

PROGRESS AND PRINCIPAL ACCOMPLISHMENTS

OBJECTIVE 1

Development of an online Fish Health Certificate Program for producers that will provide them with relevant risk assessment and management principles and practices to reduce losses due to fish diseases is now complete. Part one of the fish health certificate program included the development of a six module web-based learning program. Modules 1-6 of the asynchronous learning program have undergone peer review, revisions based on those reviews were made, and the modules have been published, available at http://ce.vetmed.wisc.edu/Fish_Producer_Courses. The modules contain information about:

1. Introductory principles and practices such as regional fish production, farm types in the NCR, principle culture systems, and the myriad of regulatory agencies involved in U.S. aquaculture.
2. Risk management and biosecurity methods that can assist producers in reducing the risk of introduction of diseases at aquaculture facilities. This module reviewed topics, e.g., Best Management Practices, loss events, continuing education, veterinary services, record keeping, and links to state and federal guidelines and policies.
3. Water quality management and monitoring, and disease prevention that includes reviews of water characteristics, physical and chemical water components, and effluent discharge at aquaculture facilities.
4. Fish health inspections, with particular emphasis on what producers should expect at an inspection, how producers can prepare for inspections, regulatory consequences, supplies and equipment required at an inspection, and how samples are collected, shipped, and what type of voucher specimens may be collected.
5. Veterinary health assessments and reports are presented showing typical results of a fish health inspection. Information included shows a producer how they can use the information to improve fish health management at their facility. This included a review of treatments and medications and the role of follow-up assessments.
6. Case studies describing diseases based on water quality problems, environmental diseases, bacterial infections and ectoparasites have been developed. Case studies specific to Koi herpes virus, largemouth bass virus, infectious salmon anemia, spring viremia of carp, and viral hemorrhagic septicemia have been developed based on actual “real-world” examples.

Evaluation and outcome assessment tools have been developed. Mechanisms are in place to collect data on the finished products.

Free access was provided for the complete online program for those that agreed to complete a pre- and post-program survey. To access the program, producers follow these instructions:

1. Go to VetMedCE.org
2. Click "Sign up now" to create an account (this is free)
3. Click on "Take a course"
4. Navigate to the courses by clicking on "Fish Health Courses for Producers and Veterinarians" > "Fish Producer Courses"
5. Click on the "Complete Fish Health for Producers Program" link at the bottom of the list
6. To take the program for free, click on the “survey link” on the course homepage.
7. Copy the access code from the bottom of the survey
8. Click the "Register" button on the original course web page
9. Paste the access code into the field on the RIGHT side of the screen

IMPACTS

The complete Fish Health Certificate Program was peer reviewed in the summer of 2011 and was published online (<http://www.ncrac.org/node/329>) in November of 2011. As of September 15, 2012, 268 participants from over 30 states and eight countries completed the course. As part of the course requirements, participants were asked to complete a short survey prior to taking the course (Pre-Survey), immediately following completion of the course (Post-Survey), and six months after taking the course (Follow-Up Survey). Information gathered was used to assess short-term and intermediate outcome indicators, as well as feedback for improvement of the course. Survey responses received are found in Appendix A.

Pre-Survey

The majority of course participants indicated they were taking the course to learn how to improve the health of fish on their farm/facility (74%), to learn what biosecurity for fish farms involves (62%), and to learn how to implement biosecurity on their farm/facility (52.5%). [Note: Respondents were able to choose more than one reason for taking the course]. A small number (4.7%) were required to take the course. Forty percent were taking the course following recommendations from another person.

Respondents were asked to rank their farm/facility on economic losses from fish health problems, and their level of disease risk, water quality and biosecurity. Most respondents reported having high water quality, low economic losses from fish health problems and moderate level of disease risk and biosecurity. When asked to rate the importance of various biosecurity measures, the majority of respondents rated water quality, cleaning and disinfection, and fish health assessment or inspection as extremely important, while record keeping, visitor control and diagnostic testing were rated slightly lower, but still ranked as important.

Respondents were asked to indicate outcomes they felt would occur from implementing biosecurity measures. Most respondents (90.9%) indicated that implementing biosecurity measures would serve to prevent disease from entering farm/facility. Many (84.2%) also felt it would increase the health of fish. Others (36.4%) indicated it had economic benefit and increases sales of product. A small minority (2.8%) indicated biosecurity measures were of no benefit. Twenty percent felt it would be an economic hardship to their farm/facility.

Almost half (47.3%) of the respondents reported never having had a fish health inspection/or fish health assessment conducted for their farm/facility. Of those indicating “yes” for having these procedures for their farm facility, 31.5% had a fish health inspection, 21.2% had a fish health assessment. Of those indicating “no”, 13.5% were interested in using them for their farm/facility. The majority (47.2%) of respondents felt current fish health inspection regulatory requirements seemed reasonable. Lower percentages felt there were too little requirements (7.6%) or there were too many requirements (6%).

Lastly respondents were asked about the availability and use of fish veterinarians in their area. Approximately one-third of respondents indicated they did not know if there were any aquatic veterinarians in their area. Another third were aware of an aquatic veterinarian in their area; twenty percent replied that no aquatic veterinarian was available for their area. Only 15.7% of respondents indicated ever working with an aquatic veterinarian on their farm/facility.

Post-Survey

Upon completion of the online course, participants were asked to take a short post-course survey. Only 61 of the 268 (22.7%) participants completed the post-survey. All respondents indicated the information in the course was very useful; almost half (41%) ranked the course as “extremely useful”.

Prior to this course, the majority (62.7%) of respondents had never attended an aquaculture biosecurity course/workshop. All respondents indicated they would recommend the course to others.

Respondents were asked their opinion about the level of biosecurity used on their farm (after taking the course). The majority (42.4%) felt their level of biosecurity was high, 22% indicated moderate levels of biosecurity, and 8.5% reported low levels of biosecurity.

Respondents were then asked to rate various biosecurity elements. This was a similar question to the pre-survey, and was used to see if the information contained in the modules, changed the participants knowledge or perception of biosecurity measures and importance. In the Post-Survey, all biosecurity elements (water quality, record keeping, visitor control, cleaning and disinfection, diagnostic testing, and fish health assessment) were rated as extremely important. Three parameters (record keeping, visitor control, and diagnostic testing) which were ranked as moderately important in the pre-survey, were increased in rank to extremely important in the post survey, potentially indicating an increased awareness of the importance for these biosecurity measures.

Respondents were asked how likely they were to implement new or enhanced measures of biosecurity on farm/facility after taking course. The majority (75%) indicated highly likely, 18.3% indicated somewhat likely and 3.3% indicated either not likely or it was required. Respondents were asked who should pay for the cost of fish health regulatory requirements. The majority (73.8%) of respondents indicated costs should be a combination of producer financing and State/or Federal funds. Twelve respondents (19.7%) felt producers should be responsible.

Follow-Up Survey

On August 21, 2012, a follow up survey was emailed out to participants (n=205) that had taken the course at least 6-months prior. Only 43 responses (21%) were received, however not all questions were answered by those responding. The majority of respondents (60.5%) indicated that they had implemented new or enhanced measures of biosecurity on their farm since taking the course. Biosecurity elements that were reported as enhanced from previous measures were cleaning and disinfection (60.7% of respondents), record keeping (60% of respondents), water quality (42.3% of respondents) and visitor control (40.7% of respondents). Most respondents indicated no enhancements for diagnostic testing (61.5% of respondents) or fish health assessments/inspections (48.1% of respondents). Respondents felt that the implementation of biosecurity measures helped in keeping diseases from spreading onto farms (65.5%) and increased the health of fish (58.6%)

The majority of respondents (42.1%) reported they had not worked with an aquatic veterinarian since taking the online course. Additionally, over half (52%) had not had a fish health inspection or assessment since taking the course.

Conclusions

Survey results from the Fish Health Certificate Program for Aquaculture Producers online course indicated this can serve as a useful tool to increase education and awareness of fish health and biosecurity issues in aquaculture for producers. For the majority of survey respondents (62.7%), this was the first aquaculture biosecurity course/workshop they had “attended”. The course was well received by participants, who also indicated they would recommend the course to others. Many participants reported implementing enhanced fish health and biosecurity measures at their facility or farm after taking the course, and almost half of the respondents on follow-up had had a fish health inspection or assessment conducted on their facility. The survey results suggest there may be a gap of information on where or how to identify aquatic veterinarians in the producers area.

Appendix A:

Survey questions and responses of participants taking the Online Producer Fish Health Course [November 11, 2011 thru September 15, 2012].

Pre-Survey

Question	Frequency No. (%)	No. of responses
Why are you taking this course? (Mark all that apply)		255
To learn how to improve the health of fish on my farm/facility	189 74.1	
To learn what biosecurity for fish farms involves	158 62.0	
To learn how to implement biosecurity on my farm/facility	134 52.5	
I am required to take the course	12 4.7	
The course was recommended by another person	103 40.4	
Please rank the following for your farm or facility.		
Economic losses from fish health problems		263
Low	86 32.7	
Moderate	51 19.4	
High	32 12.2	
Hard to say	12 4.6	
I am not a producer	82 31.2	
Level of disease risk		261
Low	55 21.1	
Moderate	84 32.2	
High	48 18.4	
Hard to say	9 3.4	
I am not a producer	65 24.9	
Water quality		261
Low	24 9.2	
Moderate	67 25.7	
High	97 37.2	
Hard to say	9 3.4	
I am not a producer	64 24.5	
Biosecurity		259
Low	44 17.0	
Moderate	71 27.4	
High	59 22.8	
Hard to say	21 8.1	
I am not a producer	64 24.7	

Question	Frequency No. (%)	No. of responses
Rate the following on its importance as a biosecurity measure.		
Water quality		264
Not important	6 2.3	
Minimally important	12 4.5	
Important	82 31.1	
Extremely important	158 59.8	
Not sure	6 2.3	
Record keeping		261
Not important	9 3.4	
Minimally important	22 8.4	
Important	113 43.3	
Extremely important	108 41.4	
Not sure	9 3.4	
Visitor control		262
Not important	16 6.1	
Minimally important	41 15.6	
Important	108 41.2	
Extremely important	86 32.8	
Not sure	11 4.2	
Cleaning and disinfection		262
Not important	5 1.9	
Minimally important	17 6.5	
Important	86 32.8	
Extremely important	147 56.1	
Not sure	7 2.7	
Diagnostic testing		261
Not important	5 1.9	
Minimally important	21 8.0	
Important	117 44.8	
Extremely important	104 39.8	
Not sure	14 5.4	
Fish health assessment/inspection		261
Not important	6 2.3	
Minimally important	9 3.4	
Important	102 39.1	
Extremely important	131 50.2	
Not sure	13 5.0	

Pre-Survey, con't

Question	Frequency No. (%)	No. of response s
What outcome(s) do you feel would occur from implementing biosecurity measures at your farm or facility? (Mark all that apply)		253
Increased health of my fish	213 84.2	
Increased sales of my product	92 36.4	
Prevention of disease entering my farm/facility	230 90.9	
Economic hardship for my farm/facility	53 20.9	
No benefit	7 2.8	
Has a fish health inspection or a fish health assessment been conducted on your farm/facility? (Mark all that apply)		260
Yes – fish health inspection	82 31.5	
Yes – fish health assessment	55 21.2	
No	123 47.3	
No, but I have heard of it don on other producer's farms/facility	21 8.1	
No, but I am interested in using them on my farm/facility	35 13.5	
How do you feel about current fish health inspection regulatory requirements that you are required to follow (Select one answer)		250
Too little requirements	19 7.6	
Too many requirements	15 6.0	
Requirements seem reasonable	118 47.2	
I am not a producer, but they seem too little	18 7.2	
I am not a producer, but they seem too much	8 3.2%	
I am not a producer, but they seem reasonable	72 28.8	
Do you have a fish veterinarian in your areas? If yes, have you ever worked with a fish veterinarian on your farm/facility?		261
Yes, there is a fish veterinarians in my area	85 32.6	
No, there is not a fish veterinarian in my area	54 20.7	
I don't know if there is a fish veterinarian in my area	88 33.7	
Yes, I have worked with a fish veterinarian on my farm/facility	41 15.7	
No, I have not worked with a fish veterinarian on my farm/facility	25 9.6	

Post-Survey

Question	Frequency No. (%)	No. of responses
After taking this course, what level of biosecurity do you feel you use on your farm? (Mark all that apply)		59
None	1 1.7	
Low	5 8.5	
Moderate	13 22	
High	25 42.4	
N/A	15 25.4	
Rate the following on its importance as a biosecurity measure.		
Water quality		61
Not important	0 0	
Minimally important	2 3.3	
Important	5 8.2	
Extremely important	54 88.5	
Record keeping		60
Not important	0 0	
Minimally important	0 0	
Important	16 26.7	
Extremely important	44 73.3	
Visitor control		61
Not important	0 0	
Minimally important	5 8.2	
Important	23 37.7	
Extremely important	33 54.1	
Cleaning and disinfection		61
Not important	0 0	
Minimally important	1 1.6	
Important	7 11.5	
Extremely important	53 86.9	
Diagnostic testing		61
Not important	0 0	
Minimally important	1 1.6	
Important	19 31.1	
Extremely important	41 67.2	
Fish health assessment/inspection		61
Not important	0 0	
Minimally important	2 3.3	
Important	19 31.1	
Extremely important	40 65.6	

Question	Frequency No. (%)	No. of responses
Who should pay for the cost of fish health inspection regulatory requirements?		61
Me, the producer	12 19.7	
State or Federal funds	4 6.6	
Combination of the above	45 73.8	

Question	Frequency No. (%)	No. of responses
How useful did you find the information contained in this course?		61
Not useful	0 0.0	
Somewhat useful	4 6.6	
Very useful	32 52.5	
Extremely useful	25 41	

Question	Frequency No. (%)	No. of responses
How likely are you to implement new or enhanced measures of biosecurity on your farm/facility after taking this course?		60
Not likely	2 3.3	
Somewhat likely	11 18.3	
Highly likely	45 75	
I am required to	2 3.3	

Question	Frequency No. (%)	No. of responses
Have you attended an aquaculture biosecurity course or workshop before?		59
Yes	22 37.3	
No	37 62.7	

Question	Frequency No. (%)	No. of responses
Would you recommend this course to others		61
Yes	61 100	
No	0 0.0	

6 Month Follow Up Survey

Question	Frequency No. (%)	No. of response s
It has been several months since you have taken the Fish Health for Producers On-line Web Course. Have you implemented new or enhanced measures of biosecurity on your farm?		
Yes	26 60.5	43
No	17 39.5	
If you answered yes, in what areas have you implemented new or enhanced measures of biosecurity?		
Water quality		26
None	12 46.2	
New measures	3 11.5	
Enhanced previous measures	11 42.3	
Record keeping		25
None	7 28	
New measures	3 12	
Enhanced previous measures	15 60	
Visitor control		27
None	9 33.3	
New measures	7 25.9	
Enhanced previous measures	11 40.7	
Cleaning and disinfection		26
None	6 21.4	
New measures	5 17.9	
Enhanced previous measures	17 60.7	
Diagnostic testing		28
None	16 61.5	
New measures	2 7.7	
Enhanced previous measures	8 30.8	
Fish health assessment/inspection		27
None	13 48.1	
New measures	6 22.2	
Enhanced previous measures	8 29.6	

Question	Frequency No. (%)	No. of response s
What outcome(s) do you feel you have seen as a result of implementing biosecurity measures on your farm/facility? (Mark all that apply)		29
Increased health of my fish	17 58.6	
Increased sales of my product	2 6.9	
Keeping diseases from spreading onto my farm/facility	19 65.5	
Economic hardship on my farm/facility	0 0	
No benefit	3 10.3	
Since taking the on-line fish health program, have you worked with a fish veterinarian on your farm?		38
Yes	10 26.3	
No	16 42.1	
N/A	12 31.6	
Since taking the on-line course, has a fish health inspection or assessment been conducted on your farm/facility?		39
Yes – fish health inspection	7 17.9	
Yes – fish health assessment	7 17.9	
No	15 38.5	
N/A	10 25.6	