

Lecture 11a



Spawning Catfish

Spawning Broodfish



Catfish

- One of the easiest fish to breed in captivity
 - Males have to be sacrificed
- Broodfish should be between 2-4kg
 - Larger fish can be difficult to handle and produce poorer quality eggs
- Females can be spawned every 2-3months



Fish husbandry



- ❧ Step 1 – Choose your fish
 - ❧ Select a number of fish to spawn
 - ❧ A single fish will produce 100's of thousands of eggs
 - ❧ Some genetic variability is good.
 - ❧ 2-3 females and 4-5 males
 - ❧ 250 000 – 1 000 000 fingerlings
 - ❧ Choose fish that look strong and healthy
 - ❧ Select the fastest growers
 - ❧ Separate the males and females into conditioning tanks



Fish husbandry



❧ Step 2 – Conditioning the broodfish

- ❧ Maintain a constant water temperature between 26°C and 28°C
- ❧ Ensure a good flow with clean good quality water
- ❧ Feed regularly with a high protein diet
 - ❧ Raw chicken livers work very well for this
 - ❧ Approximately 1-2 livers per fish per day
 - ❧ 2 to 3 weeks
 - ❧ Females abdomen is large and distended
 - ❧ Check ovipositor – swollen and inflamed



Fish husbandry



❧ Step 3 – Prepare for spawning

- ❧ To induce ovulation in the female and ripen the sperm in the male you will need to inject the fish with a gonadotropin
 - ❧ This can be bought from various suppliers – AquaSpawn
 - ❧ Alternatively it is possible to make your own!
 - ❧ Essentially homogenised pituitary glands from a mature fish
- ❧ Inject intramuscularly
 - ❧ A good place is along the back where the muscle is thickest
 - ❧ After the fish have been injected make sure they are in separate holding tanks
 - ❧ Become aggressive and can injure and even kill each other



Fish husbandry



❧ Step 4 – Spawning

- ❧ At 27°C the female should be ready to spawn after about 13-20 hours after injecting
- ❧ Make sure everything you need for spawning is clean, dry and ready
 - ❧ Paper towel
 - ❧ A towel
 - ❧ Bowls
 - ❧ Sharp knife
 - ❧ Clean water



Fish husbandry



❧ After 13 hours check...

❧ When handling

❧ Always make sure hands are wet

❧ Be calm and relaxed

❧ Do not try hold to tight of restrict movement to much

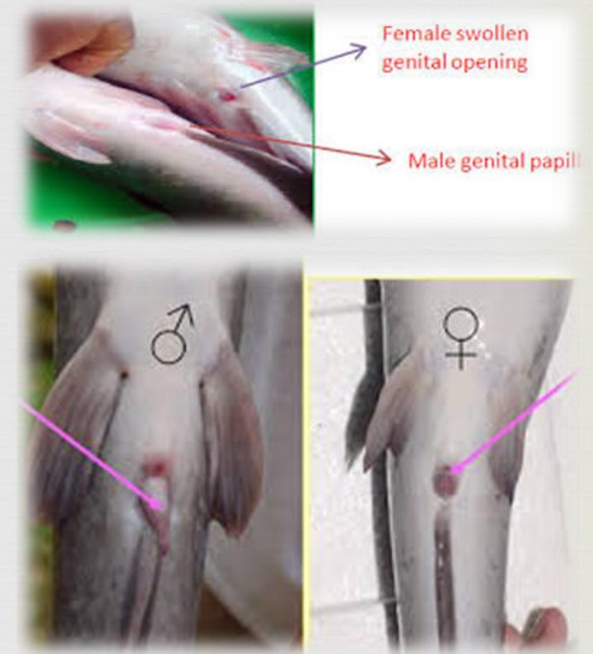
❧ Anticipate the movements and wait for the fish to calm down



Fish husbandry



- ❧ Examine the belly and ovipositor
 - ❧ The belly should feel soft as if full of liquid
 - ❧ The ovipositor will be distended and red
- ❧ Holding the fish against the side of the tank or against your body gently add pressure to the abdomen from between the pectoral fins in a downwards direction.
 - ❧ If eggs begin to come out the fish is ready to spawn
 - ❧ If no eggs are released or you need to use excessive force wait 2 hours and try again.



Fish husbandry



❧ Once satisfied the fish are ready

❧ Remove the fish from the tank

❧ Place it in a dry towel

❧ This is not good for the fish, only dry a fish if you have to

❧ Contact with water will reduce the window for mixing with sperm and hence fertilisation to take place

❧ Cover the head with the towel to help the fish to relax

❧ Wait for the fish to stop flapping

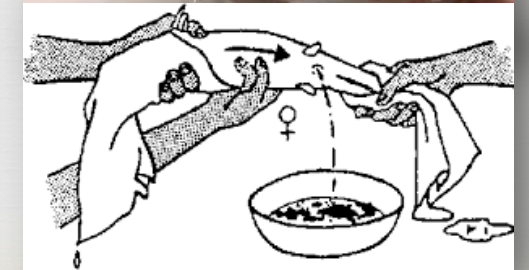
❧ Gently hold the fish in the towel to make sure it does not hurt itself



Fish husbandry



- ❧ Once the fish is relaxed you can begin stripping the eggs
 - ❧ Make sure the fish is dry, especially around the ovipositor
 - ❧ With one hand hold the tail behind the anal fin, secure the head with your other arm and gently arch the back of the fish to fully extend the ovipositor



Fish husbandry



- ❧ With your other hand apply pressure to the abdomen from between the pectoral fins, slowly move downwards as the eggs are released
 - ❧ Collect the eggs in a clean, dry bowl
 - ❧ Do not go too fast, but be efficient
 - ❧ Always be gentle
 - ❧ Do not try and get every last egg, once the eggs stop flowing freely it is better to stop.
- ❧ It is common for faeces to also be released
 - ❧ Make sure this does not mix with the eggs



Fish husbandry



- ❧ Once all the eggs have been collected it is time to add the milt/sperm
 - ❧ Unfortunately the male fish will not readily release their milt and the testis need to be physically removed in order to fertilise the eggs.
 - ❧ A single male can fertilise the eggs from many females
 - ❧ Additional males are used to ensure genetic variation
 - ❧ For “Just in case”
 - ❧ A catfish farmer will need more male broodstock than females...



Fish husbandry



- ❧ Catch the male fish
 - ❧ Place the fish in a dry towel and wait for the fish to relax
 - ❧ Using a very sharp knife open the abdominal cavity from the anus to below the jaw.
 - ❧ Sever the spinal chord by pushing the knife through the spine directly behind the head
 - ❧ Remove the gonads
 - ❧ The pituitary glands from these males can be removed and used for the next spawning



Fish husbandry



- ✧ Using a sharp knife lacerate the testis and collect the sperm
- ✧ Add the sperm to the eggs and mix gently as not to burst the eggs
 - ✧ Use your finger, or a feather to mix
- ✧ Allow a few minutes for the eggs to be fertilised



Fish husbandry



❧ Step 5 – Hatching the eggs

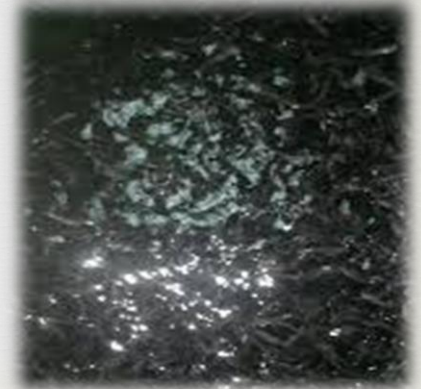
- ❧ Fertilised eggs will become sticky upon contact with water
- ❧ Quickly rinse out excess sperm and proteins with fresh water and transfer the fertilised eggs on a screen in the incubator
- ❧ At 27°C the eggs will hatch in about 36 hours
 - ❧ Placing fertilised eggs in/on a grass culture can increase survival



Fish husbandry



- ❧ Step 6 – Rearing the larvae to fry
 - ❧ This is the most tricky part of catfish farming
 - ❧ Good results here will produce good fish
 - ❧ Catfish larvae and fry will only eat live food...
 - ❧ If there is not enough natural food they will eat each other
 - ❧ Hatching the eggs in a grass culture ensures both enough food and refuge from other hatchlings
 - ❧ They will eat this quickly, grass should be added every day or two
 - ❧ Living yeast cultures are also very good for rearing catfish
 - ❧ Brine shrimp are excellent, but expensive
 - ❧ Use all three!



Fish husbandry



❧ Step 7 Rearing fry to fingerlings

- ❧ After about 7 days the fry should developed enough to start weaning them onto commercial feed
- ❧ Hard boiled egg yolks should be used as a supplement during the weaning process
 - ❧ Reduce the feeding of live food and begin adding powdered fish feed and crushed eggs yolks
 - ❧ Feed every 2 hours
 - ❧ Watch the fish eating making sure not to over feed
 - ❧ Look out for shoots – remove them
 - ❧ Slowly wean fish onto only fish feed diet over about 4 weeks
- ❧ By 8 weeks the fingerlings should be about 15-20 grams and can be moved into from the hatchery into nursery tanks



Fish Husbandry



Size Sorting

- ✧ Apart from good quality feed size sorting is the most important part of growing catfish
- ✧ Tanks must be checked daily for shoots and these must be caught and removed
- ✧ Collect all the shoots in a separate tank
- ✧ Keeping fish separated according to size will help to control and reduce cannibalism



Fish Husbandry



Size Sorting

- Sorting fish is time consuming, but must be done regularly and accurately
 - Sorting by hand will take too long
 - Fish graders allow a farmer to quickly separate different size fish from each other
 - Simple screens can do the same job
- Once the fish are sorted by size it is important to know how many fish you have



Fish Husbandry



❧ Counting every fish is impractical

❧ Estimate

❧ Carefully could out 100 fish

❧ Weigh these

❧ Repeat this 2 to 3 time

❧ Add the weights of the 3 samples together

❧ Eg 100 fish = 84.5g

❧ 100 fish = 89.3g

❧ 100 fish = 78.9g

❧ Total 300 fish = 252.7g



Fish Husbandry



- Now divide 252.7 by 300 fish to estimate the weight of a single fish
 - $252.7/300 = 0.842$ grams per fish
- Now weigh all the fish in the tank
 - Lets say it is 2.5kg
 - Divide the total weight of the tank by the weight per fish to estimate the total number of fish.
 - $2500g/0.842 = 2969$ fish
- For catfish you need to do this every 2 weeks!

