wants pig farm featured in Sunday story invest Investigation at named pig farm | Stuff.co.nz - Mozilla Firefox

http://tvnz.co.nz/polit... http://www.stuff.co.nz/the-press/news/2422790/Investigation-at-named-pig-farm

Minister wants pig farm featured in ... Investigation at named pig farm | S...

MAF inspection found nothing wrong with pig farm: Owner - National - NZ Herald News - Mozilla Firefox

http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=...

MAF inspection found nothing wrong ...

The New Zealand Herald
nzherald.co.nz
TUESDAY AUGUST 11, 2009
10:38PM NZT

News Business Sport Technology Entertainment Life & Style Travel
National World Weather Politics Crime Health Environment Science

Investigation at named pig farm

3 comments Text Size Print Share

MAF inspection found nothing wrong with pig farm: Owner

7:09PM Tuesday May 19, 2009

The owner of a pig farm featured in a television current affairs programme, says animal welfare investigators did not find anything wrong when they inspected his farm today.

TVNZ's Sunday programme aired footage by animal welfare organisation Open Rescue, who were accompanied by comedian Mike King during a break-in at the Levin pig farm.



Photo / Getty Images

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The New Zealand Herald
nzherald.co.nz TUESDAY AUGUST 11, 2009 10:38PM NZT

News Business Sport Technology Entertainment Life & Style Travel
National World Weather Politics Crime Health Environment Science

National Share Print Email RSS

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Photo / Getty Images

Robyn Kippenberger: Real pig of a welfare code needs substantial changes

4:00AM Monday Jul 13, 2009

It isn't often that a television programme creates quite as much furore as the recent Sunday pig farming expose. The scenes of highly stressed pigs, tightly confined in sow stalls and farrowing crates, clearly struck a nerve among New Zealanders, generating an unprecedented level of concern over how our pork is produced.

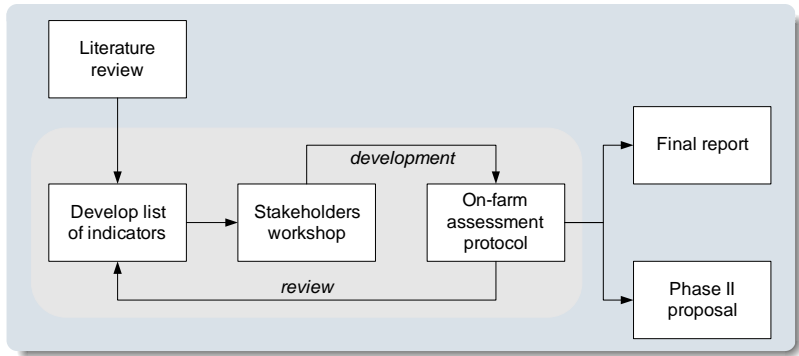


A visit to a piggery by the Sunday programme exposed the conditions many pigs are forced to live in. Photo / NZ Open Rescue

Mr Carter said the ministry had identified the farm through various

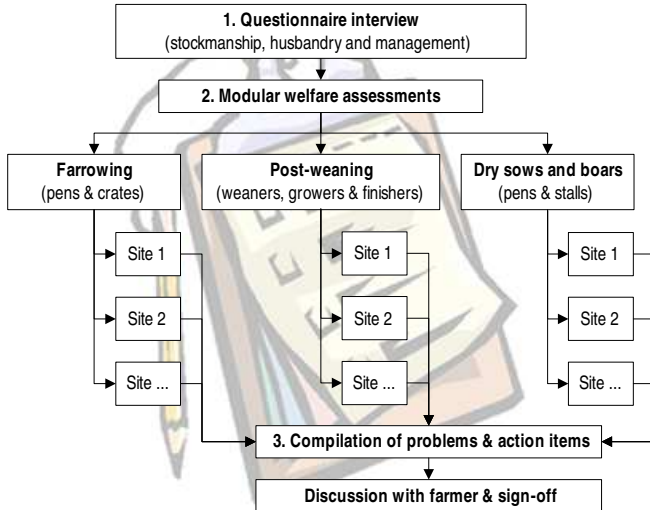
- Objectives of this work:
 - to identify useful animal-based indicators useful for assessing the welfare status of pigs, which could be used for the review of the Code;
 - to develop an on-farm tool for interpreting these indicators across production settings while providing a link to the 20 Minimum Standards.
- Requirements were that the tool:
 - utilized valid measures of pig health and welfare;
 - accurately reflected the current welfare status of pigs on a farm;
 - was reliable and repeatable;
 - had an intuitive design that could be used by welfare inspectors and production system consultants.

- 1 Welfare and epidemiology
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- Three modules:
 - farrowing;
 - weaners, growers and finishers;
 - dry sows and boars.
- Per module, three sections:
 - hunger and thirst;
 - behaviour and interaction with the environment;
 - health.
- Per section, a generic set of animal-based indicators:
 - vocalisation / noise;
 - physical appearance;
 - behaviour;
 - mobility;
 - faeces.



Evaluation of stockmanship, husbandry and management related to welfare provision		Date	
		____ / ____ / 20____	
1. Farm details			
Farm name / address: _____ _____ _____			
Farm telephone / mobile: _____			
Please provide details of personnel (tick the box of those spoken with):			
	Name	Level of training / experience	Function / role
<input type="checkbox"/>	Owner	_____	_____
<input type="checkbox"/>	Manager (if different)	_____	_____
<input type="checkbox"/>	Stockperson(s)	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Please give the approximate numbers of animals presently on the farm:			
	Number		
Dry sows	_____	Total	_____
Lactating sows	_____		
Piglets	_____		
Weaners	_____		
Growers	_____		
Finishers	_____		

2. Stockmanship																		
Briefly describe how you handle and move the animals in your care.																		
Piglets: _____																		
Other pigs: _____																		
Minimum Standard No.14 – Restraint and Handling																		
Pigs, including piglets, must not be picked up or suspended by one or both of their front legs. <input type="checkbox"/> OK <input type="checkbox"/> not OK																		
Minimum Standard No.15 – Movement																		
(a) Pigs must not be prodded in sensitive areas. <input type="checkbox"/> OK <input type="checkbox"/> not OK (b) Only the minimal force required must be used when moving pigs.																		
When do you inspect the animals in your care? _____																		
Minimum Standard No.18 – Inspections																		
The owner or person in charge must check pigs at least once each day for signs of ill-health or injury and take action as appropriate. <input type="checkbox"/> OK <input type="checkbox"/> not OK																		
[INSPECTOR ONLY] Are you satisfied that the following Minimum Standard has been met?																		
Minimum Standard No. 20 – Stockmanship																		
Pigs must be cared for by a sufficient number of personnel who possess the appropriate ability, knowledge and professional competence to maintain the health and welfare of the animals in accordance with the minimum standards listed in the Code. <input type="checkbox"/> OK <input type="checkbox"/> not OK																		
3. Husbandry and management																		
Which of the following procedures are carried out on the farm, by whom, and at which timepoint?																		
<table border="1"> <thead> <tr> <th>Procedure</th> <th>By whom?</th> <th>Which timepoint?</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> Castration</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Tail docking</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Teeth clipping</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Back-fat measuring</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Euthanasia</td> <td></td> <td></td> </tr> </tbody> </table>	Procedure	By whom?	Which timepoint?	<input type="checkbox"/> Castration			<input type="checkbox"/> Tail docking			<input type="checkbox"/> Teeth clipping			<input type="checkbox"/> Back-fat measuring			<input type="checkbox"/> Euthanasia		
Procedure	By whom?	Which timepoint?																
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<input type="checkbox"/> Teeth clipping																		
<input type="checkbox"/> Back-fat measuring																		
<input type="checkbox"/> Euthanasia																		

Minimum Standard No.13 – Elective husbandry procedures

- (a) Elective invasive procedures must be carried out by competent operators.
- (b) Surgical castration or tail docking of pigs over 7 days of age must only be carried out by a veterinarian.
- (c) If tail docking is performed, it must be done before 8 days of age and must be carried out using clippers, a searing iron, knife or other instrument that severs the tail immediately.
- (d) If performed, teeth clipping of pigs must be carried out before 3 days of age.
- (e) Non-invasive equipment must be used to measure back-fat on live animals.

OK

not OK

What are the criteria used to decide whether to euthanise an animal? How is this performed?

Briefly describe the way in which weaning is carried out.

Minimum Standard No.16 – Weaning

Weaning must be managed in a way that avoids undue stress on the piglets and therefore minimises negative impacts on their health and welfare.

OK

not OK

How and by whom are pigs selected prior to transport?

Minimum Standard No.19 – Pre-Transport Selection

Pigs must be inspected prior to transport to ensure all are fit to be transported.

OK

not OK

4. Sign-off

Inspector comments:

Inspector name:

Signature:

Outline
 Context
 Methods
Assessment protocol
 Discussion

Farrowing	Farm ID: _____ DATE:
Section ID: _____ Production system:	<input type="checkbox"/> Farrowing crates <input type="checkbox"/> Pans <input type="checkbox"/> Outdoors

1. Hunger and thirst

Animal-based indicators	Animal Welfare (Pigs) Code of Welfare 2005
<p>a. Sows</p> <ul style="list-style-type: none"> - Vocalisation / noise 🟢🟡🔴 - Physical appearance 🟢🟡🔴 - Behaviour 🟢🟡🔴 - Mobility 🟢🟡🔴 - Faeces 🟢🟡🔴 	<p>Minimum Standard No.1 - Feed</p> <p>(a) Feeding frequency (b) Feed delivery (c) Feed quantity to: (i) maintain good health (ii) meet physiological requirements (iii) avoid metabolic & nutritional disorders (d) Daily check of automatic feeding systems (e) / (f) Maintenance of body condition score at or above 2.5 / remedial action if lower</p> <p style="text-align: right;"> <input type="checkbox"/> OK <input type="checkbox"/> Not OK </p>
<p>b. Piglets</p> <ul style="list-style-type: none"> - Vocalisation / noise 🟢🟡🔴 - Physical appearance 🟢🟡🔴 - Behaviour 🟢🟡🔴 - Mobility 🟢🟡🔴 - Faeces 🟢🟡🔴 	<p>Minimum Standard No.2 - New-Born Piglets</p> <p>(a) Supply of colostrum or appropriate substitute to all piglets within 24 hours of birth (b) Remedial action with respect to piglets if a lactating sow dies or her milk supply fails</p> <p style="text-align: right;"> <input type="checkbox"/> OK <input type="checkbox"/> Not OK </p>

Comments: _____

Inspector signature / initial: _____

Farrowing	Farm ID: _____ Section ID: _____ (page 2)
-----------	---

2. Interaction with the physical environment

Animal-based indicators	Animal Welfare (Pigs) Code of Welfare 2005
<ul style="list-style-type: none"> - Vocalisation / noise 🟢🟡🔴 - Physical appearance 🟢🟡🔴 - Behaviour 🟢🟡🔴 - Mobility 🟢🟡🔴 - Faeces 🟢🟡🔴 	<p>Minimum Standard No.4 - Buildings and Maintenance</p> <p>(a) Light of at least 20 lux in all buildings for at least nine hours daily. (b) All pig sheds must have at least 20 lux for inspection of animals. (c) Sharp projections and edges including damaged flooring likely to cause injury to pigs must be removed or smoothed. (d) Pen fittings must be kept in good working order. (e) Any electrical fittings and attachments to main voltage must be out of the reach of pigs, or protected from interference by pigs. (f) All mechanical equipment used in pig production must be maintained in good working order. (g) In case of power failure or mechanical breakdown, provision must be made for other means of heating, lighting and ventilation, and for the heating and rearing of stock. (h) In case of power failure or mechanical breakdown, an alarm with a back-up battery system must be installed to warn of any ventilation system breakdown. (i) For draught-free systems, provision must be made to minimise the impact of flooding through water pipes bursting. (j) All pig sheds must contain suitable fire fighting equipment and there is documented the emergency plan. This also applies to heated rearing areas where they are adjacent to pig housing</p> <p style="text-align: right;"> <input type="checkbox"/> OK <input type="checkbox"/> Not OK </p>
	<p>Minimum Standard No.5 - Temperature</p> <p>(a) Provision of an appropriate ambient temperature range to maintain normal body temperature of new-born piglets. (b) Heating devices must be securely fixed and protected from interference by the sow and piglets. (c) An outlet, or other measure, that will ensure pigs do not become overheated or cold stressed must be maintained during extreme of weather.</p> <p style="text-align: right;"> <input type="checkbox"/> OK <input type="checkbox"/> Not OK </p>
	<p>Minimum Standard No.7 - Air Quality</p> <p>(a) Ventilation must be sufficient to prevent the build-up of harmful concentrations of gases such as ammonia and CO₂. (b) If ammonia levels of 20ppm or more are detected within the pig house, immediate and appropriate action must be taken to ensure a return to reduce ammonia levels below 20ppm.</p> <p style="text-align: right;"> <input type="checkbox"/> OK <input type="checkbox"/> Not OK </p>

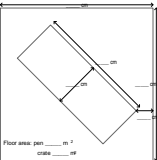
Comments: _____

Inspector signature / initial: _____

Outline
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Discussion

Farrowing Farm ID: _____ Section ID: _____ (page 3)

2. Interaction with the physical environment (cont.)

Animal-based indicators	Animal Welfare (Pigs) Code of Welfare 2005																																				
<p>Recommended pen dimensions:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Measurement (cm)</th> <th>At 100 kg</th> <th>At 200 kg</th> </tr> </thead> <tbody> <tr> <td>Length</td> <td>150</td> <td>180</td> </tr> <tr> <td> - Lying area</td> <td>30</td> <td>30</td> </tr> <tr> <td> - Rump rail</td> <td>30</td> <td>30</td> </tr> <tr> <td> - Trough</td> <td>30</td> <td>30</td> </tr> <tr> <td>Total Length</td> <td>210</td> <td>230</td> </tr> <tr> <td>Width</td> <td>90</td> <td>90</td> </tr> <tr> <td> - Floor level to 20 cm</td> <td>90</td> <td>90</td> </tr> <tr> <td> - 20 cm to 100 cm above floor level</td> <td>90</td> <td>90</td> </tr> <tr> <td>Bottom rail</td> <td>160</td> <td>200</td> </tr> <tr> <td> - height from floor</td> <td>30</td> <td>30</td> </tr> <tr> <td> - distance from draught barrier</td> <td>30</td> <td>30</td> </tr> </tbody> </table> <p>Measured pen dimensions:</p>  <p>Floor area: pen _____ m² crate _____ m²</p> <p>Comments: _____ _____ _____</p> <p>Inspector signature / initial: _____</p>	Measurement (cm)	At 100 kg	At 200 kg	Length	150	180	- Lying area	30	30	- Rump rail	30	30	- Trough	30	30	Total Length	210	230	Width	90	90	- Floor level to 20 cm	90	90	- 20 cm to 100 cm above floor level	90	90	Bottom rail	160	200	- height from floor	30	30	- distance from draught barrier	30	30	<p>Minimum Standard No.9 - Farrowing</p> <p>(a) Whatever type of farrowing system is used, it must be of suitable design and size to allow the sows to lie down at full length and without leg restriction. Sows must also be able to rise and stand comfortably.</p> <p>(b) If sows are to be confined in farrowing crates, they must be confined for no more than 6 weeks in any one reproductive cycle.</p> <p>(c) There must be a space of 300mm width on the rearward side of the farrowing crate to provide an escape area for the piglets.</p> <p style="text-align: right;"> <input type="checkbox"/> OK <input type="checkbox"/> Not OK <input type="checkbox"/> Yes <input type="checkbox"/> No </p> <p>If crates are used, plans to reduce duration of confinement / phase out?</p> <p>Minimum Standard No.5 - Space</p> <p>(a) Each pig housed indoors must be provided with the minimum space allowances as specified by the Code.</p> <p>(b) A dunging area, as part of a total slab, and/or an open drain, if provided, must be included from the total space requirement.</p> <p>(c) In hot conditions (over 22 °C) slabs must be laid to reduce overheating of pigs.</p> <p style="text-align: right;"> <input type="checkbox"/> OK <input type="checkbox"/> Not OK </p> <p>Minimum Standard No.8 - Outdoors environment</p> <p>(a) A warm, dry, adequately ventilated area for sleeping and resting must be provided for all classes of pig.</p> <p>(b) Pigeons must be provided with a warm, dry area which is adequately ventilated and protected from harmful draughts.</p> <p>(c) If there is no artificial heating, bedding materials must be available for pigs.</p> <p>(d) To prevent heat stroke or sunburn, shelter must be provided from the sun, or a shelter must be provided, or both.</p> <p>(e) Effective fencing must be provided to prevent stock from leaving drinking water and gaining access to areas with toxic plants or other hazards.</p> <p>(f) Herding facilities must be available for deal with animals undergoing routine procedures or for animals that are sick and requiring treatment.</p> <p>(g) Accommodation for lactating sows must be of suitable design and sufficient area to allow the sows to lie down at full length and without leg restriction. The sows must also be able to lie down, rise and stand comfortably without undue risk of injury to her litter.</p> <p style="text-align: right;"> <input type="checkbox"/> OK <input type="checkbox"/> Not OK </p>
Measurement (cm)	At 100 kg	At 200 kg																																			
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- Lying area	30	30																																			
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- Trough	30	30																																			
Total Length	210	230																																			
Width	90	90																																			
- Floor level to 20 cm	90	90																																			
- 20 cm to 100 cm above floor level	90	90																																			
Bottom rail	160	200																																			
- height from floor	30	30																																			
- distance from draught barrier	30	30																																			

Farrowing Farm ID: _____ Section ID: _____ (page 4)

3. Health, injury and disease

Animal-based indicators	Animal Welfare (Pigs) Code of Welfare 2005													
<ul style="list-style-type: none"> - Vocalisation / noise - Physical appearance - Behaviour - Mobility - Faeces 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px; background-color: green;"></td> <td style="width: 20px; height: 20px; background-color: orange;"></td> <td style="width: 20px; height: 20px; background-color: red;"></td> </tr> <tr> <td style="width: 20px; height: 20px; background-color: green;"></td> <td style="width: 20px; height: 20px; background-color: orange;"></td> <td style="width: 20px; height: 20px; background-color: red;"></td> </tr> <tr> <td style="width: 20px; height: 20px; background-color: green;"></td> <td style="width: 20px; height: 20px; background-color: orange;"></td> <td style="width: 20px; height: 20px; background-color: red;"></td> </tr> <tr> <td style="width: 20px; height: 20px; background-color: green;"></td> <td style="width: 20px; height: 20px; background-color: orange;"></td> <td style="width: 20px; height: 20px; background-color: red;"></td> </tr> </table>													<p>Minimum Standard No.17 - Health</p> <p>(a) Those responsible for the care of pigs must be competent at recognizing the signs of good health, ill-health, or injury and must consult a veterinarian as appropriate.</p> <p>(b) Medication must only be used in accordance with registration conditions, manufacturer's instructions or professional advice.</p> <p>(c) Pigs must receive sufficient iron to avoid anaemia.</p> <p>(d) Concomitant bedding, faeces and urine must not be permitted to accumulate to the extent that they pose a threat to the health and welfare of pigs.</p> <p style="text-align: right;"> <input type="checkbox"/> OK <input type="checkbox"/> Not OK </p>
<p>Comments: _____ _____ _____</p> <p>Inspector signature / initial: _____</p>														
<p>4. Sign-off</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Name of Inspector</th> <th style="width: 50%;">Signature</th> </tr> </thead> <tbody> <tr> <td style="height: 40px;">_____</td> <td style="height: 40px;">_____</td> </tr> </tbody> </table>			Name of Inspector	Signature	_____	_____								
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_____	_____													

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- The welfare indicators were developed in consultation with welfare stakeholders.
- Our initial experience was that the protocol was practicable and quick, focused observation on the animals, and was repeatable.
- An advantage is that the protocol matches animal-based observations with current (facilities-based) legislation.
- It hence has a wide range of applicability:
 - suspected welfare breaches;
 - industry benchmarking;
 - farmer self-audit;
 - welfare QA purposes.


Next steps

- A follow-up project is underway to :
 - develop a training module, and train welfare inspectors;
 - perform quantitative validation of the protocol (reliability, repeatability);
 - develop an electronic recording system (PDA or similar) for data capture.

Executive summary - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://epicentre.massey.ac.nz/PigWelfare/



Indicators for the On-farm Welfare Assessment of Pigs

Outputs of MAF project 07 10487

<http://epicentre.massey.ac.nz/PigWelfare>

- » Executive summary
- » Project background
- » Literature review
- » Indicators for assessment
- » Development of an assessment protocol
- » Discussion
- » Assessment protocol
- » Contacts

This website presents the outputs of a research project carried out by the Institute for Food, Nutrition and Human Health (IFNH) and the EpiCentre at the Institute of Veterinary, Animal and Biomedical Sciences (IVABS), of Massey University, Palmerston North, New Zealand. The work commenced in August 2007 and was completed in June 2008.

The entire project report can be downloaded as a PDF by clicking on the icon at right. A synopsis of each chapter is available by using the menu at left, and these chapters can be individually downloaded.

Executive summary

This project identified indicators for the assessment of the welfare of pigs, which were compiled into a protocol for on-farm use. The aim was to develop a practical and workable tool which had an emphasis on animal-based observations, while maintaining the Minimum Standards, as defined by the Animal Welfare (Pigs) Code of Welfare (2005), as a touchstone.

A partial revision of the current legislation relevant to pig production, which is contained in the Code, is previewed for the near future. This Code predominantly defines environment-based parameters. However, animal welfare science is increasingly identifying and developing approaches for inclusion of animal-based observations. From this perspective, the provision in the Code of a greater number of animal-based criteria is desirable.

The methodology followed resulted in a general-purpose tool which can be applied in a wide range of circumstances. A

Acknowledgements

- The contributors to the workshops and participating pig farmers
- This work was funded by MAFBNZ (project 07 10487)



Thanks for listening!