

Fish Health: What you need to know (about regulatory inspections)

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Fish will die.

How do we stop that from happening?

- Minimize stress!
- Healthy fish in, healthy fish out
- Biosecurity
- Know your fish – what is ‘normal’?
- Control disease early
- Routine fish health exam/inspection
 - If regulators don’t require it, clients will

Fish health exam

- Part of “best management practice”
- Every other animal production industry does health exams
- Develop relationship with a veterinarian
 - Need to be familiar with farm and fish
- Investigate sick/dead fish quickly
- Consider fish health in your operating budget
 - Supplies, time, service fees

Do it yourself fish health exam

- Routine exam should be every 1-3 months
- Look for symptoms of stress
 - Increased parasites
 - Reduced growth rate
 - Reduced appetite or feed conversion
- Collect and analyze data
 - ‘Normal’ can change overtime
 - Helpful for diagnosis
- Sick/dead fish should be sent to lab
- Annual exam for non-regulatory pathogens

Fish health inspection

Regulations are meant to protect farmed and wild fish populations.

Common for all agricultural industries.

Fish health inspection

- The purpose:
 - Demonstrate fish are free of *certain* pathogens
- Applies to anyone moving live fish in the post-VSHV era
- Aquaculture is NOT zero risk.

Fish health inspection

- The challenges:
 - Regulations are highly variable
 - Rules can change frequently
 - Communication and justification is limited
 - Can be costly and logistically challenging
 - Process is confusing and unclear
- The solutions:
 - Understand the process
 - Build relationship with regulatory agencies

Fish Health Inspection: FAQs

- Who makes the rules?
- Who collects the fish?
- Who does the test?
- What tests are to be used?
- “Lot” vs “Farm”, what is the difference?
- What pathogens are you looking for?

Rules change quickly and are highly variable with many exceptions

FHI: Who makes the rules?

The receiving authority makes the rules!

+ Client requests.

FHI: Who makes the rules?

- Talk to the receiving state's "competent authority" on a regular basis

http://www.ncrac.org/import_regulations

- Do not rely on your client to do this
- Do not rely on last year's requirements

FHI: Who collects the fish?

- Inspector's role is to:
 - Confirm regulatory requirements
 - Certify fish are collected from correct source
 - Submit samples for diagnostic testing
 - Verify results and send to receiving authority
- Must be independent third party

FHI: Who collects the fish?

- Anyone recognized by the receiving state
 - Accredited veterinarian
 - Acceptable for all domestic and international inspections
 - MAY need additional fish health training
 - Fish Health Inspector or Fish Pathologist
 - Acceptable for all domestic inspections
 - Certified by AFS-Fish Health Section
 - Others (i.e. DNR biologists)
 - Be careful, sporadic acceptance
 - Typically little or no fish health training

FHI: Who collects the fish?

How can I find someone?

- Local diagnostic laboratory a good place to check, they know who is submitting samples

http://www.ncrac.org/import_regulations

- Ask other local aquaculture producers

FHI: Who does the test?

- Wide variety of labs
 - Government, private, University
- All labs should be following the same protocols
 - Quality control is highly variable
- USDA-APHIS certifies labs for (export) testing
- Prices and customer service vary, shop around

FHI: Who does the test?

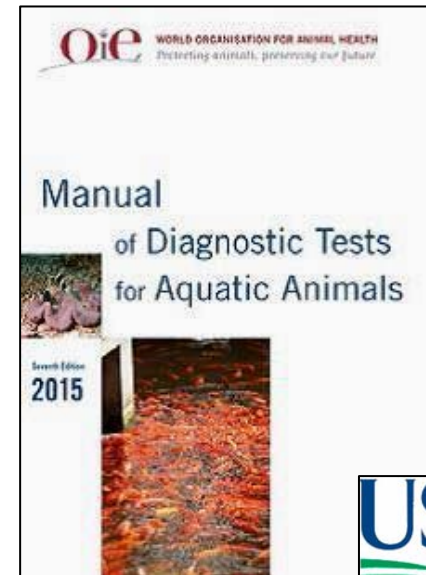
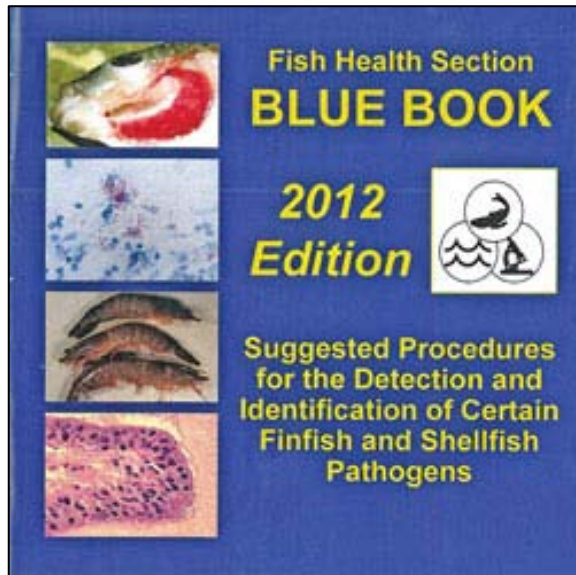
When sending fish to lab:

- Call to confirm availability
- Typically freshly dead on frozen gel packs
- Send overnight
- Fill out paperwork
- Check with receiving authority for other forms



FHI: What tests are to be used?

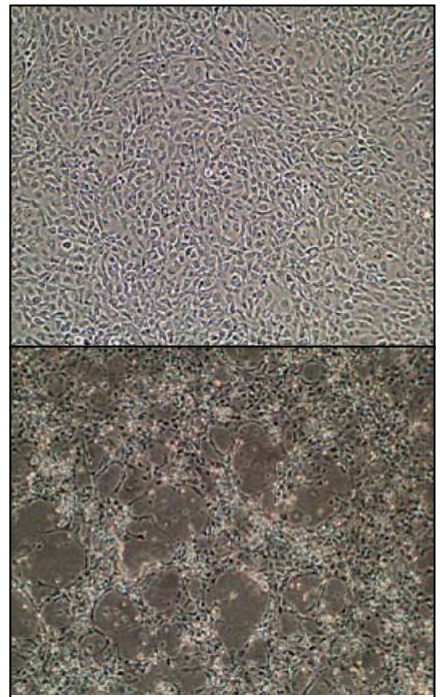
- Receiving state makes the final decisions
- Two diagnostic guidelines:



FHI: What tests are to be used?

Viral hemorrhagic septicemia virus

- Cell culture (aka Virus isolation)
 - Homogenize tissue
 - Grow the virus on a thin layer of cells
 - OIE: culture for 14-20 days
 - Blue Book: culture for 28 days
 - Common cell lines: EPC, FHM, CHSE
 - Cell culture is a non-specific test, can detect many viruses



FHI: What tests are to be used?

Viral hemorrhagic septicemia virus

- PCR
 - Faster, cheaper, and more sensitive
 - Used for to confirm suspect-positive cell culture
 - Being used for in-state testing of baitfish in MN
- Other tests
 - Antibody-based testing is available, but not common

FHI: What tests are to be used?

Turn around time

- Virology: 28 days (Blue book) or 14-20 says (OIE)
 - Bacteriology: 3-5+ days
 - Parasitology: 1-3+ days
 - PCR: 1-7 days
-
- Plan ahead!



FHI: “Lot” vs “Farm”?

Lot inspection

- Certify individual groups (or lots) of fish
 - Same species, age, water supply
- Pathogen exposure is equal to all fish in group
- Randomly collect the fish from the group

- Fish to be tested: 60 (5% APPL)
- Frequency: Annual

FHI: “Lot” vs “Farm”?

Farm inspection

- Certify entire farm (or facility)
 - May be multiple species, ages, ponds
- Pathogen exposure is not equal to all fish
- Proportionally sample the farm

- Fish to be tested: 150 (2% APPL)
- Frequency: Semi-annual or annual

FHI: “Lot” vs “Farm”?

Examples

Walleye producer with seven natural ponds stocked in the spring, harvested in fall

vs.

Producer with ten raceways at one facility with rainbow and brook trout of varying ages

FHI: “Lot” vs “Farm”?

- Be careful, the definitions can be confusing and there is gray area
 - Consult receiving state to confirm approach
 - Exceptions to the rules
- Biosecurity is required
 - Do NOT import fish of lower inspection history
- ‘Splitting’ the farm can be done, but it makes regulators nervous

FHI: What pathogens?

- “Certify fish are free of *certain* pathogens”?!
- Biggest source of confusion/frustration
 - What is important to one state, isn’t to another
- Depends on species, purpose, and location
- Starting point:
 - OIE list of certifiable pathogens
 - National Aquatic Animal Health Plan??
 - Not already endemic
 - Potential to cause serious disease to farm/wild fish

FHI: What pathogens?

What it really comes down to:

Risk tolerance of each authority

FHI: What pathogens?

- Should be a consistent and unbiased process
- Encourage a scientific review and/or risk assessment
 - Can it be introduced?
 - Can it escape?
 - Can it cause disease?
- Need to show the risk > cost
- VHSV vs. GSV

FHI: What pathogens?

Examples

- Yellow perch
 - VHSV, Heterosporis?
- Salmonids
 - VHSV, IPNV, IHNV, BF, ERM, WD, Cs?
- Baitfish
 - VHSV?, FHMNV?
- Tilapia? Barramundi? Exotics??

FHI: What pathogens?

- What about new pathogens?!
 - You look, you will find
 - Non-specific diagnostic tests
 - Be careful how you report the results
 - More states requiring to report “all replicating viruses” and THEN decide what to do...
 - SO far, have not seen major reaction since VHSV

What is next??

New and re-emerging pathogens

invasive and non-target species

Take home messages

1. Fish will die
2. There is inherent risk in aquaculture
3. Regulations are meant to help
4. Understand the inspection process
5. Communicate with regulators
6. Develop biosecurity plans and mitigate risks

Questions?

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