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erik L. JOHNSON DVM



- Fish keeper since 1973
- Author "Koi Health & Disease" 2006 Reloaded
- Author "Fancy Goldfish"
- Internet: Koivet.com



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overview of "Filtration"



- Skimmers
- Bead Filters
- Matting Filters
- Pressure Filters
- Vortex Filters
- Bog Filters
- Nexus Filters



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Biofalls and skimmers



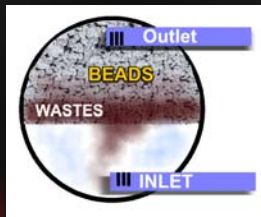
- Water is gravity fed to skimmer
- Pushed through filter in waterfall
- Returns to pond and adds aeration
- Usually no bottom drain.
- Usually has gravel on bottom which requires occasional cleaning
- **Extremely LONG neglect interval ☺**



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Bead Filters Schematic



- Frequent but easy maintenance
- Media lasts forever
- Relatively high head pressure, water is PUSHED through filter ☹
- Cannot stop filter in summer ☹

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Bead Filters



- Water flows up through cake of beads
- Mechanical removal of waste
- Biological functions are good after 6 weeks
- Do not over wash beads
- Short neglect interval ☹
- If filter stops = Anaerobic disruption ☹

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matting filters



- Layers of matting provide mechanical and biological reduction.
- Matting must be cleaned depending on your feeding rate and interval
- Long neglect interval ☹
- Overflow or channeling with long neglect interval
- Can be stopped. ☺

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pressure filters



- Usually small, for smaller systems.
- Usually poor ☹
- I'd put a gun in my mouth and jerk the trigger before I'd run one again – ever.
- Also known as canister filters
- Often proprietary parts.
- Usually low capacity
- Cleaning is a pain.

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vortex filters



- Water gravity feeds through conical vessels
- Each cone does a different thing
- **Best part: Water is supplied to pump via gravity ☺**
- Head pressure on pump is minimized
- Long neglect interval

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sponge filters



- Extremely simple
- Very effective ☺
- Air powered or water pump powered
- Easy to clean
- Medium neglect interval ☺

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Bog Filters

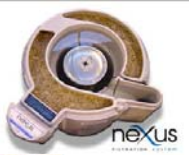


- Extremely long neglect interval ☺
- Can be cleaned with sludge digesting bacteria, peroxide, permanganate
- Totally hidden ☺
- Low cost
- Avoid plants please



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Nexus Filters



- Proprietary parts from the UK
- Large vessel
- Open design withstands stopping
- Floating beads
- "Self cleaning"
- The "Answer" central water movement system



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Bio-adjuvants



- Advances in microbiology that enhance filtration or fish performance
- Sludge digesters are the most dramatic example.



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Sludge Digesters



- Microbe Lift
- S.A.B.
- Winston Companies
- Anderson Bio
- Most are various colonies of bacillus subtilis
- Drastically reduce the accumulation of solids in filtration media
- May make obsolete the need to tear apart gravel beds



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Nitrogen Reducers



- Hard to package, if not impossible.
- Fritz Industries Turbo Start is best, Shipped overnight.
- Ammo Down BRF13A
- Ki Nitrifier also seems to work pretty well.
- Most take longer than promised.



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Nucleotides



- Refined proteins from the cell wall of Saccharomyces yeast
- Have immune stimulant functions
- Highly bioavailable proteins seem to speed growth.
- Immune support functions are verified but non specific.



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ozone



- Powerful oxidizer from a machine.
- Produces ozone which oxidizes organics
- Units have traditionally been very expensive
- Unreliable and dangerous in some deployments.
- www.cwtozone.com/



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ozone production



- Dry Oxygen can be pushed through an ozone chamber.
- Inside the chamber, tiny "lightning strikes" come from brush to wall.
- The oxygen picks up generated ozone.
- Ozone is pumped through airstone into water.
- Ozone must be "reacted".



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ozone reaction



- A chamber (little more than a bucket) AFTER the ozone generator where the water can de-compose the O_3 into O_2
- Too much ozone can kill fish



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ozone Functions



- Clarifies water like carbon
- Kills bacteria like UV
- Kills algae like UV
- Kills parasites
- Improves DOC like Potassium permanganate
- Removes organic nitrogen toxins like ammonia and nitrite



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ozone measurement



- Largely a "guess" based on the ORP reading –
- ORP is oxidation-reduction-potential of water.
- Or not measuring, just react in a waterfall!



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Ultraviolet Clarifiers



- A water filled tube in which a bulb emits rays that disrupt all DNA that passes through
- Kills bacteria, algae, viruses
- Bulbs last 9 months
- Quick algae control



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What They are

How a UV works



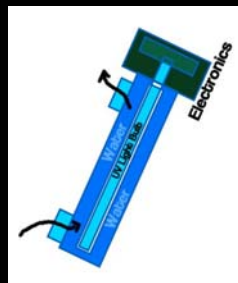
- Precision crafted to mix water around a light bulb.
- The light bulb emits ultraviolet rays and the UVB radiation kills bacteria algae and viruses.



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What They DO

- UV can kill bacteria
- Algae
- Viruses
- Very small protozoans like Hexamita and Costia



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What They DON'T DO



- They don't prevent the spread of bacterial or viral diseases
- They don't kill things OUTSIDE the tube
- They don't immune suppress the fish
- They don't kill the filter's beneficial bacteria
- Only DNA that goes in the UV gets disrupted



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end of Filtration & Bio adjutants




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CONTROL OF BACTERIAL INFECTIONS



- Dr Erik Johnson
- Koivet.com
- Author of Koi Health & Disease 2006 Reloaded
- Author "Fancy Goldfish"





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CONTROL OF BACTERIAL INFECTIONS



- Time is of the essence
- Infections usually work from outside in.
- If damage to internal organs is too great, you lose anyway.
- HEAT is your greatest ally, correction of environmental issues, then antibiotics.

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Understand the Venn Diagram



- Always, infections are caused by the condition of the fish, the water or environment then, the third player is the pathogen.

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Bacteria Don't cause infections



- NEVER EVER
- Always, the environment or other contributor SETS UP an infection.
- So then controlling the infection isn't the "Thing"? Is it?
- Control the contributors.

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One Fish • All Fish



- Realize that when ONE fish has an infection, all fish in that system have been exposed to the contributors and the pathogens. All are infected to some greater or lesser degree.
- Makes you a smarter fish buyer, at least.

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There are a series of contributors.



- Crowding
 - < 1 inch fish per ten gallons of water.
- Ammonia, Nitrite, Nitrate
- pH being low
- Clouding in the water
- Warm water with low dissolved oxygen!!!

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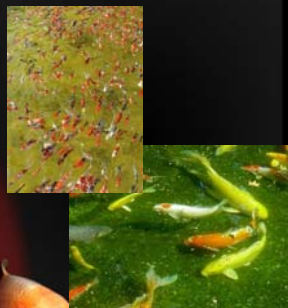
all the medicine in China.



- Failure to FIX the above contributors means NOTHING you deploy will fix the infection.
- Because the causes are still there.

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give the Fish what They Want.







- Koi are riverine fish.
- This means they want moving water, CLEAR water, LOTS of water and healthy low bacterial count water.
- Limiting crowding, and a nitrate reducer.

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rule out co-infections

- Either use a scope or...
- Use a shotgun remedy
- Here's a Good One
 - Salt 0.6%
 - Dimilin (Anchors Away)
 - Prazi™ or Parasite Clear (Jungle)

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"THE SHOTGUN KING"












- This would "fix" almost everything...
- Heat 76-78
- Salt to 0.3-0.6%
- Prazi or Parasite Clear (Jungle)
- MediKoi (Medicated food)
- +/- Dimilin

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rule out KHV vs. BACTERIAL INF.

- There're tests of course
- Samples.koilab.com
- Head down, tail up
- Blanching gills
- Fish recently moved into low seventies.
- Bought new fish without quarantine

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Okay Then Let's Kill Bacteria!



- Fish have to have what they want, THEN they will respond to treatments.

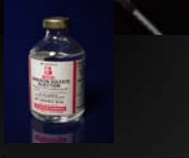


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in all instances, injection is "king"



- Injection of antibiotics gets WHAT you want, WHERE you want it, WHEN you want it. And it's safe.
- Baytril is best, Azactam is second best.
- Combinations.



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How To inject



- Fish can be sedated
- Can be in plastic bag
- Can be in Koi Sock
- Inject every day or every other day
- No more than 3-4 injections!



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im versus ip injections




- IM is safe but seems to be more difficult
- Can mark the fish
- IP is safe and leaves no mark
- Faster absorption –
- IP is the way I prefer to go

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ip injection



- The best spot is under the ventral fin, in the “pit” there.
- It’s penetrable on even the largest of Koi

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How to entubate



- Red rubber feeding tubes are best
- 4-8 French are good.
- Shouldn't be larger than the PUPIL of the eye.
- Lay on fish for “depth”
- Insert into gullet.

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Feeding Medicated Food

- RometB is off the market, just in time, everything was resistant to it.
- MediKoi is the best for now. There are two kinds, both have their meds milled in.
- Not top dressed.
- Feed every day. Don't feed other foods for the week.
- Usually a week is enough.
- May have to "Spot Feed" a sickie.



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How to Dress Wounds

- Sedate the fish to avoid more stress.
- For Debride® which is my favorite
- Blot "dry" twice.
- Dab on Debride
- It will stay on at least 15-25 minutes.
- If the wound is not "dry" it will last 2 minutes.



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How to Use Tricide

- Sedate the fish, or not.
- Put them on the counter if sedated.
- In a plastic bag if not.
- Mix up a gallon of Tricide
- Spray on the fish for THREE minutes
- Treat daily for three treatments.



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POTASSIUM PERMANGANATE FOR INFECTIONS



PP is a good treatment for bacterial infections in lake fish in COLD water, not warm water.

- Treat to 4 ppm
- One tsp per 600 US gallons
- Do not overdose
- Bypass the filter
- May reverse with a small amount of hydrogen peroxide
- Treat every FOURTH day.

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Treating infections in TINY Ponds / Tanks



- Easier to heat, so do it!
- Inject!
- Add no meds to the tank
- Feed Medicated Food
- Salt to 0.3%

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Treating infections in regular ponds



- More difficult to heat
 - But if you can – 74-78 ideal
 - How fast? One degree per hour.
- Set up Q Tank
- Heat in A Tank
- Aerate Well
- Salt 0.3%

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Killing Bacteria in the Q Tank



- Injections Ideally
- If not possible:
 - Tricide Neo Dipping EOD
 - Medicated Food
 - Dress Wounds with Peroxide



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Lakes



- Individual Handling Out of the Question
- Potassium with Peroxide Reversal
- Medicated Food
- Fast the fish, feed in a centralized location.
- Prayers.



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Thank you!



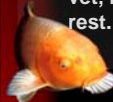
- Thank you! Do you have any questions about treating bacterial infections?
- Of course, you'd fix the causes of bacterial infections before trying to kill the first bacteria, RIGHT????



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Control of Parasites

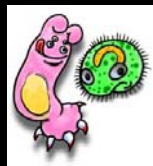
- Dr. Erik Johnson
- Univ. GA 1991 DVM
- Author "Koi Health & Disease"
- Author "Fancy Goldfish"
- Biggest fish vet in the world. (375 pounds)
- Not the smartest fish vet, but I can beat up the rest.



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There are three types of parasites

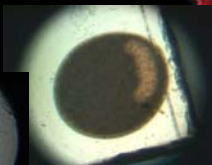
- They're similar within their classes
- They die similarly too



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Ciliated Parasites

- Ich
- Trichodina
- Costia
- Chilodonella



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ich – What about it?



- Ich causes white spot disease
- Serious damage is to the gills
- May not see white spot disease
- Common in cold water
- Uncommon in warm water
- IMMUNE to your efforts while under skin



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ich Treatments

- Salt is best
- 0.3% for 7-10 days
- Longer in cold (<72) water
- Formalin is useless
- Most meds are useless




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Trichodina – about it?

- Loves dirty ponds
- Easily survives in clean ponds
- Eats fish slime
- Makes fish crazy with itching





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Trichy Treatments

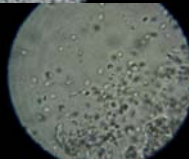
- Half of Trichodina is salt sensitive
- 0.3% (3lbs per 100gallons)
- The other half is salt resistant.
- Potassium Permanganate daily is good, so is Formalin
- Let's talk about Formalin with Costia



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Costia – What about it?

- Costia is the smallest parasite we see
- Horrific gill damage
- Big Springtime killer
- Hard to find under scope for most folks
- Must see a movie to “get it”



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Costia Treatments



- Most Costia lives through salt
- Formalin is best
- 50ppm Koi – 120 minutes then water change
- 25ppm Goldfish – 120 minutes then water change
- Large ponds: Drain pond 1/2way then add dose. Start refilling at once.



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Chilodonella – all about it

- Springtime killer
- Shaped like a man's ear
- Vomits it's stomach to eat.
- Bigtime fish killer
- Always sensitive to salt 0.3-0.6%







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Chilodonella Treatments

- Salt at 0.3% or 0.6%
- Leave in for 10 days
- If plants – use Potassium daily.

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Potassium Permanganate

- Caustic sandy, alkali
- Turns water purple
- Very dangerous if careless
- 1 tsp per 600 gallons gives 4 ppm
- For ciliates, treat daily, for four to five days in a clean pond.
- For flukes, treat every fourth day in a clean pond





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epistylis/scyphidia/trichophrya

- Relatively rare. All salt sensitive. Usually in Bass ponds. Not Koi ponds.



EPISTYLIS







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CRUSTACEAN PARASITES

- All of these you can see with the naked eye.

Anchor worm - *Lernaeus*



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Lernaeus - about it

- This is the Anchor Worm
- It's a little larva for seven moults
- Females embed under scale
- They do a lot of damage
- Sometimes hard to see
- Fall disease.




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Lernea control

- Simple, Dimilin or other chitin synthesis inhibitor.
- Best known one is Anchor's Away
- Also, Dimilin from API and Express IDI on the internet.
- Simply apply this to the water and in 3-4 days the worms drop off.



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argulus – about it

- Argulus is the Fish Louse
- It's a saucer shaped parasite
- They bite! You and the fish.
- Their babies chew on your fish for seven days before they show up mature
- Fall Problem too.



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argulus control

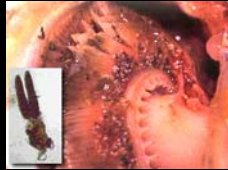
- Dimilin controls it quickly
- Simply apply this to the water and in 3-4 days the worms drop off.



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ergasilus – control

- Gill Maggots
- You raise the gill cover and you'll see a bunch of banana looking things sticking out of the gill material. They attach to the red part of the gill.
- Dimilin controls it quickly
- Simply apply this to the water and in 3-4 days the worms drop off.



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Trematode Parasites

- Flukes – The scourge of the fish industry
- Why? Used to be hard to treat. Not anymore.
- But they're not salt sensitive, and they carry Aeromonas on their hooks!



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gill and skin Flukes

- They have hooks on their bottom which damage fish and inoculate bacteria.
- Gill flukes don't care about the gills or skin.
- Skin flukes don't care about the skin or gills.
- They all think of the Koi as a giant ice cream truck.



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Fluke Control – Tanks

- Simple, SupaVerm, Prazi, Parasite Clear (also contains Praziquantel) or Fluke Tabs in tanks is the easiest.



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SupaVerm Particulars

- SupaVerm – Sheep dewormer, internet usually, 1cc per 100 US gallons day one and day two. No filter effects, no fish or plants effects. SUPAVERM KILLS ALL EXPOSED GOLDFISH.
- If your fish have a bacterial co-infection from the Flukes, the fish will still die of the bacteria despite the SupaVerm. This could cause a person to think the SupaVerm killed their Koi.



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Fluke Control – goldfish

- They cannot have SupaVerm. You should use Prazi™ or Parasite Clear from Jungle.
- Simply deploy the Prazi or Parasite Clear according to label instructions and you're set.
- What About Potassium, or Formalin?
 - These work fine, but at much higher risk, with filter-effects.



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Fluke Control - Koi in Ponds

- Simple, again, SupaVerm, Prazi, Parasite Clear (also contains Praziquantel) work in ponds. Yes, it will be sort of expensive. Use enough, and always treat twice.



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Flukes in Large Ponds



- Flukes in large, large ponds... You have to resort to the organophosphates like Trichlorfon, Trichloride, or Malathion. Malathion is my favorite. Dosing is in the book. Do not use Malathion in cold water (<68) or hot water (>78) because of it's absorption in those temps.



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Thank you!

- Hopefully you understand that there is no real, silver bullet.
- Most parasites require a sort of different approach.



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Cutting Retail Losses



- By Dr. Erik Johnson
- Hopelessly addicted to Koi
- Has seen a lot of stores
- Has kept a lot of fish.
- Knows the filtration because he uses or has used it all.
- Blah blah blah



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"Doing" Fish at All?



- Fear mostly prevents folks from this profit center.
- Fear of loss
- No regional demand
- Liability to consumer



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Koi are not azaleas

- Rummaging around in a tank for a "good one" for the customer.
- Throwing out a bad one with a sore or rotten mouth
- If one azalea dies, it doesn't usually bode poorly for the rest.
- Disposability remains with Azaleas because they don't get named. Fish do.



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import versus domestic?



- Import fish involve much less risk
- Domestic supplier accountability
- Japanese fish more attractive, but more expensive and more stressed by travel



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domestic koi



- Bright colors
- Not so keen on pattern
- Hardier because of less transport to you.
- Accustomed to North American climes.



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imported koi



- Can be from Japan, Israel or Indonesia
- Brighter color
- Better patterns
- Cheaper labor and production costs
- Make it up on shipping
- Cost more, sell for more



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Selected Wholesale Resources

- IMPORTS
- Pacific Koi
- Keirin Koi
- USA Koi
- Eastern Nishikigoi
- Mag Noy
- Hazorea

- DOMESTICS
- Blue Ridge Fish Hatchery
- Blackwater Creek
- Brett Rowley
- Kloubec
- North Prairie




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First – need a point guy



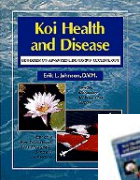


- Koi Leader
- Accountability
- Record Keeping
- Education
- Cross Training
- Attention to Detail
- Answer the better questions






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Their Education

- Book: Koi Health & Disease
- Send to classes, such as the one at University of Georgia every year.
- Aquascape University

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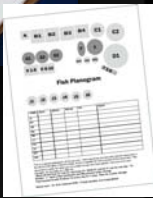
Their rewards



- Pay increases based on:
- Finishing chapters
- Implementing quality control
- Courses taken
- Measurable decreases in fish loss
- Measurable increases in fish sales

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Their records



- A clip board
- A daily husbandry form
- Use pencil, it doesn't smear
- Make sure the form is comprehensive. See handout.

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YOUR FOLLOW THROUGH



- If you don't look at the form, they'll dry lab it.
- Look for trends
- Look for loss trends
- Look for sales trends

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sample form



- Decide how often to assess.
- Daily?
- Mon, Wed and Friday?
- Emphasize it.
- Review it.
- Pay raise based on it.

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most common retail losses



- Noticing disease too late
- Mixing new and established inventory
- Failure to quarantine
- No scope
- Power failure

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set up of retail

- Your customer is the "relative newbie" with a casual interest.
- KISS principle without leaving them blindsided
- SIGNAGE!!!
- Education!!!
- Knowledgeable staff!!!
- "DESTINATION"

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Fish Retailing Systems



- Polyurethane durability in two layers,
- Tremendous filtration capacity
- Attractive color
- All in one solution
- Easy to modify for central flows.



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The Overflow



- A bulkhead is drilled through the back of the RIGHT vault at the desired water line. Allow water to fall.
- Water goes outside to plants or something



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The Tubing



- Replace the sharp 90° elbows and PVC with soft Flex PVC tubing and a smooth, minimal head-loss bow.



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The Net Cover



- Attached with cord locks at the back and held down up front with hasps.



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The Trickle System



- Best of both worlds, always new water, no disease transmission from tank to tank
- Icemaker water line is great for this.



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constructed ones



- Wood, block, in ground, often cheaper than the slick factory prepped units.
- But, they can look home made too, which deprives you of some sizzle.



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Wood



- Log cabin design with anything from 3x4 timbers, 4x4 timbers or 6x6 timbers for large structures, lined with EPDM



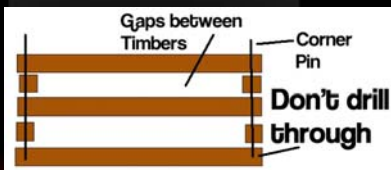
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Log Cabin Design



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Construction Point



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Block



- Cinder block or even landscaping pavers can be stacked and then the structure lined with EPDM rubber liner.



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Septic Tank HaVES



- Excellent tanks for retailing fish.
- Line the tank with rubber, polyurea, liner.
- Hecht, Herco
- Temperature stabilizing
- Indestructible



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in ground

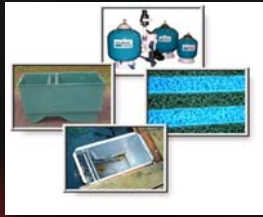


- Dig a hole and line it.
- Harder for consumer to pick fish.
- Harder to catch fish.
- More stable temperatures
- Less of a catastrophe if it leaks.



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Filtration



- Required to keep water mechanically and biologically clean and healthy
- Will have to carry large loads.
- High surface area required.
- High aerobic capability



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Central?



- Makes water quality easier to maintain.
- Spreads disease, though.
- Failure of one pump or plumbing set can kill the whole gang.



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Separate?



- Prevents spread of disease.
- Causes intensive management requirements of each different system



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BEST OF BOTH

- Fish retail tanks in a row
- Independent filtration on all of them. Heat the air and it will heat the water, with less condensation.
- Common drip line "in"
- Common drain line "out"
- No more water changes per se, if there's a bottom drain in the tanks, the one drain line being opened will clear off all the tanks' bottoms



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year round?



- Hard tanks can stay up and sell fish all year round if the customers want them.
- You can sell fancy goldfish from warmed tanks in winter.
- Sell other specialty fish for tanks in winter.



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Temporary?



- You will sell fish all spring and summer. Not in winter.
- Soft tanks can be taken down when the season is over.



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your power reliability



- If power fails in a heated system in winter – it's over.
- If power fails to a hot system in summer, it's over.
- Two circuits, moving water two ways, e.g. stone and a pump?



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Temperature risks

- Warm water = Less Oxygen with higher demand
- Consider: Power outage in summer
- Cold water = More Oxygen, almost no demand, low immune system
- Consider: How wintertime affects your livestock, come Spring.



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Fish management



- Gross exam DAILY
- Water should be crystal clear
- Fish examined on receipt for parasites and bacterial signs
- Tanks covered
- Records kept



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Feeding



- Feed once per day
MAXIMUM
- Feed 3x weekly for
best results
- More if you're doing
flow-through
- Let people pay for
your food?
- Fish meal as first
ingredient



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Handling



- Never carry a fish
in the net
- Smaller fish
especially piled in
a net will have
broken backs
- Non weight
bearing skeleton



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Covering



- Fish are jumpers
- Expensive fish are
more likely to jump
- Nets should be
fine mesh
- Easy to remove to
sell fish
- Covered at ALL
times



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Crowding

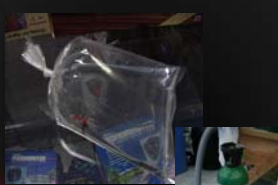


- Psychological
- Physical
- Environmental
- New water corrects environmental
- Hiding places and riprap can fix psychological
- The physical effects are a necessary evil.
- 1":10g

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Sending Home



- Catch gracefully
- Carry in bowl
- Pack in bag under pure oxygen
- Send care sheet
- Quarantine page
- Have a waiver
- O₂ comes from welding supply

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Their Quarantine


- 14 days – 21 days
- Salt 0.3%
- Praziquantel
- Dimilin
- Medicated food
- 74° F
- This is substantially the same as your quarantine except you would preview with a microscope and be readier to heat to 86

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water quality




- You can measure like, eighteen things all day long but there are three "things" you really need to monitor
- Nitrogen
- Temperature
- pH

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nitrogen



- Ammonia from the fish gill and kidney, decay of proteins in pond, etc.
- Ammonia becomes nitrite in the pond
- Nitrite becomes nitrate in the pond
- Nitrate used by algae or plants.



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pH

- A simple measurement
- Over eight is good
- Can fall precipitously
- Alkalinity supports it.
- Alkalinity comes from Baking Soda or other buffers which last longer.
- What brings down pH?

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Chlorine / Dechlor

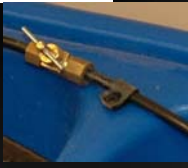


- Water changes bring in new municipal water which can contain Chlorine and Chloramine.
- Must be neutralized.
- Difference between Chlorine and Chloramine and why it matters – or doesn't.



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new water 4 your fish



- New water “fixes” the physiological and environmental effects of crowding.
- Run new water as often as you can!
- Drip systems with overflow to be extolled.



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parasite diagnosis



- Assume all fish have parasites
- Treat them empirically or diagnose them on receipt.
- Diagnose them before sending them home with consumers.
- This looks very good.



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parasite control

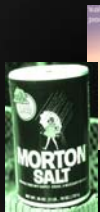


- Treatments can be specific to what the fish have.
- Salt for ciliates
- Formalin for Costia
- Supaverm for Flukes
- Dimilin for Anchor worms and fish lice.
- Or shotgunned.



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shotgun remedy That works



- Salt
- Temps to 74° F
- Dimilin / EcoRx®
- Medicated food
- Parasite Control with praziquantel!



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Bacterial infections



Bacterial Infection



- Bacteria do not cause bacterial infections.
 - Chilling, starvation, crowding, handling, stress and strain do.
- Medicated food, warm water, Tricide Neo or injections.



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Medicated Food



- There are several and you can mix and match for more coverage.
- Sinking pellets are better.
- Starve fish 24 hours. Put plastic on pond bottom and put sinking pellets on that
- Top-dress foods are just sad.

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injections



- Azactam, Chloramphenicol Baytril and Amikacin are popular and effective.
- Cost effective?
- Getting meds.
- Technique?
- Why inject all fish?

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ip injection



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pondrx.com
Injection IP




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Injection

- Intra peritoneal injection
- Puts meds around organs
- Good absorption from organ and belly lining (peritoneum)
- Safe!

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im injection



- For fish that are gravid, open, or there's a fear of injecting an internal organ
- Meat of back or under tail.
- Not my favored method.

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what to inject



- Azactam is the best
- Baytril is second best
- Chloramphenicol is third best
- Amikacin is fourth best
- There are many others. Described in KHD 2006 Reload

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dips or sprays



- Tricide Neo is the best.
- Tris EDTA dip can be mixed up and sprayed on.
- Very small fish, sprayed in net.
- Large fish in plastic bags and drenched for 2-3 minutes in bags

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Viruses



- Viruses are very very small and rely on the cell resources of other animals to live.
- There are several viruses of Koi, dermal, systemic. Some serious.

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S.V.C. important?

- I don't think so, but there are some things you should know, anyway.
- Testing **positive** spells the end of your business. Bye bye! Don't allow testing!
- It's reportable to the Fed.
- Looks like a bacterial infection because it is compounded by bacterial infection. (Ward et al)
- Kills 10% of a group of fish each year.
- It seems trivial, in most producers' operations.



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Koi Herpes Virus



- Not reportable
- Kills 90% of affected fish
- Operates in a narrow temperature range
Hibernates in cold water and fish.
Activates at 70-72° F
The virus dies at 84°F

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appearance



- Head down tail up swimming
- Fearlessness
- Peeling skin and fins
- Death avalanches between day 10-14 post infection.
- More gradual losses in cold water.
- History of new fish.
- Control is via lengthy quarantine in suitable temperature

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control



- Heating fish, one degree per hour until raised to 84-86°F
 - Hold at that temp for 4-7 days.
- Do not empirically heat. Why not?
- Carriers after heating? Probably not.
- < 4% of fish were carriers who survived the KHV naturally.

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prevention by quarantine



- When you get fish, establish the temp. of the source water.
- Buying fish out of New Mexico in summer is pretty safe, see?
- Hold at your shop for 14 days at least, at 74°F
- Inform the owner to quarantine, give handouts.

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Receiving Technique

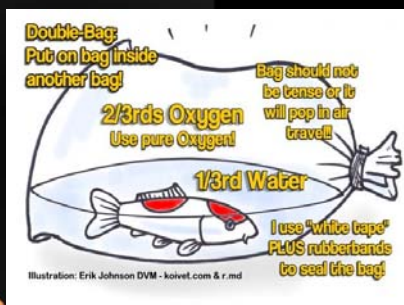
- Incoming fish are burning in the bag with parasites and caustics
- Remove at the airport to fresh water and pure oxygen for a few hours.
- Store overnight in Tank A - in fresh water, high aeration.
- Remove from A - to bags with pure oxygen, Formalin 50ppm for 120 minutes
- Move out to Tank B – and start the salt, medicated food, Dimilin, Prazi quarantine procedure.



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Bagging



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Selling Fish Well



- Signage for fish types, pricing.
- People are shy and often won't ask.
- Education through proper questions of owners pond and expectations.
- Don't let customers see dead and dying fish. Your pulls are crucial.
- Proper work area for packing out fish
- Pure oxygen.
- Handling fish correctly.
- Knowing answers.



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The Fish Sale Waiver



- All staff should be able to summarize your policy.
- Staff should be prepared to educate on quarantine.
- Indicate the waiver posted on a wall in a prominent place.
- Do not present it antagonistically. "It's the usual."
- No one signs it. It's a EULA!



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"your new Fish"



- Take it home now
- Carry in a dark box or paper sack
- Acclimate for 20-30 minutes
- Remove fish from bag and place in tank, do NOT dump bag water in your quarantine.



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a microscope: everyone wins




- If you had a scope you'd seem smarter
- You could check your own fish and stop guessing
- You could screen for-sale fish and spare yourself later trouble and complaints




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HOW YOUR CUSTOMER WINS





- They buy fish that AT LEAST do not come home with any parasitic incubus.
- They can recognize your expertise compared to the shop without diagnostics.




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HOW YOU WIN

- You look good to the customer
- You're armed with information on your end, and on their behalf
- You can confirm things to your vendors and your customers.




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Vet Practice?


- **Veterinary practice:** Rendering a diagnosis and / or making a prescription.
- You may, like a fisheries biologist, describe existing conditions.
- There were Chilodonella on the fish (Observation)
- Chilodonellosis (Diagnosis)
- There are sores on the fish. (Observation)
- Bacterial furunculosis (Diagnosis)
- Offer suggestions from inventory without directing someone.




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services waiver



- No waiver is bulletproof
- They can defray the **LIKELIHOOD** of a suit.
- They may offer some protection
- Have your legal counsel and insurer review this.




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Diagnostics For you



- Samples.koilab.com
- When you need more than a microscope can render
- Bacterial, Viral, Autopsy and Histopathology reports.
- How to prep and send samples
- Contacting the lab to make sure they're ready to receive the samples




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Bacterial Diagnostics

- A bacterial culture, taken from a live, but sick fish can tell you what is going on with a collection or group
- Documentation!
Samples.Koilab.com



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Viral Diagnostics



- The most important test that can be run on live fish prior to sale is KHV testing.
- Run on a rep from the batch
- Expose an SPF fish and test that fish.



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Parasite Diagnostics

- Sometimes you don't find a parasite but you're thinking it might be VERY small or second guess yourself.
- Send a live, cool fish to
- Samples.Koilab.com



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Under attack – Pond

- Sooner or later someone will attack your pond or someone else's pond as the cause of disease.
- Disease happens in Spring.
- Cause of death, and all alleged inhabitable conditions MUST be documented!
- Selling YOUR installation may result in a second suit, because Disease Still Happens In The Spring – even in your installation!



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Under attack – Fish



- They say your fish died, and their incubus killed their other fish.
- “Where is your documented diagnosis?”
- They will have to have proof.
- You could use a waiver on high-dollar sales.



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Mistake 1 – ‘Surrender’ Fish

- Stores that take surrender fish often take diseases with them.
- Mixing known and unknown quantities results in losses.
- Looks bad later to people who will think you are indiscriminate



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Mistake 2 – Treating Fish Onsite



- Having sick fish hospitalized on your lot is a **DISASTER** waiting to happen.
- If you go onsite and treat **THEIR** fish, don't bring back a fish, or a disease!



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Mistake 3 – no scope

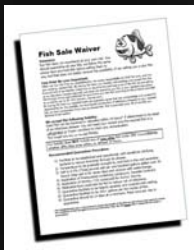


- Not having a scope paralyzes your ability to:
- Seek remedy with a vendor
- Rectify your own fish problems
- Defuse a consumer allegation



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Mistake 4 – no waiver

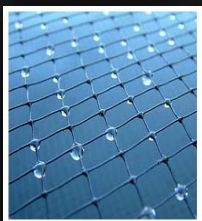


- Waivers are not bulletproof but they exhibit attention to detail
- They may blunt the case of a plaintiff
- They can educate.



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Mistake 5 – no cover



- Failure to cover fish costs retailers a LOT every year.
- Jumpers
- Exposure to toxins, light, heat and cold.
- Predators
- Kids



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Mistake 6 – Bad power



- Unreliable power or failure to back up the power can cause losses in:
Hot fish in summer
Heated fish in winter



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Mistake 7 – slack employees

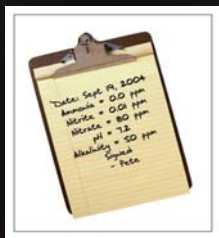


- Newbies shan't be intimidated by "Grunger" or "Goth" employees
Lack of knowledge alienates knowledgeable customers
Failure to pull dead or selling sick fish disgraces the business



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Mistake 8 – Late Detection



- Failure to notice early results in disease processes being very advanced and reduces the chances of reversing the disease while fish are still saleable



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Mistake 9 - Overfeeding

- Some businesses let kids feed the store fish from gumball machines.
- Some businesses overfeed their fish without the inflow of new water
- Over feeding causes: Waste accumulation, green water, bacterial blooms, **FISH THAT TRASH THEIR BAGS** on the way home.



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Mistake 10 - Crowding



- Crowding is necessary for profitability
- Poor water quality and psychological strain is **NOT**



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Wintertime and Koi

- In fall, leaves shan't be left in the pond!!
- Keep a hole open in the ice
- Stop bottom drains if present
- Waterfalls to be judiciously used due to supercooling
- Bacteria don't "die" they just stop working
- Don't disturb bottom layer of water
- Keep a hole open in the ice
- Place media in pond underwater and drain filters that might freeze.



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Why you need This Lab



- Here's your patient
- It might be yours
- It might be a valued customer
- You can observe parasites on such a fish, saving it.
- You can save this ulcerated fish with injections.
- You can open the fish if it dies and gather valuable information.



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Techniques for Fish Health

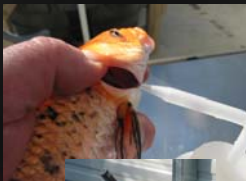
Erik L Johnson DVM



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introduction



- Intent: To teach and demonstrate most of the vital techniques for diagnosing and treating disease in Koi.
- I have been a fish keeper since 1973, I earned my DVM from UGA in 1991 and have treated fish professionally since 1993.



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TOPICS OF DISCUSSION



- Handling Fish
- Exam of fish
- Biopsy of fish
- Using a scope
- Injection of fish



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Handling



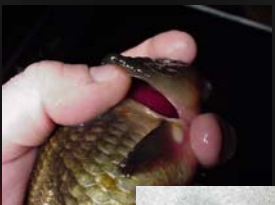
- Handling is a stressor.
- The body slime is home to the parasites.
- Do not touch the ventral surfaces of the fish to be biopsied.
- Never carry a fish in a net! Bowl it instead!



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exam of fish



- Body should be uniform and firm.
- Examine at the base of fins for parasites.
- Examine gills: Steak red!
- Slime coat should be uniform – 100%
- Record your findings with a pen or camera



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BIOPSY OF FISH

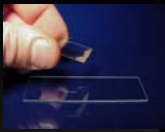


- Touch fish as little as possible
- Nets and hands remove slime coat – where parasites live!
- Scrape **aggressively**
- Cannot cut yourself with broken coverslip.
- Plastic coverslips are preferable!



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BODY SCRAPE



- Scrape on the bottom of the fish
- Scrape from head to tail
- Scrape from base of tail to tip of tail
- Put drop of water on slide.
- Longevity of slide prep!



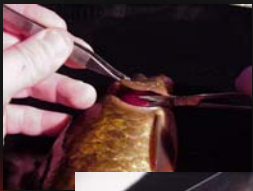
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scrapes movie – Tilt YOUR head



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Gill Snip



- Aggressive
- Fish can bleed
- Not usually necessary
- Take only the very tips
- Do not squash the prep under the coverslip



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Gill Scrape



- Fast and relatively easy
- Nominal bleeding
- More surface area from gill is biopsied
- No cutting – Less Liability



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- Now you've got your sample, what to do with it?
- In the next slides we'll talk about the microscope and some things you should know when sampling and using a microscope.



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The scope



- Moderate power
- Binocular is not necessary
- Start with lowest power
- Start with smallest ID aperture
- Make sure power is on
- Next: The oculars

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The oculars

Oculars



- They provide PART of the magnifying power of the microscope
- Make sure they aren't steamed
- One of the oculars is adjustable in binocular scopes.
- Next: The Optics

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The optics



- The **SMALLEST** one is the lowest power
- The longest one is the **highest** power
- Start with the **lowest** for survey
- Switch to higher powers for detail.
- Next: Adjustments

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The adjustment



Coarse
Adjust

- With most scopes there are two knobs
- Coarse adjust moves the optics up and down quickly.
- Fine adjust focuses the optics finely.
- Find these on your scope.
- Next: Choosing a scope



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BUYING A SCOPE



- Monocular is fine
- Glass optics are nicer
- Disc diaphragm is okay
- No fine adjust okay
- BUILT IN LIGHT SOURCE – no mirrors
- Up to 400X power good
- Next: The Iris Diaphragm



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The id aperture



- Not on "your" scope but you should know it anyway
- At left is an adjustable iris diaphragm
- Sometimes it's a disc with holes in it – choose the smallest for more contrast.
- Next: More diaphragms



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Light Reduction



- For contrast microscopy – smallest amount of light.
- But not all Iris diaphragms are the same.
- There are disc diaphragms and sliding shutters.



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These scopes

No Iris Diaphragm



- These scopes are LED lit
- They have a frosted glass filter and they are set to be used for light contrast
- They do not require an iris diaphragm



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Setting Up a scope - recap

- Turn it on
- Adjust the light to the lowest setting
- With many scopes you have to adjust the Iris Diaphragm to the lowest or smallest aperture to allow the least light.
- Adjust the scope to the smallest (lowest power) Optic Turret.
- Place sample slide on stage and Focus on the edge of the slide's coverslip.



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**The parasites
Under the scope**



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Costia



- Minuscule
- Needs 100-400 x power to see it
- Hard to show with pictures. Need to see movie.

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Costia 400x




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Flukes



- Cause Ulcer Disease and Flashing
- Hard to kill
- SupaVerm
- **PRAZI**
- OP's
- Why not dips?



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Fluke movie #1




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Fluke movie #2




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Fluke and Friend








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Chilodonella



- Springtime Killer
- Not very small
- Highly motile
- Heart or onion shaped
- Dies FAST in preps

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Chilodonella #2

- When dead: Goes "round"

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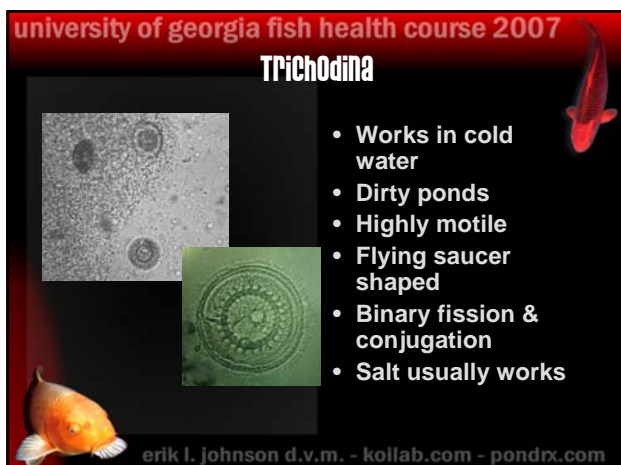
white spot 01.mpg

- This rarely causes "White Spot" in Koi even though the fish are dying of the parasite
- "Rolls in place"
- Salt it away
- Doesn't swim around.

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argulus



- Crustacean parasite
- Microscope is not necessary for diagnosis.
- Easily cleared with Dimilin.
- Harms fish for a week before grossly visible.

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argulus movies



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injection of fish



- In order to administer medications
- Sick fish might not eat
- Baths ineffective
- Injections are fast and fast-acting
- Simpler than you think
- When not to inject?

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materials



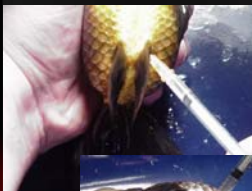
- One cc syringes usually okay
- Tuberculin Syringes easily available
- Flimsy needles
- Have to find **sweet spot**
- Air is okay!



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ip injection



- Safer, cosmetically
- Easier
- Faster acting
- **Sweet spot** is under ventral fin, in "the pit" even on huge fish.
- No resistance!



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ip injection movie



- Get a decent grip on the fish
- Insert the needle under the ventral fin
- Push the plunger
- Withdraw the needle
- Film by Steve Dutcher.



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im injection



- Can scar the fish
- Several sites
- Slower absorption
- Hurts the fish more, they struggle more.
- Blowback

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im injection



■ You will see the needle going into the meat of the back – note the angle of the needle

■ Also, I move further back and inject under the meat of the tail.

■ Film by Steve Dutcher

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Using The Syringe



- Push the cap on, **HARD**. This makes the needle stick on the syringe tightly.
- Then **pull** the cap straight off, without twisting.
- **Overfill the syringe and expel the excess !**
- **Sharps note**

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The Technique



- Invert bottle of injectable
- Draw up MORE than you need
- Expel excess back into bottle
- NEVER introduce a dirty needle into the bottle again
- You CAN use one needle on several fish in the same condition and collection.
- Never use a needle across collections.

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anesthesia



- Oil of Cloves
- IsoFlurane
- MS222 / Finquel
- Alka Seltzer
- Rubber hammer
- My biography

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OIL OF CLOVES



- Safest!!! **By far!**
- Gradual induction
- **Emulsify!**
- 5 drops per gallon Oil of Cloves
- Eugenol / 85% Toothache Remedy – 1-2 drops per gallon

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end of demo portion



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Let's get started!



- Make sure your station has:
- Scope
- Tray
- Needles/syringes
- Water for injection
- Glass slides
- Coverslips
- Box for fish




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now you should be...



- Orient yourself to your scope
- Figure out the lowest powered optic.
- Set the ocular the way you want it – see image at left.
- Focus the scope on a slide and coverslip
- Yell if you're having trouble.



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now you should be...



- Don't box any fish yet.
- Go on over to the tank and get a fish up. Handle it very little. Collect a skin scrape.
- Put a drop of water on the slide and look at the scrape with your scope.
- Do a gill scrape, look at that.
- Consider a gill snip.
- Yell if you're having any trouble



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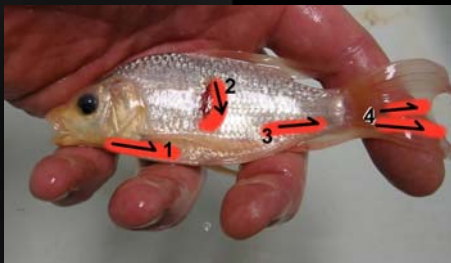


The scrapes



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if you find a critter



- Bring the slide to the projection table and we can put it on a screen for more people to see.
- Thank you



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now you should be...



- Go ahead and box a fish up for you and your table mate.
- MAKE SURE THE BOX HAS A COVER ON IT!
- DON'T FILL THE BOX UP
- Bring the fish to the table.
- Practice injecting IP now.



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now YOU should Be...



- Sometimes you have to inject IM because the abdomen is open or the female is gravid.
- Practice IM injection now please

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about those needles



- Needles don't belong "loose" in the trash.
- Sharps containers are best
- Water bottles can be substituted, double wrapped and discarded.
- Sharp objects can and should be placed in an empty water bottle and thrown away.

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Time to Clean Up!

- Ask any questions
- Throw away trash, paper towels
- Wipe / rinse out fish boxes and replace on lab table
- Put needles and sharps in water bottle or other container
- Wipe down your tray
- Wipe down instruments / scissors and leave for the next group.
- Close boxes of slips and slides
- Take your microscope and box it up.

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KOI RESOURCES

DOC JOHNSON CAN

VOUCH FOR

Domestic Koi Wholesale

(Doc's Favorite)

Randy LeFever, Rick Brown

800-334-5257

brfish1@bellsouth.net

Blue Ridge Fish Hatchery

336 788 6770

Cell 336 692 2421

4546 Kernersville Road

Kernersville NC 27284

Domestic Koi Wholesale

(Doc's Very Highly Recommended)

Joe and Cheryl Pawlak

Email - greatkoi@aol.com

Phone - 352/357-4563

Fax - 419/715-8697

Direct Line -352/217-5518

Domestic Koi Wholesale

(Doc's Got Less Experience With Them)

Kloubec Farm

319.846.2077 & 2055

1375 Baxter Ave NW

Amana Iowa 52203

Fax 319.846.8099

Fish Sales Inquiries to: koi@kloubec.com

Domestic Koi Wholesale

(Very, very nice proprietor)

North Prairie Koi Farm

Hwy 249, P.O. Box 481

Hazen, AK 72064

870-255-3672

Import Koi Wholesale

(Friend of Doc's)

Dan Vadney

E-Mail: packoi@juno.com

10151 42nd Ave. East

Tacoma, Washington 98446

Phone: (253) 537-1525

Import Koi Wholesale

(Friend of Doc's)

Mark Bodycott

mark@usakoi.com

Phone: 856-881-7088

Fax: 856-881-7089

463 Fish Pond Road

Glassboro, New Jersey 08028

Import Koi Wholesale

(Friend of Doc's)

Carl Forss

KEIRIN KOI

4580 Crackersport

Road, Allentown, PA 18104

1-888-4-KEIRIN

(610) 395-2572

Fax (610) 395-0535

Import Koi Wholesale

(Friend of Doc's)

Ken Tran

14700 Goldenwest Street

Westminster, CA 92683

(714) 890-1989 - phone

(714) 895-7958 - fax

Magnoy Israeli Koi Wholesale

You should try to make contact with

(Friend of Doc's)

Mordi Haimi

<http://www.magnoy.com/contact.htm>

Domestic Koi Wholesale

(Doc says: Upstanding, honorable man)

Brett Rowley

16654 Meadow Lane

Danbury TX 77534

Email: brett@brettsfishfarm.com

Phone: 979-922-1570

Cell: 281-685-6073

Database For any Koi Health Crisis – Erik Johnson D.V.M.

QUESTION QUALIFICATION		QUESTION QUALIFICATION	
History		Water Quality - Continued	
Client Experience?	Find out whether the client is experienced, or new to fish health.	Ammonia level?	Ammonia should be 0.0 Reduce feedings. Change water.
New fish lately?	New fish without quarantine bring fish diseases into collections	Nitrite level?	Nitrite should be 0.0 – Low-level nitrite is a serious problem.
Were the new fish quarantined?	Quarantine should be at least 14 days, better still: 30 days.	Nitrate level?	Nitrate should be < 80 ppm Nitrate is only chronically toxic.
Have the fish been transported lately?	Transported fish are immune threatened. Disease is more common.	PH Level?	PH should be 7.0 – 9.0 If it falls, raise it quickly!
Transported: Where and how?	Overseas shipment or transcontinental shipment can cause “bag burn”. Koi shows can transmit disease.	Alkalinity level?	Alkalinity should be 80-250 ppm and can be raised with oyster shell or baking soda.
Ornaments or rocks in pond?	Sharp rocks can and do cut fish. Gravel in pond is good unless left unmaintained for 24 –36 months depending on feeding rate.	Water Temperature?	< 55 = No food & Low immune function. 68-75 = Good temperature 80+ = Heat stress / Low O ₂
Use the reverse side or separate sheet to describe illness.	Description should be thorough, including fish behavior, duration, appearance, and especially, exam after death. Notice the gills in the dead!	Water temperature swing?	Owner should perform 8-hour interval daily temperature readings. > 20° per 24 hours is damaging.
Describe all treatment doses, interval & results.	Treatments done without water testing complicate the proper forensics of cases – Formalin tests like Ammonia.	Can you hear the pond?	It has been said that if you hear lots of surface agitation, there’s enough oxygen.
Number of fish in pond	No more than 1 inch per ten gallons of water without real fish expertise.	Pond Construction / Facilities Questions	
Polyculture?	Do they mix different species? Some can be aggressive!	Pond Construction?	Liner? Polyurea? Concrete? Mud?
Number of fish affected?		Describe Filtration	Type, size, flows? (Water should turnover every hour or two.)
Number lost so far?	If losses are > 50% think about Koi Herpes Virus or peracute water quality problem like pH crash.	Water circulation?	Circulation needs to be aggressive for Koi. Turnover should be 1x every 1-2 hours.
When did the illness show up?	KHV shows up 5-10 days after introduction of carrier fish.	Last filter overhaul?	Need to know manufacturer recommendations.
Total Inches of fish?	Crowding: > 1 inch per ten gallons	Last water change?	Some folks don’t do water changes.
What are the fish fed?	Should not be catfish food. Should be two good quality staples and treats.	How much was changed?	Up to 70% can be good especially in Spring and Fall.
How much are the fish fed?	Fish should be fed 1-2 x daily, all they want in five minutes with none left over. Good treats include grapefruit and silkworm pupae.	Normal water change regimen?	Should be 10% per week or 30% every 3 weeks. When water is close to tap temp, larger changes are possible.
Appetite recently?	Fish off feed are sick, or very, very cold! Fish that eat sparingly may be in warm water or with low O ₂	Is there a UV?	UV is “ultraviolet” clarifier to kill bacteria & algae. Will not kill parasites.
Sudden deaths?	Sudden death can suggest bacterial or viral conditions, or acute water quality issues. Examine gills!!!	Was UV off during attempted treatments?	UV can destroy Formalin, furans, and some other medications.
Dropsy? Sunken eyes?	Dropsy is an incurable infection of the kidney. Sunken eyes come with bacterial infections and KHV.	Carbon in filter?	Carbon can bind medications and soften water. Carbon removes tannins and other impurities.
Is there debris on the pond bottom, or HAS there been?	Common! Winter leaf debris is carried over into Spring and disease organisms love the leaf litter and debris.	Plants in system?	They may be harmed by salt. Their soil can elaborate noxious gases if not maintained annually.
Water Quality Questions		Pump location	Submerged: Stray voltage? Centrifugal: Better efficiency
Water source?	Well, tap, Chlorine-treated? Chloramine-treated? Must know!	System Size	[L” x W” x D”] ÷ 231 = US Gallons
Does pond receive runoff?	Rainwater runoff from roof contains creosote, etc. Runoff from grass contains nitrates and insecticides.	Amount of sun per day	Full sun? Filtered sunlight? Shade? More sun is better, but grows a lot of algae.
Is the water cloudy?	Cloudy water precipitates gill disease and other stress-related conditions. The source can be bacteria or minerals	Algae in system	Algae dusting is good String algae = overfeeding. Green water is not so good.
Diagnostic Lab Services: http://samples.koilab.com			
Special: Wood deck around pond?	Toxic woods include pressure treated and cedar	Special: Hydrogen sulfide testing	Hach.com sells H ₂ S kits.

Disease Transmission By Type and Vector

	Bird Water	Bird Waste	Water with plants	Airborne	New Fish	Water / Splash	Used Ornaments
VIRUSES* ¹	Rare to no	No	Rare but yes	No	Yes	Rare but yes	Rare but yes
BACTERIA* ²	Rare to no	No	Rare but yes	No	Yes	Rare but yes	Rare but yes
PROTOZOANS	Rare but yes	No	Yes	No	Yes	Rare but yes	Rare but yes
CRUSTACEANS (Anchor worm / Fish Lice)	Rare but yes	No	Yes	No	Yes		Rare but yes
Flukes (Monogenea)	Rare but yes	No	Yes	No	Yes	Rare but yes	Rare but yes
Algae	Rare but yes	No	Yes	Yes		Yes	Yes
Fungi	Rare but yes	No	Yes	Yes	Yes	Yes	Yes

*¹ Viruses of pathogenic nature to ornamental Koi

*² Bacteria of pathogenic nature to ornamental Koi

Fish Health Waiver Sample

I hereby acknowledge that I have voluntarily chosen to use the facilities of, accept the assistance of, and patronize the business of _____ (hereinafter called "Aquatics Vendor").

I am transacting with "Aquatic Vendor" of my own free will and without enticement. No representation has been made as to the qualifications or authority of Aquatics Vendor to advise or assist me with my ornamental fish. No advice or recommendation rendered by Aquatics Vendor is intended to, or shall be construed to replace the advice or assistance of a licensed veterinary practitioner or fisheries biologist.

I understand the risks involved in the relationship concerning my aquatic livestock. I agree to accept any and all risks associated with it, including but not limited to aquatic livestock property damage or loss, minor bodily injury, severe bodily injury, and the death of livestock or injury to myself. Furthermore, I recognize that participation in the program involves activities and risks incidental thereto, including but not limited to, travel to and from facilities, and the possible reckless conduct of other participants. I am voluntarily participating in the program with the knowledge of the risks involved and hereby agree to accept any and all inherent risks of property damage, bodily injury, or death.

In consideration of my participation in the program and to the fullest extent permitted by law, I agree to indemnify, defend and hold harmless "Aquatics Vendor", its officers, directors, employees, agents, volunteers and assigns from and against all claims arising out of or resulting from our relationship regarding my aquatic livestock. "Claim" as used in this agreement means any financial loss, claim, suit, action, damage, or expense, including but not limited to attorney's fees, attributable to bodily injury to aquatic livestock, sickness, disease or death, or injury to or destruction of tangible property including loss of use or contraction of endemic or zoonotic infectious disease resulting there from. In addition, I hereby voluntarily hold harmless "Aquatics Vendor", its officers, directors, employees, agents, volunteers and assigns from any and all claims, both present and future, that may be made by me, my family, estate, heirs or assigns.

I also understand that "Aquatics Vendor" does not provide any liability insurance to cover bodily injury, illness or death for the undersigned aquatic livestock, nor insurance for personal property damage or loss, nor insurance for liability arising out of any negligent acts or omissions; and I acknowledge that I am completely responsible for my own insurance or financial liability for same.

I further understand that this acknowledgment of risk and hold harmless is intended to be as broad and inclusive as permitted by the laws of the State of _____ and that if any portion hereof is held invalid, I agree that the balance shall, notwithstanding, continue in full legal force and effect.

I agree that this acknowledgment of risk and hold harmless is effective for as long as I have a relationship with "Aquatics Vendor" concerning any and all aquatic livestock of consequence or ownership by the undersigned.

Initial that you understand and accept all of the following and sign below:

____ No advice or recommendation rendered by Aquatics Vendor is intended to, or shall be construed to replace the advice or assistance of a licensed veterinary practitioner or fisheries biologist.

____ "Aquatics Vendor" will not render any diagnosis of my aquatic livestock nor assumes any responsibility for the detection or failure to detect any condition or disease.

____ "Aquatics Vendor" will neither prescribe any treatment for nor administer any treatment of my aquatic livestock nor does ____ "Aquatics Vendor" assume any responsibility for the successful or unsuccessful outcome of any remedy obtained from "Aquatics Vendor" to ameliorate, correct or relieve any condition or disease.

____ The limit of liability for "Aquatics Vendor" is expressly limited to the compensated value of any aquatic livestock under consideration as verified by invoice or receipt provided by "Aquatics Vendor" or the undersigned at the time of its purchase from "Aquatics Vendor"

____ "Aquatics Vendor" assumes no liability whatsoever for the transmission of infectious diseases under any circumstances to my aquatic livestock via the sale by "Aquatics Vendor" of infected livestock, or contact with same here, or on my property directly or via quarantine.

____ Any claims made by the undersigned for remuneration of any perceived or real losses of aquatic livestock sold by "Aquatics Vendor" or aquatic livestock exposed to same will be accompanied by valid diagnostic laboratory information to verify the exact cause of death of affected specimens. In the absence of such documentation, I understand that any action, complaint, or claim for remuneration, compensation or settlement of any kind will be legally and functionally null and void.

____ It is my express intent that this Release and Hold Harmless Agreement shall bind the members of my family and spouse (if any), if I am alive, and my heirs, assigns and personal representative, if I am not alive, shall be deemed as a RELEASE, WAIVER, DISCHARGE AND COVENANT NOT TO SUE the above named "Aquatics Vendor" - I hereby further agree that this Waiver of Liability and Hold Harmless Agreement shall be construed in accordance with the laws of the State of _____

IN SIGNING THIS RELEASE, I ACKNOWLEDGE AND REPRESENT THAT I have read the foregoing Waiver of Liability and Hold Harmless Agreement, understand it and sign it voluntarily as my own free act and deed; no oral representations, statements or inducements, apart from the foregoing written agreement, have been made; I am at least eighteen (18) years of age and fully competent; and I execute this Release for full, adequate and complete consideration fully intending to be bound by same.

IN WITNESS WHEREOF, I have hereunto set my hand on this _____ day of

_____, 200__.

Undersigned

Parent must sign if under 18 years old

This fish health waiver does not replace or represent the advice of qualified, licensed legal counsel. Your legal counsel and your insurer should review any documents representing you or your business. This form was written by Dr. Erik Johnson DVM of koivet.com and is not a legal document. Copyright or other trademark law does NOT protect this document. If your counsel finds this document useful "as is" or amended, simply obscure "Sample" in the leader line and remove this short paragraph/disclaimer for photocopying and use by your organization.

Fish Sale Waiver



Summary:

Buy fish here, (or anywhere) at your own risk. You should quarantine all new fish, we follow the same advice here and hold fish before selling them to you, but that does not totally remove the possibility of our selling you a sick fish.

Fine Print No Less Important:

When you buy fish from our establishment, we accept responsibility for OUR fish only, and not your existing, resident fish. By buying fish here, you thereby acknowledge and accept that the financial limit of our liability is less than or equal to the purchase price of the fish we are selling at our discretion (receipt required) and does not extend to any fish in your resident population. We strongly encourage customers to quarantine any new fish according to the protocol provided to us and to you by Dr. Erik Johnson. (koivet.com)

By buying fish from our establishment you expressly agree that you acknowledge and accept full responsibility for the possible, but improbable introduction of infectious diseases to your resident fish via their transmission from new purchased fish. Fish is provided as-is. All of our fish are believed to be healthy

We accept the following liability:

Dead fish can be replaced or refunded within 24 hours* if determined to be dead of an infectious disease. You will need your receipt plus the expired fish in a refrigerated or frozen condition to claim any remuneration.

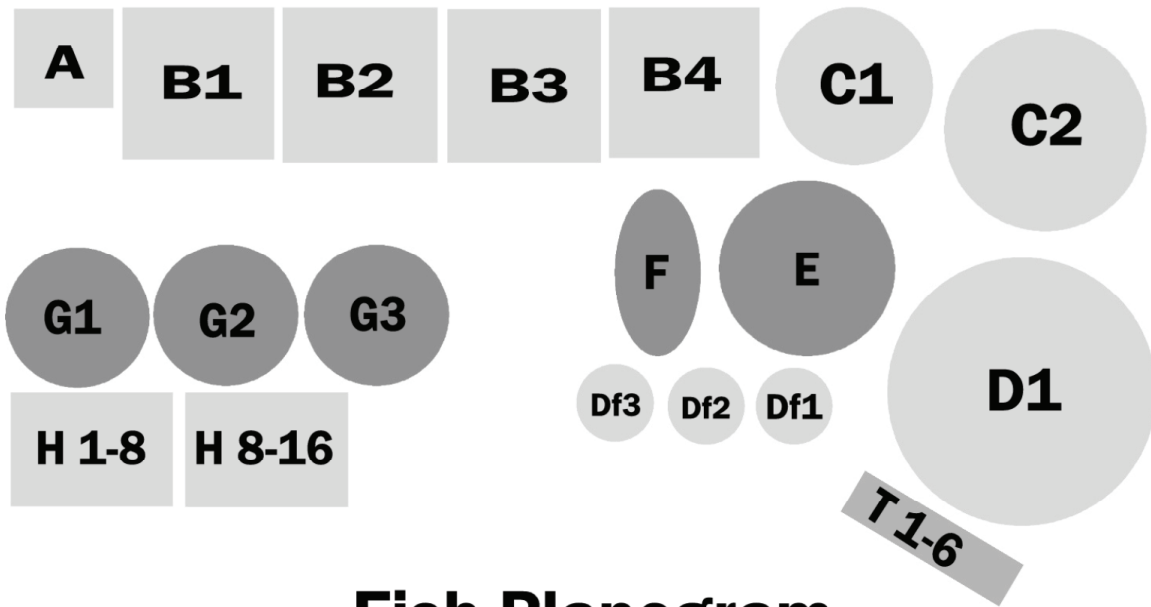
*Fish bought Saturday can be seen Monday.

Our liability does **NOT** include any of your other fish under ANY circumstances, whether difficulties arise within, or without 24 hours.

Recommended Quarantine Procedure:

- 1) Facilities to be established and operational, with beneficial nitrifying bacteria to reduce Ammonia through its phases.
- 2) Temperature to be gradually brought to, and held in the mid seventies.
- 3) Salt to 0.3% (Three pounds salt per one hundred gallons added over 36 hours) Keep salt in for seven days and remove with waterchange.
- 4) Application of Praziquantel-containing compound, Parasite Control®
- 5) Application of Dimilin / CSI compound for Anchor Worms
- 6) Medicated food could also be fed to reduce risk of infections.
- 7) Quarantine facilities to be heavily aerated, and covered with netting.
- 8) Quarantine facilities to be 100+ gallons per ten inches of fish.
- 9) Quarantine should be 14 days at a minimum. Feed once per day in quarantine.

Our establishment uses a microscope to ensure the health of the fish we sell and we may agree to assess the conditions of fish brought to us at our discretion only. We will never offer a diagnosis nor make a prescription.



Fish Planogram



TANK	Amm	Nitrite	Nitrate	PH	Notes
A					
B1					
B2					
B3					
B4					
C1					
C2					
D1					
Df1					
Df2					

This is a sample planogram of KoiLab.com – there would be columns and rows for every tank in the lab but that takes a second sheet, which is wasteful for the purposes of this document. This document is useful for when you do a walk through and have specific instructions for your manager, for example; as I often do:

**“Move all fish from G1 into D1 and drain G1. Refill G1 and let G1 run for one day.” Or
System “J” need a filter backwash and fifty percent water change.
Treat System B with Proform C® every day for 5 days. Then do a water change.**

Koivet.com – Dr. Erik Johnson DVM – Freely useable, non-copyrighted.

Koi Husbandry Record

Staff Member:			
Date			
Fish Count			
Dead Pull			
Water Clarity			
<input type="checkbox"/> Crystal	<input type="checkbox"/> Clear	<input type="checkbox"/> Haze	<input type="checkbox"/> Cloudy
<input type="checkbox"/> Green	<input type="checkbox"/> Fetid look	<input type="checkbox"/> Fetid smell	<input type="checkbox"/> Other
Correction:			
Water Movement			
<input type="checkbox"/> Brisk	<input type="checkbox"/> Normal	<input type="checkbox"/> Slowing	<input type="checkbox"/> Low / off
Correction:			
Filter Condition:			
<input type="checkbox"/> New	<input type="checkbox"/> Clean	<input type="checkbox"/> Normal	<input type="checkbox"/> Dirty
Action:			
Water Testing <input type="checkbox"/> Not done			
Ammonia		Nitrate	
PH		Water Level	
Nitrite		<input type="checkbox"/> Good	<input type="checkbox"/> Low
Correction:			
Fish Condition			
<input type="checkbox"/> Active	<input type="checkbox"/> Hungry	<input type="checkbox"/> No Lesion	<input type="checkbox"/> Lesions
Lesions Noted:			
Duration:			
Correction:			
Feeding	<input type="checkbox"/> AM	<input type="checkbox"/> Midday	<input type="checkbox"/> Evening
<input type="checkbox"/> No food	<input type="checkbox"/> Ate well		
NOTES:			

Veterinary Practice Statement

The best, most specific definition of the practice of Veterinary Medicine, without a license comes from Texas state law: "The Veterinary Licensing Act defines the practice of veterinary medicine as the diagnosis, treatment, correction, change, manipulation, relief or prevention of animal disease, deformity, defect, injury, or other physical condition, including the prescription or administration of a drug, biologic, anesthetic, apparatus, or other therapeutic or diagnostic substance or technique; representation of an ability and willingness to perform the acts listed above; or use titles, words, or letters to induce the belief that a person is legally authorized and qualified to perform an act listed above; or the receipt of compensation for performing an act listed above."

Any fish retailer without a DVM who accepts money to identify or diagnose ANY medical condition may be a criminal who can be arrested. Those without a DVM license may not claim to be a "practitioner"

"In Colorado and most other states, a person cannot call themselves a "therapist" "doctor" or "practitioner" or say they do "therapy" on animals unless they are a veterinarian. Otherwise, they can be accused of practicing veterinary medicine without a license."

Practicing Veterinary Medicine

Practicing veterinary medicine without a license is a crime in the USA and a felony in some states. While each statute is different, most all prohibit the diagnosis and treatment of any animal without a valid State license.

There are several issues relating to the dangers of fish dealers performing as veterinary medical advisors:

- **Dealers performing medical acts and losing hobbyists' fish**
- **Your competition reporting your actions to the Board as criminal activities**

In the more odd cases, even recommending doing **nothing** can cause harm, or loss. Inept laymen may recommend withholding medical treatment or recommend having a Koi euthanized, claiming that the Koi is not worth treating with, or would not survive a life-saving procedure or treatment.

Not Charging, Is It Still The Practice of Veterinary Medicine?

According to this Hawaii statute, accepting money to diagnose illness is a crime punishable by up to six months in prison.

North Carolina law

In North Carolina, you must have a license to practice Veterinary Medicine to perform de-worming or vaccinations, even if you do not charge a fee.

New Hampshire law

According to the New Hampshire Veterinary Practices Act, anyone violating the status is liable for \$2,000.00 per violation.

California expands their statute to include any laymen whose activities may cause harm to an animal. According to the California Veterinary Medical Board: "Anyone who witnesses or believes that a licensed veterinarian or unlicensed person's behavior or activities may cause harm (or the potential for harm) to animal patients or may be illegal, can file a complaint."

Doc's Thoughts (Do not substitute for the paid opinion of a trained, licensed legal counselor)

First: Know your customer and make sure you also totally trust your customer. Still, get a waiver.

Second: Never advertise your "services" or assistance. Perhaps use your capabilities but do not offer, up sell, or aggrandize these skills.

Third: Seriously **reconsider** ever charging anything **directly** for any assessment or advice regarding fish health.

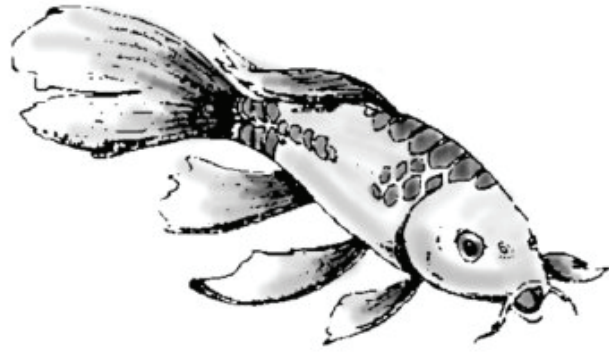
Fourth: Your opinion may include that you are safe if you merely assess a condition, but never offer a written or formal "diagnosis". Observing the simple "condition" that a dog has fleas on its body is one thing, while diagnosing that ectoparasitism is the root of the problem is another.

Fifth: You should never prescribe nor render a treatment for someone's fish. You may indicate a shelf containing the commonly used medications in your store for a particular condition but I'd avoid actually dosing or doing a treatment.

If their fish die – or if you're being stung by a regulatory agency, how close can anyone come to saying "They represented that they were qualified to diagnose and treat my fish, I paid them, and the outcome was unpalatable." - If anything like that can be said, you will probably pay.

YOUR NEW FISH

Successful purchase of fish means picking good fish in the first place, from a careful and conscientious vendor, and whisking them home quickly to a comfortable quarantine facility. Smooth introduction of your new fish into a good quarantine to stay for a little while is the best way to ensure successful fish keeping. **Let's do this step by step.**



1. Good vendors usually present the fish in clear plastic bags with a very mild sedative and pure oxygen (that's not "air" in the bag)
2. Take the fish home, and if possible – on the ride, keep your new fishes' bag in a darkened box or paper sack (it calms them) Avoid letting your new fish get too warm or too cold. Try and minimize sloshing.
3. Float the fish (in its bag), in your prepared quarantine tank. See that the water in your quarantine tank is about the same (within ten degrees Fahrenheit) of the water that your fish was purchased out of.
4. Assuming the fish are acting calm and remain comfortably upright, after 20-30 minutes, simply open the bag and remove the fish from the bag using wet hands or a net, placing them in the holding tank. Do NOT pour that bag water (which contains concentrated toxins, gases and bacteria) into the holding tank, you should, instead, dump it away.
5. Watch the fish for any signs of trouble. If they swim about normally, cover the tank and begin the following quarantine advice. If they seem severely stressed, test your water for Ammonia, which should be zero, and pH, which should be higher than seven.

Recommended Quarantine Procedure:

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- 2) Temperature to be gradually brought to, and held in the mid seventies.
- 3) Salt to 0.3% (Three pounds salt per one hundred gallons added over 36 hours) Keep salt in for seven days and remove with water change.
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- 9) Quarantine should be 14 days at a minimum. Feed once per day in quarantine.

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Koi: Gross and Microscopic Assessment Form

Freely distributed – by Dr. Erik Johnson, DVM – koivet.com & pondrx.com

Assessment for: _____ ☐ In-house
Examiner: _____ ☐ Not Applicable

Historical Notes

- | | | |
|---|--|---|
| <input type="checkbox"/> Number affected | <input type="checkbox"/> Pond Volume | <input type="checkbox"/> Alkalinity |
| <input type="checkbox"/> Number dead | <input type="checkbox"/> Pond Temp | <input type="checkbox"/> Water Clarity |
| <input type="checkbox"/> New fish lately? | <input type="checkbox"/> Ammonia Level | <input type="checkbox"/> Total Inches Fish (1" per 10g) |
| <input type="checkbox"/> When? | <input type="checkbox"/> Nitrite Level | <input type="checkbox"/> |
| <input type="checkbox"/> Quarantined? | <input type="checkbox"/> pH Level | <input type="checkbox"/> |

Gross Examination

- | | | |
|---|---|---|
| <input type="checkbox"/> Eyes <input type="checkbox"/> Norm. <input type="checkbox"/> Bulging | <input type="checkbox"/> Fins | <input type="checkbox"/> Body Bulges <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <input type="checkbox"/> White Pupils <input type="checkbox"/> Damaged | <input type="checkbox"/> Describe | <input type="checkbox"/> Describe |
| <input type="checkbox"/> Mouth <input type="checkbox"/> Normal <input type="checkbox"/> Open <input type="checkbox"/> | <input type="checkbox"/> Body Shape | <input type="checkbox"/> Body Sores <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Rotten <input type="checkbox"/> Damaged | <input type="checkbox"/> Describe | <input type="checkbox"/> Describe |
| <input type="checkbox"/> Gills <input type="checkbox"/> Red <input type="checkbox"/> Pale | <input type="checkbox"/> Body Mass <input type="checkbox"/> Normal | <input type="checkbox"/> Redness <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <input type="checkbox"/> Rotten <input type="checkbox"/> Green <input type="checkbox"/> Slimy | <input type="checkbox"/> Lean <input type="checkbox"/> Skeletal | <input type="checkbox"/> Describe |
| <input type="checkbox"/> Mucus <input type="checkbox"/> Excess <input type="checkbox"/> Scant | <input type="checkbox"/> Tail <input type="checkbox"/> Complete | <input type="checkbox"/> Argulus |
| <input type="checkbox"/> Normal <input type="checkbox"/> Patches | <input type="checkbox"/> Red <input type="checkbox"/> Rotten <input type="checkbox"/> Split | |
| <input type="checkbox"/> Lerna | <input type="checkbox"/> Ergasilus | <input type="checkbox"/> |

Body Scrapes

- | | | |
|---|--------------------------------------|--|
| <input type="checkbox"/> Flukes / Trematodes | <input type="checkbox"/> Ich | <input type="checkbox"/> Chilodonella |
| <input type="checkbox"/> Costia / Ichthyobodo | <input type="checkbox"/> Trichodina | <input type="checkbox"/> Ambiphraya |
| <input type="checkbox"/> Tetrahymena | <input type="checkbox"/> Glossatella | <input type="checkbox"/> Hexamita |
| <input type="checkbox"/> Epistylis | <input type="checkbox"/> Scyphidia | <input type="checkbox"/> Trichophrya |
| <input type="checkbox"/> Pollen | <input type="checkbox"/> Algae | <input type="checkbox"/> Fungi / Saprolegnia |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Gill Biopsy / Scrapes

- | | | |
|---|--------------------------------------|--|
| <input type="checkbox"/> Flukes / Trematodes | <input type="checkbox"/> Ich | <input type="checkbox"/> Chilodonella |
| <input type="checkbox"/> Costia / Ichthyobodo | <input type="checkbox"/> Trichodina | <input type="checkbox"/> Ambiphraya |
| <input type="checkbox"/> Tetrahymena | <input type="checkbox"/> Glossatella | <input type="checkbox"/> Hexamita |
| <input type="checkbox"/> Epistylis | <input type="checkbox"/> Scyphidia | <input type="checkbox"/> Trichophrya |
| <input type="checkbox"/> Pollen | <input type="checkbox"/> Algae | <input type="checkbox"/> Fungi / Saprolegnia |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Samples Collected / Sent

- | | | |
|---|---|---|
| <input type="checkbox"/> Liver <input type="checkbox"/> Tissue <input type="checkbox"/> Swab | <input type="checkbox"/> Kidney <input type="checkbox"/> Tissue <input type="checkbox"/> Swab | <input type="checkbox"/> Spleen <input type="checkbox"/> Tissue <input type="checkbox"/> Swab |
| <input type="checkbox"/> Intestine <input type="checkbox"/> Tissue <input type="checkbox"/> Swab | <input type="checkbox"/> Gonad <input type="checkbox"/> Tissue <input type="checkbox"/> Swab | <input type="checkbox"/> Air sac wall <input type="checkbox"/> Tissue <input type="checkbox"/> Swab |
| <input type="checkbox"/> Heart <input type="checkbox"/> Tissue <input type="checkbox"/> Swab | <input type="checkbox"/> Blood <input type="checkbox"/> Sample <input type="checkbox"/> Swab | <input type="checkbox"/> Gall Bladder <input type="checkbox"/> Tissue <input type="checkbox"/> Swab |
| <input type="checkbox"/> Peritoneum <input type="checkbox"/> Tissue <input type="checkbox"/> Swab | <input type="checkbox"/> | <input type="checkbox"/> |

Send to: Samples.koilab.com

PCR – Swab test of dying fish for Koi Herpes Virus – Collect on sterile swab from organ or blood and freeze and ship overnight.

In Situ Hybridization – Finds virus in cells of infected fish. 10% buffered formalin fixed tissues sent to samples.koilab.com

KHV Agglutination Test – Frozen blood samples in red top tubes from live fish, shows antibodies to KHV

Culture and Sensitivity – Bacterial culture and what they're sensitive to, sent on swab overnight on ice, but dry. Collected from an internal organ from sacrificed fish or aseptically collected blood from live fish.

Histopathology – Sample of tumor or organ put in 10% buffered formalin and sent with descriptive to samples.koilab.com

Use of this form expressly implies that any user of this form acknowledges and accepts that this form is not intended to render a "diagnosis" nor does it replace the advice or services of a licensed veterinarian who treats ornamental fish. In fact, the document is a guide to allow the hobbyist to collect thorough details and data of value to the practitioner if such a professional should be consulted in the above case. No prescription can be made based on the above data.

Freely distributed – by Dr. Erik Johnson, DVM – koivet.com & pondrx.com

Seminar Evaluation

Instructor: **Dr. Erik Johnson**

Course / Seminar

With 0 being unacceptable and 10 being perfect, please rate the following:

This seminar was interesting:

Worst 0 1 2 3 4 5 6 7 8 9 10 Best

Presenter was knowledgeable

Worst 0 1 2 3 4 5 6 7 8 9 10 Best

Visual Aids were effective

Worst 0 1 2 3 4 5 6 7 8 9 10 Best

Handouts were useful and "keepers"

Worst 0 1 2 3 4 5 6 7 8 9 10 Best

Seminar kept my interest

Worst 0 1 2 3 4 5 6 7 8 9 10 Best

I could take this seminar again, actually

Worst 0 1 2 3 4 5 6 7 8 9 10 Best

Suggestions for improvement:

Infectious Diseases Laboratory
Department of Medical Microbiology/Parasitology
[501 DW Brooks Drive]
College of Veterinary Medicine, University of Georgia

Athens, GA 30602-7386

Phone: (706) 542-8092 FAX: (706) 583-0843

TESTS AND PRICES EFFECTIVE 1 JULY 2002

AVIAN AND EXOTICS SUBMISSION FORM

For Laboratory Use Only
SUBMISSION NO:
Date Received:

Doctor's Name:		Phone: ()	
Hospital:		FAX: ()	
Address:		Dedicated FAX? <input type="checkbox"/> Yes <input type="checkbox"/> No	
City:	State:	Zip:	There is no additional fee for FAXing results

1 Please use one form for each owner - more than one animal can be entered on a form. Please fill in the information requested and Print Clearly. The sample(s) required and the price are listed with each test.

2 Circle the underlined test(s) requested for each patient, circle the sample(s) to be run for each test and double check that the sample(s) enclosed match the test(s) requested.

OWNER:		SAMPLE DATE:	
1 Patient ID:	Species:	Breed:	Age: Sex:
AVIAN Tests - DNA Probes		Other Tests	
<u>Psittacine Circovirus - 1</u> (PBFDV)	whole blood	\$16.00	<u>Avian Virus Isolation (in tissue culture)</u> refrigerated/frozen fresh tissue \$75.00
<u>Psittacine Circovirus - 2</u> (PBFDV)	environmental swab	\$16.00	
<u>Psittacine Circovirus - 1</u> and - 2	whole blood	\$16.00	<u>Blood culture - Any Species</u> 0.75 to 1 ml of blood in BBL SEPTI-CHEK-BHI 20 ml bottle \$40.00
	environmental swab	\$16.00	
	whole blood	\$25.00	<u>Culture and Sensitivity - Any species</u> sterile tissue swab \$40.00
	environmental swab	\$25.00	
<u>Avian Polyomavirus</u>	choanal/cloacal swab	\$16.00	
	whole blood	\$16.00	
<u>Chlamydia spp.</u>	choanal/cloacal swab	\$16.00	for Reptiles
	whole blood	\$16.00	<u>Salmonella spp. DNA probe screening test</u> swab of excrement or cut tissue \$25.00
<u>Sex Identification</u>	whole blood	\$20.00	
AVIAN Tests - Antibody Titers		for RABBITS	
<u>Avian Polyomavirus</u>	separated, non-hemolyzed serum	\$10.00	<u>Pasteurella multocida</u>
<u>Chlamydia spp.</u>	separated, non-hemolyzed serum	\$15.00	<u>Clinically ill rabbits</u>
<u>Pacheco's Virus</u>	separated, non-hemolyzed serum	\$10.00	<u>Panel</u> separated, non-hemolyzed serum and deep nasal swab \$26.00
AVIAN Panels - DNA Probes and Serology or Histopathology		Screening test	
<u>Psittacine Circovirus Feather Pathology</u>	whole blood and blood feather with skin attached in 10% buffered formalin	\$42.00	Antibody separated, non-hemolyzed serum 12.00
<u>Psittacine Circovirus 11 and 21 Feather Pathology</u>	whole blood and blood feather with skin attached in 10% buffered formalin	\$55.00	DNA Probe deep nasal swab 14.00
<u>Avian Polyomavirus Panel</u>	swab and whole blood and separated non-hemolyzed serum	\$38.00	for Fish
<u>Chlamydia spp. Panel</u>	swab and whole blood and separated non-hemolyzed serum	\$42.00	<u>Koi Herpes Virus DNA probe screening test</u> swab of cut tissues \$28.00
			<u>Fish Virus Isolation</u> (in tissue culture) refrigerated fresh or frozen tissue \$75.00

PAYMENT and REPORTING: A bill will be sent at the end of the month for all tests received during that calendar month unless payment is received with sample. We can not accept credit cards for payment. Checks should be made to the Infectious Diseases Laboratory. Results will be sent to a secure FAX machine if a FAX number is given or returned by first class mail. The receiver accepts responsibility for the security of the receiving FAX machine.

Check # Amount:

PO #

Veterinarian's Signature - Required for sample testing:

Billing Name and/or Address if different from above:

My signature certifies that I have read and understand the instructions given for sample submission. Additionally, I accept that the records of the Infectious Diseases Laboratory of the University of Georgia's College of Veterinary Medicine are confidential to the extent allowed by the law and the policies of the University of Georgia as defined by the Board of Regents. No results can be given by telephone. In no event shall the Infectious Diseases Laboratory, the personnel of the Infectious Diseases Laboratory, the College of Veterinary Medicine, the University of Georgia, the Board of Regents nor the State of Georgia be liable for incidental, consequential, special or other damages arising from the testing of sample(s) or the providing of test results.



Fast Fish Medicines PondRx.com

Visit PondRx.com for more articles!



When fish are sick, you can't wait for the guy in the garage to get around to shipping your meds. We ship fast and we have what you need for fish, sick or healthy! Economical fish foods, pond supplies, water conditioners, and more!

The difference is this: "You name it, but we might not have it!" Because we don't sell stuff that doesn't work! So there's a lot of items you'll never see on Pondrx.com. Never have to worry about buying useless junk.

706 374 3037

For bacterial sores:

Warmer water, salt at 0.3%, medicated food like MediKoi and injections would be recommended. Tricide Neo can be sprayed on. PondRx stocks all these remedies, ready for your needs, including heaters, and water test kits to make sure the water is good enough for healing!

For flukes:

Pondrx.com recommends the use of either Supaverm or Prazi - both of which are filter safe and easy to use. Malathion can also be used. We have a book that describes that. Supaverm kills goldfish but Prazi does not. You get explicit instructions on the use of these medicines with your order.

For lethargy, clamped fins:

First, test your water pH and nitrogen numbers. We have test kits that are cheap and easy to use. If your water tests well, salt to 0.3% and send us a fish specimen and we will give you a free diagnosis!

For rapid losses:

Water testing first, then salt to 0.3% and call us! We will accept samples perform wet mounts, and tell you what's wrong at no cost!

For Costia:

Sometimes Costia is best treated by removing the Koi and treating them with Proform C in a holding tank, then treating the pond with double dose Potassium. We sell both with clear instructions.

Visit PondRx.com for more articles!

Volume estimate:

Length x Width x Depth (all in inches) divided by 231 gives US Gallons.

Salt 0.3%: Three pounds of salt per 100 gallons (No trace minerals or YPS, salt should be pure)

When raising temperature, do not raise it more than one degree per hour!

Make sure your pH is always ABOVE 7.0

Water changes at 10% per week are highly, highly recommended! Or change 20% every 2 weeks.

Other Sites Of Service:

Koivet.com

Message board, chat area, and hundreds of articles on fish health for you to read and learn from.

PondCrisis.com

Step by step help for sick fish, this site breaks a pond crisis down into a simple, twenty step diagnostic process.

KoiCrisis.com

Organized in sections about medicines, symptoms, water quality and more, this is a great fish health site.

KoiGallery.com

Show off your fish, simply create an album, and upload your best Koi images!

For Rush Service Call 706 374 3037