Getting Started on the Right Foot - Considerations for Healthy Ponds and Fish

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Getting started on the right foot towards a healthy system and healthy animals is as simple as 1-2-3.

- Define point A (what do we possess)
- Define point Z (what do we desire)
- Define how we get from point A to point Z

Point A: What do we possess

- A desire
- An interest
- The know-how or experience
- Time
- Space
- Money

Point Z: What do we desire

- Healthy Systems
- Healthy Animals

How do we get from point A to point Z?

We travel the Critical Path to Fish Health

10 steps to healthy systems - healthy fish

1. **DEFINE** your goals
2. **LEARN** about your animals
3. **PLAN** for healthy animals
4. **UNDERSTAND** how water quality affects your animals
5. **IDENTIFY** reliable resources
6. **PRACTICE** biosecurity
7. **PRACTICE** daily health management
8. **RECOGNIZE** disease
9. **WORK** the problem

10. **RE-EVALUATE** continuously

The Critical Path to Fish Health – In detail

Step 1: DEFINE your goals

- Fully understand the scope of care involved in maintaining aquatic animals and their environment.
- Understand the commitment required towards being a responsible pet owner.
- Fully understand the financial commitment required.
- Fully understand the time requirements for maintaining healthy aquatic animals.
- Fully understand your level of operations.

The keys to achieving the before mentioned goals:

- Research
- Ask questions - Professionals, experienced hobbyists
- Join a club
- Trial and error - Keep records

NEVER go at it blindly or uninformed!

Step 2: LEARN about your animals

- **Knowledge of your fish (biology and natural environment)**
  - Husbandry requirements
  - Appropriate pond size and construction
  - Nutrition
  - Water quality
  - Common disease problems – Response to disease
  - Know the fish source and the health history
  - Sources of Knowledge

- **Good sources of information:**
  - Check with your local fish pond retailer – check author's credentials.
  - AKCA Guides
  - *Manual of Fish health*, Chris Andrews
  - *Manual of Koi Health*, Keith Holmes and Tony Pitman
  - Local Koi and water garden clubs

- Associated Koi Clubs of America
- Koi USA
- Koi Health Advisors – Volunteer health and husbandry resources for hobbyists. They're associated with your local koi and water garden clubs
- AKCA Judges
- Experienced hobbyists
- On-line message boards – use this information with some caution.

- **Web Resources**
  - http://edis.ifas.ufl.edu/deptlist.html
  - http://www.fishbase.org/home.htm
  - http://www.aquavets.com
  - http://seagrant.oregonstate.edu/extension/miller-morgan.html
  - http: //www. akca .org
  - http: //www. koitime .com/content/microscopy.html
  - http: //www. koitime .com/content/koi _ bbs.htm
  - http: //www. koivet.com

Step 3: PLAN for healthy animals

- **System Design**
  - Design the tank/system for ease of care & healthy fish
  - High quality tank or pond environment
  - Appropriately sized pond for the number of fish (1lb/66 gallons)
  - Appropriately sized & functioning filtration system
  - Consideration of water source
  - Plenty of shelter spaces - protection from predators
  - Ease of catching up fish
  - No sharp edges
  - Drains and pump inlets protected
  - Pond protected from run-off/drift
  - Appropriately sited
  - No metals in the tank or pond

- **Quarantine**
  - Should have a separate quarantine system
  - Own filtration
  - Separate nets, bowls, totes, etc.
  - Away from main pond or tank

    - Equipment soaked in disinfectant for the appropriate time & allowed/air dry
    - Tanks should be kept clean of organic debris & uneaten food
    - Reduce crowding
    - Simple habitat - easy to clean
    - Husbandry
    - Daily check of all the fish & Life support systems

- **Develop a regular maintenance schedule**
    - Pond cleaning
    - Filter cleaning & maintenance
    - Pump maintenance
    - UV sterilizer maintenance
    - **`Procrastination leads to disaster`**

- **Water Quality**
    - One of the keys to healthy systems - healthy fish
    - Regular water quality testing
    - **Daily**: Check water temperature
    - **Weekly**: Check pH, ammonia (NH_3) Nitrite (NO_2) alkalinity, salinity, & dissolved oxygen (DO2)
    - **Monthly:** Check nitrates (NO_3) & hardness
    - Record this information
    - Monitor for trends

Step 4: UNDERSTAND how water quality affects your animals

- Each one of the following parameters affects your fish either positively or negatively.
    - Temperature
    - pH
    - Dissolved oxygen levels
    - Ammonia
    - Nitrites
    - Nitrates
    - Alkalinity
    - Hardness
    - Salinity

Step 5: **IDENTIFY** reliable resources for animals, equipment and information

- **Fish and plant source reliability**
    - Generally, domestically reared pond fish are safer than imported fish.
    - Do the animals appear healthy?
    - Is the staff knowledgeable about fish care?
    - Do they quarantine all new fish? For how long?
    - Do the fish come from multiple sources? If so, are they mixed in the same tank?
    - Do the display tanks and ponds appear to be clean and well maintained?
    - Do you observe any dead fish?
    - Are any dead fish removed immediately upon identification?
    - When disease occurs do the owners attempt to identify the cause of disease? How?
    - Do they utilize a veterinarian or other fish health professional when difficult disease problems arise?

- **Equipment reliability**
    - Knowledgeable staff?
    - Technical support?
    - Discuss with other hobbyists or professionals who have used the equipment before you purchase.
    - Options offered?
    - Equipment available for different budgets?
    - Working examples available?
    - Equipment return policy reasonable?
    - Biological, mechanical and chemical filtration options?
    - Biosecurity measures considered?

- **Assessing reliability of information**
    - **Credibility**
        - Trustworthy source
        - Author's credentials available

- **Accuracy**
    - Up-to-date
    - Factual
    - Whole truth given
- **Reasonableness**
    - Fair/balanced
    - Objective
    - No conflict of interest
- **Support**
    - Listed sources
    - Contact information
    - Claims supported

Step 6: PRACTICE BIOSECURITY

- Biosecurity is the preventive measures taken against disease introductions and outbreaks.
- Should address human health risks as well
- Reduces the numbers of disease causing organisms in the environment.
- Specific measures that vary at each facility.
- Biosecurity is a way of thinking.
- Addresses all aspects of animal care

Step 7: PRACTICE DAILY HEALTH MANAGEMENT

Health Management - defined

- Management practices designed to prevent disease among captive fish and invertebrates.
- Two major goals:
    - To maximize immune competence in the fish populations.
    - Reduce or eliminate potential pathogens and other disease causing factors

QUARANTINE IS CRITICAL FOR KEEPING YOUR PETS HEALTHY

Why do we Quarantine?

- Isolation of new animal(s) to prevent disease introduction into existing population
- Providing a quiet stress-free area for acclimation and/or recuperation
- Acclimation to new feeds
- Acclimation to new water parameters
- Introduction to new husbandry protocols

QUARANTINE EVERYTHING!!!

- All new fish & plants
- Any fish that have had contact with fish from other systems:
    - Japanese style shows
    - Auction fish
    - Fish that may have been exposed to water from other systems
- Plants - separate from the fish

Quarantine protocols

- Quarantine for a **MINIMUM** of 30 days
- Monitor animals daily for signs of distress & disease
- Carry out a basic physical examination
    - Visually
    - Skin scrape
    - Gill snip
- Address any existing disease conditions
- Ability to easily monitor the fish
- Simple habitats & substrate
- Easy to clean
- Simple filtration
- Easy to bypass the biological filter
- Ability to darken the tank

Transport and Acclimation protocols

Transporting the fish

- Appropriate techniques for the animals
- Low density is the best

- Aeration/oxygen
- In water
- No water, but kept moist
- Properly insulated
- Packed to avoid trauma during
- Water additives:
    - Buffers
    - Ammonia neutralizers
    - Sedatives
    - Antibiotics

Acclimating the fish

- Slowly acclimating the fish to the temperature & pH of the new system is important
- Understanding what's going on in the transport bag is just as important
- More than one method of acclimation is practiced
    - Floating bag
    - Trickling water from the system
- With every type of acclimation the following are top priorities
    - Getting the fish out of the transport bag & away from the high levels of ammonia within that bag s soon as possible
    - Slowly acclimating the fish to the new water parameters
- **NEVER** adding transport bag water to the quarantine system

Water Quality & Health Management protocols

- Weekly at least 10% water changes
- Partial water changes are also an important part of maintaining healthy systems - healthy fish
    - Reduces levels of accumulated nitrates
    - Boosts the alkalinity (dependent on the make-up of the incoming water)
    - Recharges many of the depleted minerals
    - Dilutes accumulated toxins
    - Lowered nitrate levels may equate to lower levels of hair algae
- Water should be replaced with dechlorinated water

- Water changes should be carried out immediately in the event of ammonia or nitrite spikes and/or chlorine toxicity.

Nutrition & Health Management protocols

- Use only high quality feeds
- Variety is the spice of life
- Consider Fall and Spring feeding regimes
- Provide fresh vegetables/fruits for herbivorous fish
- Check dates on feed
- Buy feed in 1-6 month increments
- Store feeds in refrigerator or freezer
- Don't feed moldy or damp food

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Step 8: RECOGNIZE disease

Recognition and response to diseases

- Watch the fish closely
- Look for signs of disease
- Respond early and quickly
- Learn, become aware of what is normal or abnormal for your fish
    - Feeding behaviors
    - Swimming behaviors
    - Social behaviors

Diagnosis: Signs of disease

- Off feed
- Lethargy
- Increased respiration
- Isolation from group
- Flaring of gill covers
- Excessive mucus production
- Thin
- Popeye
- Changes in the eye surface
- Blood in eye(s)

Diagnosis: How & Who

- A proper diagnosis is mandatory before initiating a treatment.
    - Initiating a treatment w/o a proper diagnosis can be harmful

- You can learn how to do a **basic** health examination (A good microscope is mandatory) from the following sources:
    - Fish Health Professional
    - Veterinarian

Step 9: **WORK** the problem

- **DON'T PANIC!!! RELAX!!!**
    - Identify the specific problem(s)
    - Act on the most life threatening problems first
    - Avoid shotgun "treatments"

- **Working the problem: Assistance with husbandry and general health assessments**
    - Koi Health Advisors – check with your local koi club
    - Diagnosis of issues and disease management strategies: Local Veterinarians
        - See list of veterinarians in WA and Or that see pet fish

        - Dr. Tim Miller-Morgan, DVM - Hatfield Marine Science Center
          2030 Marine Science Drive, Newport, Or 97365
          Office: (541) 867-0100 Cell: (541) 270-4218
          tim.miller-morgan @ oregonstate.edu

        - Local diagnostic laboratories accepting koi
          Veterinary Diagnostic Laboratory
          Magruder Hall, Room 134, 30th & Washington Way
          Corvallis, OR 97331
          Phone: (541) 737-6817 Fax:(541) 737-6817
          Dr. Jerry Heidel, DVM, PhD, DACVP, Director, VDI

          Washington State University - WADDL
          155 N. Bustad Hall,
          Pullman, WA 99164-7034
          Phone: (509) 335-9696 Fax: (509) 335-7424
          Dr. Danielle Stanek, DVM, Aquatic Health Associate

Working the problem: Treatment protocols

- **Optimally - should have a hospital tank**
  - Quarantine tank can double as a hospital tank
  - Separate filtration system
  - Heated
  - Simple habitat - easy to clean
  - Appropriate for fish size, ability to darken
  - Separate nets, totes, own disinfection bath

- **Most health problems can be addressed by:**
  - Addressing husbandry issues
  - Warming the affected fish
  - Over-the-counter medications (salt, potassium permanganate, formalin)

- **Treatment: Antibiotics**
  - Antibiotics are generally only for the treatment of bacterial infections
  - Antibiotics should be used with caution and only with a proper diagnosis
  - Once antibiotic therapy is started
    - Proper dose
    - Proper length of time - 7-10 days minimally
  - Antibiotics DO NOT cure bacterial infections
  - Antibiotics are an adjunct to the fish immune system
  - With a proper diagnosis, multiple antibiotics are rarely needed.
  - In appropriate use of antibiotics has and will lead to antibacterial resistance.

Step 10: **RE-EVALUATE** continuously

- Status/health of your fish
- Status/health of all systems
  - Filtration
  - Life support
  - Pond/tank environment
- Husbandry & maintenance protocols
- Transport & acclimation protocols
- Hospital & quarantine protocols
- Effectiveness of any treatment
  - Always recheck the fish after any treatment to assess elimination of the disease.

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