



Current Report

Cooperative Extension Service • Division of Agriculture • Oklahoma State University

FISH DISEASES AND DIAGNOSTIC SERVICES

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INTRODUCTION

Fish farmers need a basic understanding of the reasons why fish diseases occur and the steps they should take to reduce disease outbreaks. This publication is also designed to provide instructions on how to submit samples for fish disease diagnosis.

Most fish diseases are caused by stress. Stress is the reaction of an animal to any kind of irritation. This includes rough handling, poor water quality and many other factors. High levels of stress will weaken the natural defenses of fish, almost assuring a disease outbreak.

LEADING CAUSES OF FISH DISEASE

1. Improper Handling

- Sudden changes in temperature or pH as fish are moved from pond to hauling tank or vice versa. Gradual tempering should be done to avoid sudden changes of more than 5°F or 0.5 pH units when moving catfish.

- High ammonia levels in hauling tanks. Levels of more than 0.40 mg/l of un-ionized ammonia are definitely harmful. Fish should be starved several days before transport and recommended hauling rates observed.

2. Poor Nutrition

- Poor quality feed. All feeds used on commercial catfish farms should be labeled "complete" to indicate they contain adequate vitamin and mineral levels.

- Fish not fed during winter at recommended rates. See Southern Regional Aquaculture Center (SRAC) publication no. 181.

3. Poor Pond Management/Design

- Ponds never drained and dried. To avoid water quality problems and certain diseases associated with high levels of organic matter, it is probably best to dry pond bottoms at intervals of somewhere between 3 and 8 years.

- Wild fish and fish eating birds allowed access to pond. Saran filter cloth should be used to filter water from creeks and reservoirs. Ponds should be patrolled regularly to scare off birds.

- Water flows from pond to pond, allowing spread of disease organisms. Ponds should be designed so that they drain and fill independently, whenever possible.

4. Poor Water Quality

- Dissolved oxygen below 2.0 mg/l. See SRAC publications 370 and 371.

- Un-ionized ammonia levels above 0.04 mg/l for 2 weeks or above 0.40 mg/l for 1 day.

- Chloride to nitrite ratio of less than 6 to 1. Salt is a cheap and effective preventative treatment for high nitrite levels.

- Sudden pH shifts due to heavy rainfall and/or total alkalinity of less than 50 mg/l. Good studies on this have not been done, but a change of more than 1.0 pH unit after a rainfall or 2.0 pH units over the course of a day is likely to be harmful. Adding agricultural limestone is the most common means of raising total alkalinity so that large pH shifts can be avoided.

Poor water quality is the leading cause of stress in farm raised fish. Commercial fish farmers must regularly test water quality factors and act to avoid problems. Oklahoma State University and Langston University jointly offer workshops on how to do this. Learning the basics of water quality management is fairly simple and requires only a day.

DISEASE SIGNS

In addition to working to reduce the common causes of disease discussed above, the experienced fish farmer is constantly looking for the following signs of disease:

1. Reduced feeding - If it cannot be explained by one of the following:

- A disturbance of some sort: seining, fishing in pond, fish eating birds.
- A cold front or heavy rain that dropped water temperatures.
- Chemical application of some type.
- Change in feeding practice: different vehicle, extra people, different time of day, different feed.

2. Strange swimming behavior

- Crowding around water inlets.
- Hanging listlessly close to surface.
- Flashing: Rapidly turning on their sides.
- Motorboating: Erratic swimming with head pushed out of water.
- Rubbing against bottom, perhaps causing pond to turn muddy.

3. Abnormal appearance

- Sores
- Redness around mouth or anywhere on body
- White, grey or red spots
- Bulging or sunken eyes
- Bulging abdomen
- Excess or discolored slime on body
- Gills other than normal red color
- Swollen, eroded, ragged or discolored fins
- White lips, pale or colorless blood

DIAGNOSTIC SERVICES

As soon as fish showing signs of disease are observed, you should contact a qualified fish disease specialist. The fish disease information sheet attached to this publication should be filled out before calling and then sent along with any samples. The Southeast District Fish Disease Diagnostic Laboratory is located in Ada. Dr. Marley Beem can be reached by calling (405) 332-4100. There is no charge for diagnostic services at present.

Other sources of diagnostic help are also available. Dr. Conrad Kleinholz operates a diagnostic lab on the campus of Langston University in Langston. He can be contacted by calling (405) 466-3836. Theop Inslee is a certified fish pathologist and does diagnostic work at his fish farm in Connerville. His number is (405) 836-7150.

Five sick fish should be collected for examination. Use a dip net to catch fish that show any of the disease signs listed above. Collecting fish that show good signs of disease is difficult, but the diagnosis can be no better than the quality of the sample you submit. It may be necessary to spend an hour or so in a boat trying to catch fish with a dip net. Some producers feed on one end of the pond and then search the other end of the pond since sicker fish will not be taking feed. Do not collect fish by hook and line - Only healthy fish will take a hook. Dead fish are useful only if some red remains in their gills. Even then they are a poor second choice compared to live fish.

If you are not experienced in transporting live fish and are more than an hour away from the lab, place the fish in water tight plastic bags without water and pack the bags in crushed ice. Be sure to use separate bags for each pond, tank or cage. Fresh fish packed in this manner will remain suitable for examination for up to 12 hours. Do not freeze or preserve fish with chemicals since these methods destroy external parasites and many systemic bacteria.

The best way to transport fish is alive in a picnic cooler or other container in which water is oxygenated by agitator or compressed oxygen. The ideal temperature for transporting most fish is around 65 °F. To cool water, a small amount of ice can be sealed in a plastic bag and added. Do not cool water below 65 °F, since this will cause most external and gill parasites to drop off.

One quart of pond water should be collected in a clean glass jar and placed on ice while being transported to the lab. To fill the jar turn it upside down, place it about 10 inches below the surface, turn it over and allow it to fill, and then replace the lid. Water samples must be kept on ice to prevent algae and bacteria in the water from changing levels of ammonia, nitrite and other factors. Your water will be tested to determine if harmful levels of fish waste products or other factors are present.

Your fish will be examined under the microscope to check for parasites on the gills and body surface. Next, samples of the brain and kidney will be removed and placed on nutrient media to determine if any pathogenic bacteria are present. If bacteria grow on nutrient media then they will be further tested to determine their identity and sensitivity to antibiotics.

A full diagnosis requires from 24 to 48 hours, but the disease specialist may suggest treatment alternatives before tests are completed. You will be contacted by phone if any serious problem is diagnosed. A written report will be sent to you once all tests are complete.

DISEASE TREATMENTS

If a chemical or antibiotic treatment is recommended, take care in calculating and applying it. Simple mistakes in arithmetic have killed many fish, so double check your calculations. Chemical treatments require that you measure pond volumes within 10% of the actual volume. Ask the diagnostician for advice on measuring pond volume and methods of applying chemicals to obtain the best results.

Sometimes you will be advised simply to maintain good water quality and nutrition and not to use any chemical or antibiotic. This is a difficult recommendation for most fish producers to accept. Here are the most common reasons why chemicals or antibiotics may not be recommended:

- No legal therapeutic compound is available that has any positive effect for the disease in question.
- The value of fish that might be saved is less than the cost of the therapeutic compound.
- Fish may be in such poor condition that the stress of a chemical treatment is likely to kill them.
- Harvest may be a better option, when quality of the dressed product will be unaffected by the disease.

PESTICIDE KILLS

Pesticides are sometimes responsible for fish kills. If you have reason to suspect pesticide contamination, you should immediately collect one gallon of water in a clean glass container and refrigerate it. Place aluminum foil over the mouth of the bottle before screwing the lid on. At the same time, collect several freshly dead fish, wrap them in aluminum foil and freeze them. Other dead animals should also be collected and preserved in the same manner as fish. Label all samples with date and time of collection. Contact the fish disease specialist for further advice.

FISH DISEASE INFORMATION SHEET

OSU Fish Disease Diagnostic Laboratory
Ada, Oklahoma (405) 332-4100

Name _____

Address _____

Telephone _____

Lab Use Only:

Date Rec. _____

Case No. _____

Est. Value _____

1. Pond Number or Name _____

2. Water Temperature _____
(10 inches below surface)

3. Fish are from which of the following?
(circle A,B, or C)

A. Pond

size = _____ surface acres
or ___X___ feet

depth = ___ feet

Number of fish in pond? _____

B. Cage

Cage size = ___X___X___ ft

Number of fish in cage = _____

pond size = _____ surface
acres or ___X___ feet

pond depth = ___ feet

number of fish in pond = _____

C. Other: _____

(describe)

Total number of fish = _____

4. Describe any change in water color or
odor

5. Have any other animals died in or around
pond? yes no

If yes, describe:

6. How many fish died?...

- The day these fish were
collected? _____

- 1 day before? _____

- 2 days before? _____

- 3 days before? _____

7. How much feed was eaten?...

- The day these fish were
collected? _____

- 1 day before? _____

- 2 days before? _____

- 3 days before? _____

8. Has there been any runoff into the pond
recently?

yes no

If yes, how much was there?

light medium heavy

How many days ago? _____

9. What treatments have you already applied
to the fish or pond? (give chemical,
pesticide or antibiotic name and amounts
applied)

10. Additional pertinent information

11. Please attach recent water quality records,
if available.

SOME COMMON MYTHS AND MISCONCEPTIONS

"Harmful bacteria or parasites are responsible for my fish disease problem"

Fish live in an environment full of disease organisms but can usually remain healthy because of their immune system. Just as you can avoid catching a cold if you get adequate rest and keep warm, fish can avoid or recover from many diseases if they are handled gently, receive proper feed and enjoy good water quality conditions.

There are some diseases in which no disease organism is involved. Brown blood disease for example, is caused by high levels of nitrites.

"Chemicals or antibiotics provide a quick cure for all diseases"

Underlying problems such as poor water quality or inadequate nutrition must be corrected before any chemical or antibiotic treatment can be completely successful.

The number of chemicals and antibiotics licensed for fish diseases is few and there are certain diseases for which no therapeutic compound is available.

"I can identify diseases on my own"

The signs of disease listed earlier and photos of diseased fish from textbooks will not allow you to identify specific diseases. The same disease signs are shared by many diseases.

A good microscope, costing several thousand dollars, is needed to detect and identify most parasites. Time and effort is required to learn how to use one. Other equipment and advanced training is needed to isolate and identify bacteria and viruses.

"Regular preventative treatments with chemicals is a good idea"

Most disease treatment chemicals damage delicate gill tissue and cause fish to cease feeding for several days. Do not apply any chemical unless a real problem has been diagnosed. The only exception is the use of salt in hauling tanks or ponds.

"Regular preventative treatment with Terramycin is a good idea"

To do so runs the risk of developing a resistant strain of bacteria. This is a very serious situation since no other antibiotic is approved for catfish, except in the case of Enteric Septicemia of Catfish (ESC).

It may be justifiable to feed Terramycin treated feed if fish have been severely stressed by rough handling or poor water quality. Cases of severe stress might be assumed in the following instances:

- Fish fail to feed aggressively within 5 days after stocking.
- Some of the fish in a pond are killed by low oxygen levels.
- Dissolved oxygen levels fall below 2.0 mg/l for more than 6-8 hours.

"I can determine a treatment on my own"

A knowledgeable fish farmer can often guess at a treatment that will work, but still risks wasting money or unnecessarily stressing fish if a full check for bacteria, parasites and water quality problems is not done.