People development program: 2011 Aquatic Animal Health Training Scheme - Introductory training in epidemiology and disease outbreak investigation

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1 Non Technical Summary

2009/315.20 People development program: 2011 Aquatic Animal Health Training Scheme - Introductory training in epidemiology and disease outbreak investigation

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OBJECTIVES:

1. Develop resources for training in introductory epidemiology and outbreak investigation for aquatic animal health professionals

2. Undertake training in introductory epidemiology and outbreak investigation for up to 25 aquatic animal health professionals

NON TECHNICAL SUMMARY:

Australia periodically experiences outbreaks of new or unusual diseases in both farmed and wild aquatic animal species. Recent examples include oyster herpes virus in New South Wales and Abalone Viral Ganglioneuritis in Victoria and Tasmania. Proper epidemiological investigation early in such outbreaks can assist greatly in identifying source and risk-factors for infection and can often provide clues for future control. Such an investigation goes beyond the identification and characterisation of the causal agent and is an essential part of the response to any disease outbreak or incursion.

To address this need, a training workshop on introductory epidemiology and disease outbreak investigation in aquatic animal health was held in March 2012. This workshop was attended by 10 aquatic animal health professionals from various states and industry sectors. Participants actively contributed to discussions and activities designed to help learn and understand the required knowledge and skills. Feedback indicated that participants found the workshop beneficial and that they will be able to apply what they learned in their work.

As a result of this training a small group of aquatic animal health professionals now have improved knowledge and skills in epidemiology and outbreak investigation and are better placed to respond to a disease emergency in aquaculture or wild fisheries. These people provide a core of skilled professionals to support the aquatic animal industries and on which to build and maintain into the future. Future planning should include running follow-up courses for those unable to attend this time or as an advanced course for current participants.

KEYWORDS: epidemiology, outbreak investigation, training, aquatic animal health.

2 Acknowledgments

The assistance of Dr Matt Landos of Future Fisheries Veterinary Service Pty. Ltd. in provision of data for use in teaching examples is gratefully acknowledged.

3 Background

Australia periodically experiences outbreaks of new or unusual diseases in both farmed and wild aquatic animal species. Recent examples include oyster herpes virus in New South Wales and Abalone Viral Ganglioneuritis in Victoria and Tasmania. Proper epidemiological investigation early in such outbreaks can assist greatly in identifying source and risk-factors for infection and can often provide clues for future control. Such an investigation goes beyond the identification and characterisation of the causal agent and is an essential part of the response to any disease outbreak or incursion.

This project will lead to improved knowledge and investigative skills of aquatic animal health professionals. This outcome will directly benefit the aquaculture and wild-caught fisheries industries through improved management and control of disease outbreaks and incursions. Consumers and the community will also benefit through improve reliability of supply and lower prices for products. The benefits of this project will be both private, to aquaculture and commercial fisheries through improved disease control, and public, to the consumer through assured supply of quality product at a competitive price.

4 Need

Specific training in epidemiology and the principles of epidemiological investigation has not been routinely provided to aquatic animal health professionals in the recent past. This project addressed this situation by providing introductory training in epidemiological principles and disease outbreak investigation for aquatic animal health professionals, and by making resources available for future training activities.

This project aligns closely with the Biosecurity and Aquatic Animal Health theme of the FRDC RD&E plan, directly through developing the necessary skills to prevent and manage disease incursions and indirectly through improved knowledge and understanding of biosecurity measures required to mitigate and control disease in cultured and wild aquatic populations.

5 Objectives

3. Develop resources for training in introductory epidemiology and outbreak investigation for aquatic animal health professionals

4. Undertake training in introductory epidemiology and outbreak investigation for up to 25 aquatic animal health professionals

6 Methods

Training resources for basic epidemiology and disease outbreak investigation for aquatic animals were developed. Resources developed include a manual for participants, including aquatic animal examples and case study. A course outline and teaching resources for a 3-day training workshop were also developed, based on the manual contents. Subsequently, a one-off, 3-day training workshop was delivered in Melbourne in March 2012, to provide training to 10 participants from a variety of institutions and backgrounds.

Teaching was based on exercises and group learning activities and included an introduction to the freely available web-based epidemiological software, EpiTools (http://epitools.ausvet.com.au).

All materials developed for the training program are available to FRDC for use in the future, either by AusVet or other providers.

7 Results/Discussion

A training workshop was held at Attwood Motel and Convention Centre, Melbourne on 13-15 March 2012. This workshop was attended by 10 aquatic animal health professionals from various states and industry sectors. Initial participant numbers were 18, but a number of late withdrawals and no-shows reduced the final numbers to 10. The final number of participants was less than expected but the group was active and participated well in discussion and activities. Most of the withdrawals were due to pressure of competing priorities rather than content or cost of the course. One withdrawal was no longer working in the industry and one was due to a car accident the day before the course. The reason(s) for the no-shows could not be determined. One option for addressing this for the future may be to require advance payment of a (nominal) registration fee to provide incentive and commitment to attend.

Participants were supplied with a printed manual and a USB thumb drive of electronic resources (available for FRDC). A list of participants is included in Appendix 3 and a revised course outline in Appendix 4. Feedback during the workshop was very positive and supported by written course evaluations at the end of the course (Appendix 5).

8 Benefits and adoption

Benefits from this activity will flow to all industry sectors through improved investigative capability and response preparedness at Commonwealth and State levels, as well as among veterinarians and consultants servicing the industry. Benefits could be consolidated by running follow-up courses for those unable to attend this time or as an advanced course for current participants.

9 Further Development

Potential for further development of this course include:

- modify course content based on feedback received, in particular including a topic on response planning and linking this in with outbreak investigation;
- repeat the current course to try and further develop skills and knowledge in industry stakeholders unable to attend this time;

- prepare and deliver a more advanced course as a follow-up to consolidate learning and skills for those who have completed the introductory course.

10 Planned outcomes

The primary outcome of this project is improved knowledge and investigative skills of 10 aquatic animal health professionals who attended the workshop. This outcome will directly benefit the aquaculture and wild-caught fisheries industries through improved management and control of disease outbreaks and incursions. Consumers and the community will also benefit through improve reliability of supply and lower prices for products. The benefits of this project will be both private, to aquaculture and commercial fisheries through improved disease control, and public, to the consumer through assured supply of quality product at a competitive price. These benefits can be further extended by periodically repeating this course (and/or a follow-up advanced course) to consolidate and refresh knowledge across industry stakeholders and sectors.

11 Conclusion

A training workshop on introductory epidemiology and disease outbreak investigation in aquatic animal health was attended by 10 aquatic animal health professionals from various states and industry sectors. Despite the disappointing attendance, participants actively contributed to discussions and activities and feedback indicated that they found the workshop beneficial and can apply what they learned in their normal work.

12 Appendix 1: Intellectual Property

No new Intellectual property was generated for this project. Existing materials developed by AusVet Animal Health Services were revised and extended to make them suitable for the current audience.

13 Appendix 2: Staff

This project was undertaken by Dr Evan Sergeant.

14 Appendix 3: Participant list

Surname	First name	Agency	Location	State
Roberts	Shane	PIRSA	Adelaide	SA
Dyrting	Kitman	NT DPI	Darwin	NT
Wortley	Steve	DAFF	Canberra	ACT
Ernst	Ingo	DAFF	Canberra	ACT
Hardy-Smith	Paul	Panaquatic	Hawthorn	VIC
Huynh	Christine	Future Fisheries Veterinary Service	Lennox Heads	NSW
Sierp	Michael	Biosecurity SA	Adelaide	SA
Moody	Nick	CSIRO AAHL	Geelong	VIC
Bergfeld	Jemma	CSIRO AAHL	Geelong	VIC
Leef	Dr. Melanie	Uni of Tasmania	Launceston	TAS

15 Appendix 4: Revised course outline

Introductory training in epidemiology and disease outbreak investigation

Attwood Motel and Convention Centre, 13-15 March 2012

Workshop outline

Session times will be 9.00am to 5.00pm each day, with breaks at (approximately) 10.30am, 12.30 and 3.00pm for morning tea, lunch and afternoon tea.

Session	Topic	Content
Day 1	Introduction(s) Workshop approach & objectives Housekeeping, etc	
1 – 2	*Introduction to disease outbreak investigation*	• Scope and objectives • Steps in the investigation
3	*Disease causation*	• Natural history / Ecology of disease • Mechanisms of disease transmission and spread of disease • Multi-factorial causes of disease • Risk/Causal factors for diseases • Necessary and sufficient causes • Evans' / Hill's criteria • Confounding
4	*Case Study*	• Introduction to case study
Day 2		
5 – 6	*Patterns of disease*	• Analysing spatial and temporal patterns of disease occurrence • Comparing level of disease among risk-factors • Interpreting results of analysis
7	*Diagnosing and screening for disease*	• Measuring test performance – accuracy and precision • Applying tests – interpretation at individual and group levels • Exercises on application and interpretation of tests
8	*Case study and discussions*	

Day 3

9 – 10	*Sampling populations*	• Sampling methods – random vs non-random • Sample size calculation • Bias • Sampling exercise
11 – 12	*Case studies* Workshop evaluation and close	• Case study discussions and examples

16 Appendix 5: Course evaluation summary

Ten participants attended the course, after a number of late withdrawals or no-shows. Of the 10 participants, 9 completed a course evaluation form.

Participants were asked the following 6 questions about the course and asked to score on a scale of Excellent, Good, Fair and Poor. Results are summarized in the table below:

	Excellent	**Good**	**Fair**	**Poor**
Appropriate level of detail of course presentations	7	2		
Usefulness of the class exercises & materials provided	6	3		
Opportunities for questions and discussions	8	1		
Speakers' knowledge of the subject matter	9	0		
Explanation of concepts by trainer (e.g. provision of adequate examples to illustrate key points)	6	3		
I will be able to apply what I learnt in my job	5	4		

Participants were also asked a series of text response questions, with responses summarized below:

1a. Did the workshop meet your expectations YES / NO?
All 9 respondents were **YES**

1b. If not, why not?
There were no additional comments for this question

2. Are there any topics that you feel should have been covered by the workshop but were not included?
Another detailed case study would have been useful
Inclusion of response planning in the initial disease investigation – would strongly influence early decision-making
Some brief introduction to emergency response approaches & policies. e.g. stages of response, response options, limitations for aquatics links to investigation approach.

3. Which part(s) of the workshop did you find the most interesting/useful?
The Koi carp study
Relevant case studies and discussions
Working through the example case – more Australian examples (would be good)
Case study & working in small group, using/exploring epitools, group discussions, PHS anecdotes & contributions re AVG, ISA, experience in industry & realities of working with/in industry, Evan
Use of epitools
Most parts very useful, very good materials and tools
Use of examples and practical use of epitools, well-structured and ordered list of topics
Steps in disease outbreak investigation, use of epitools (compare datasets and calculation of sample sizes), use of real cases of disease investigation data.
Being able to manipulate numbers to fit with a limited sample size

Which part(s) of the workshop did you find the least interesting/useful?

Confounding could have had a few more examples
(no other comments here)

Any other comments?
Thanks for your time, great refresher course, very stimulating
Great catering
Will come in handy when designing qPCR assay tests for monitoring marine diseases
It would have been good to take the case study through to an agreed investigation approach
Really interesting with relevant examples, really good opportunities for group involvement
Excellent workshop. Thank you Evan

I would like to attend future workshops on the following topics:
Aquatic animal health
Further disease investigation (more advanced course)
Yes (?)
Disease outbreak – case studies for different diseases (infectious/non-infectious) &/or different pathogens (viral/bacterial/parasitic)
Designing surveys in developing countries