Aquaponics: Fish Production

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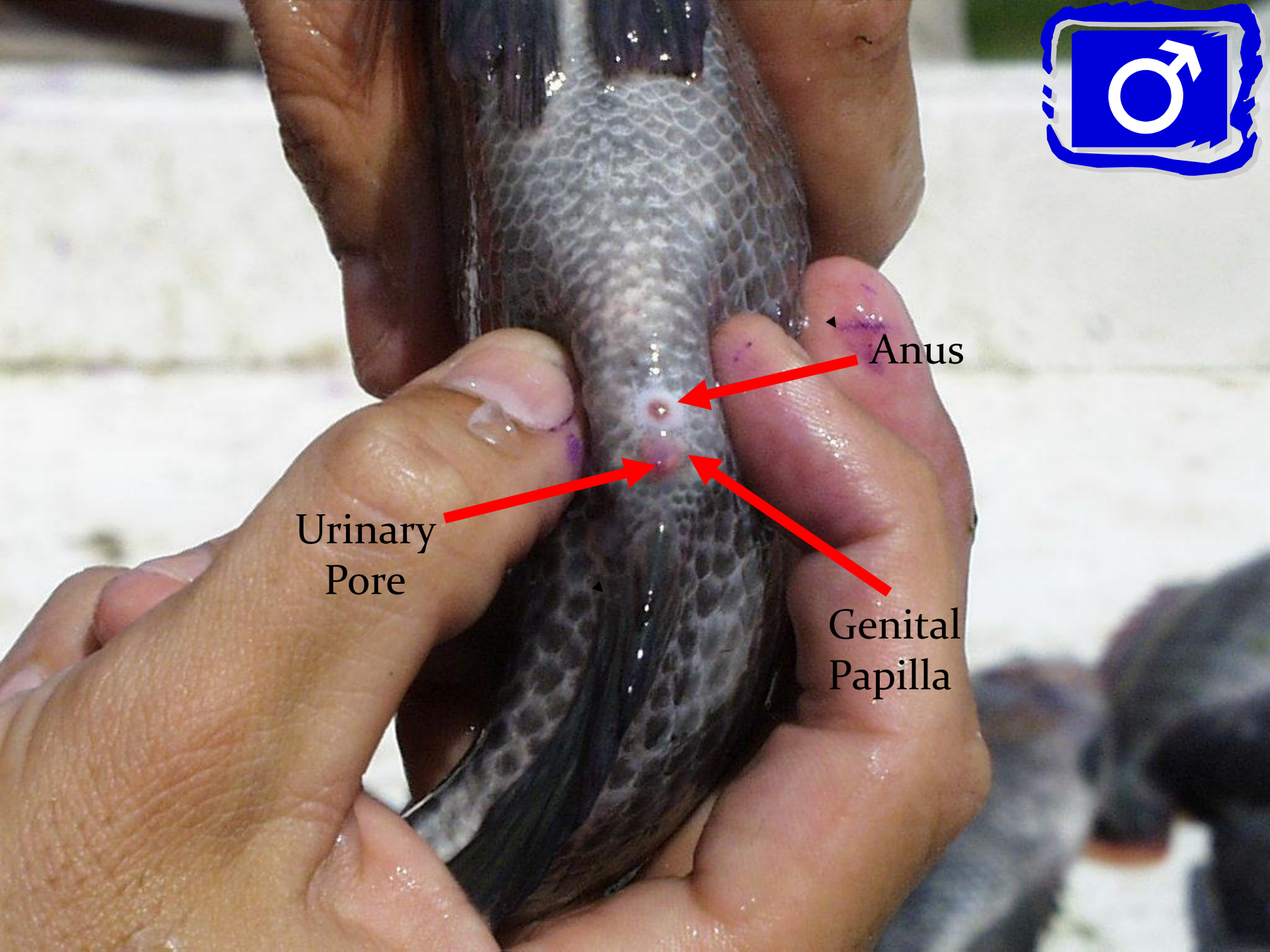
Ideal Attributes for Aquaponics

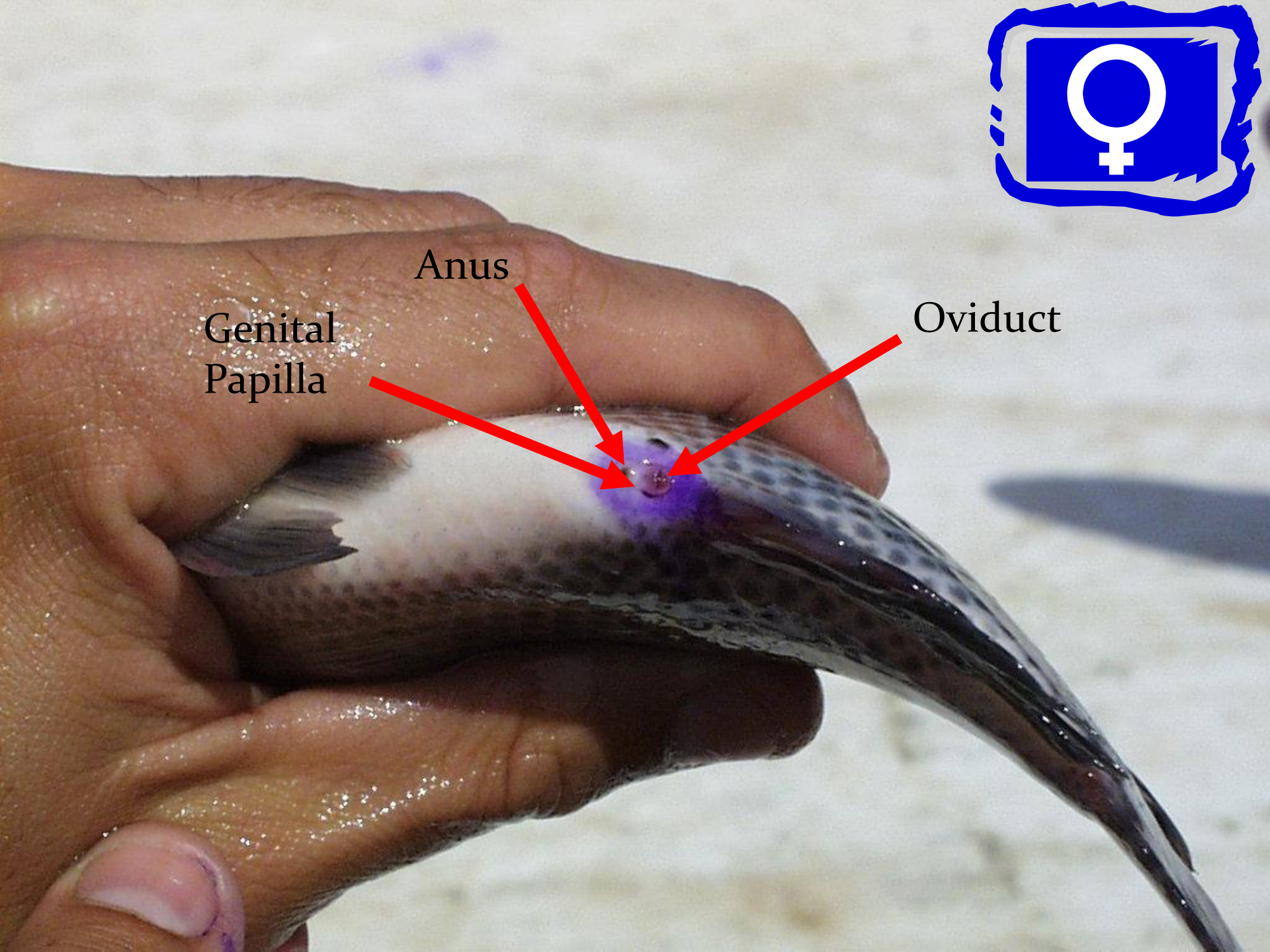
- Ease of culture in RAS
- Easily trained onto commercial diets
- Fast growth
- Tolerant to stress and poor water quality
- Resistant to disease
- Low FCR
- Easily reproduced
- Temperature and oxygen demands similar to plants
- Marketable

Species Cultured in Aquaponic Systems

- Tilapia
- Trout
- Barramundi
- Murray Cod
- Silver, Golden and Jade Perch
- Koi and Grass Carp
- Bluegill and Bass
- Hybrid Stripped Bass

- IS IT LEGAL?


Anus
Urinary
Pore
Genital
Papilla


Anus
Genital Papilla
Oviduct

Lethbridge College Nutrient Generators

Advanced Fingerling - Tilapia

Feed Chart

Size	Feed Type	% Body Weight
Yolk absorb to 1.5 g	MT (Powder)	25-15%
1.5 – 5 g	Fry Starter 200 (Powder)	10%
5 – 20 g	Rangen Extra 450 (1/16”)	6%
20 - 50 g	5DO8 (3/32”)	3%
50 – 700 g	5DO7 (1/4”)	3-1%

Typical Protein Requirements for Tilapia

First feeding fry	45 – 50%
0.02 – 2.0 g	40%
2.0 – 35.0 g	35%
35.0 g - Harvest	30 – 32%

Types of fish pellets

- **Sinking**
  - **Must be fed slower**
  - **Hard to observe fish**
- **Floating**
  - **Has air pockets**
  - **Easier to observe fish**

Feeding Strategies

- **Ad libitum or Satiation:**
  - **Feed all fish will eat during timed period**
    - **2 - 4x/day**
  - **Farmer understands his/her “fish personalities”**

- **Percent Body Weight/Day**
  - **Based on growth rate, FCR, and survival**
  - **Requires frequent sampling**
    - **Divide daily ration; fed 2 - 4x/day**

Feed Presentation

- **Hand feeding**
  - **Advantages**
    - **Fish observation**
      - **Healthy, vigorous feeding**
  - **Disadvantage**
    - **Labor intensive**
- **Demand feeder**
  - **Advantages**
    - **ad libitum, less labor**
  - **Disadvantages**
    - **Nature, higher FCR, bullies, breakdowns, capital costs**

Feed Storage

- **Inadequate storage leads to nutrient loss**
  - **Sunlight = vitamins**
  - **Heat = rancid fats**
  - **Damp = molds**
- **Cool, dry place**
  - **Air-conditioned room**
  - **Use before expiration date (3 months)**
  - **Don’t stack higher than 10 on pallet**
  - **First in, first out strategy**
- **Rodent resistant**
  - **Eat and defecate on food**

Feed Fish Properly

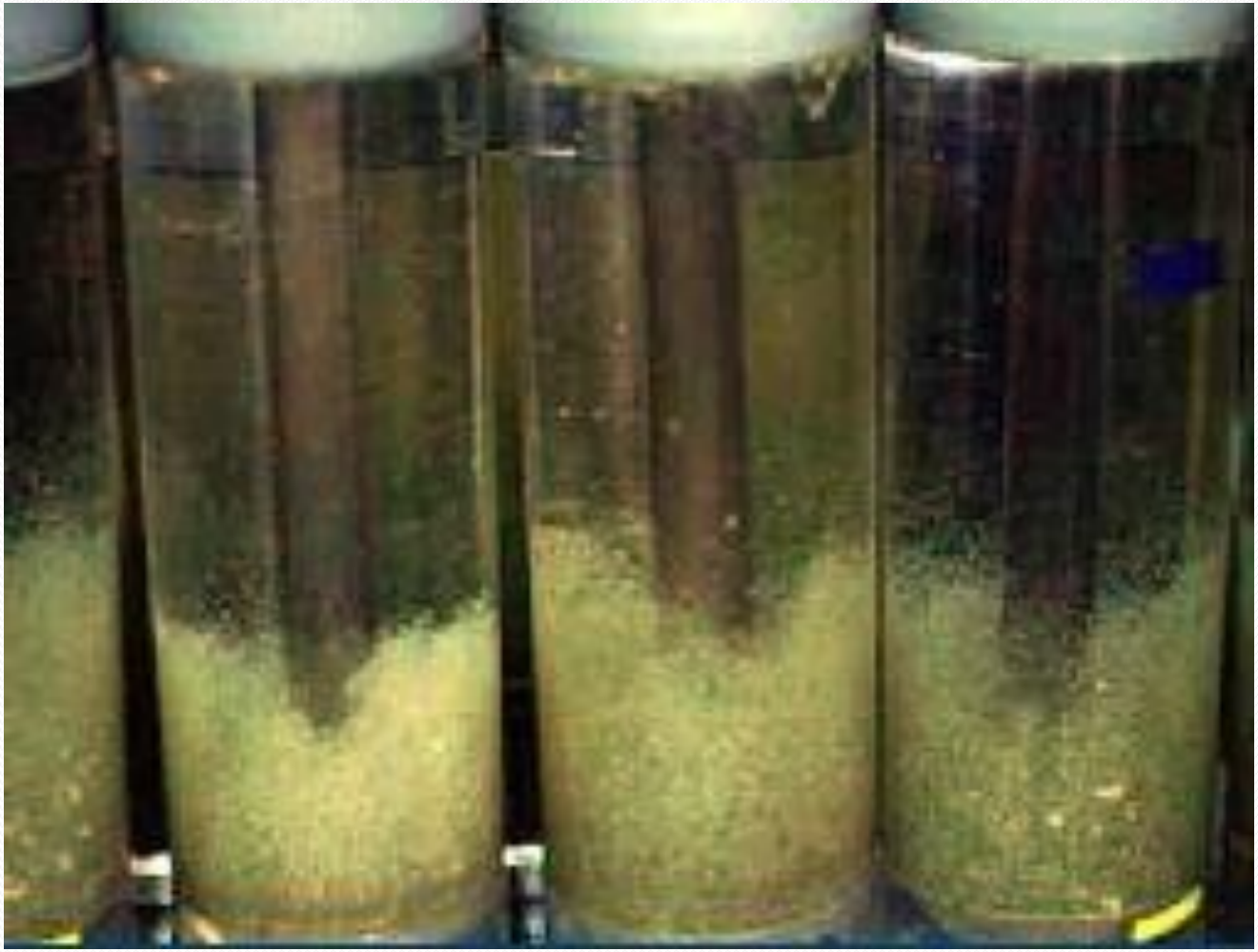
- **Water quality controlled**
- **High growth and low FCR**
- **Uniform**
  - **Bullies/runts**
  - **Dress-out**
- **Nutrition-linked diseases eliminated**
  - **Scoliosis, cataracts, fat deposits, etc.**

Feed Fish Improperly

- **Poor water quality**
  - **Ammonia, nitrite, pH, oxygen**
- **Slow growth and high FCR**
- **Nutrition-linked diseases prevalent**
- **Less uniformity**
  - **Size variation**
  - **Dress-out percentage low**

Tilapia Spawning Behavior

- Male establishes territory in tank
- Female approaches, courtship occurs
- Female spawns and male fertilizes the eggs
- Female picks up eggs into mouth and incubates them for 3-6 days until hatch
- Sac-fry continue to be protected by mother for additional 5-days until yolk is absorbed and they eat commercial feed



Counting Fry

- **Counting fry**
  - **Visually estimated**
  - **Too small for accurate weight count**
    - **First count 400 – 500 per container**
    - **Compare and visually "guestimate"**

Estimating Fry Number

Other Fishy Concerns

- Alternative Feed Ingredients/GMOs
- Disease Prevention/Identification/Treatment
- Selling/Processing Fish
- Vendors
- GET TO KNOW YOUR EXTENSION AGENTS!

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