



### Induced Spawning

- A range of hormones can be used, however primary hormones used are:
  - pituitary extracts and purified gonadotropin to stimulate the ovaries and testes
  - Luteinising hormone releasing hormones (LHRHa) alone or in combination with dopamine blockers which enhance the effectiveness of LHRHa.
  - Ovaprim most widely used



### Assessing Egg Quality and Readiness to Spawn

- The quality of the eggs and their readiness for spawning can be determined by several methods.
- Visual assessment of the fish and 'experience' can be a good indicator as discussed earlier:
  - More swelling evident at the front (throat area) or the rear (anal) area when ovulation takes place for females.
  - Swollen / red urogenital pore



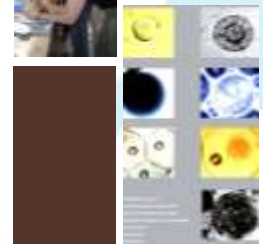
### Egg and Sperm Sampling

- A more reliable method for assessing maturation is by taking a sample of eggs or sperm and examining them under a microscope.
- This is generally only used for larger or difficult to breed species
- Sperm or milt samples can be taken fairly easily from most species when the male is ready for spawning by gently applying pressure to the abdomen between the pelvic fins and the vent.
- Sperm viability can then be determined by observing their motility under the microscope.



### Egg and Sperm Sampling

- Sampling eggs are somewhat more difficult to obtain, and care must be taken not to damage or stress female broodstock during sampling.
- An egg sample can be taken by anaesthetising the female and inserting a rigid or flexible tube (catheter) into the ovary and removing some eggs.
- The developmental stage and readiness of the eggs can be determined through visual assessment of the diameter and appearance of the egg, and the position of the nucleus in the egg are visual indicators of development.



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- The dose rates are based on the bodyweight of fish which must be weighed to get accurate doses.
- Incorrect doses will not be effective or can harm the brood stock.
- The weighing process is best done under anaesthetic



### How much Ovaprim do I use?

- For many species, a single dose of 0.5 mL Ovaprim per kilogram fish body weight, which is equal to 0.5 µL/gram body weight, is required. There are 1000 µL per 1 mL.
- (Weight of fish in kg) x 0.5 mL/kg = mL of Ovaprim required
- For some species, we modify this and use a split dose, may improve success when repeated attempts of a single dose are unsuccessful.
  - Split dose works well with catfish species
- In this two-dose scheme, for warm water species, the first (or "priming" dose is administered using 10% of the total volume; the second dose is administered at least 6 hrs later using the remaining 90% volume





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### Injecting the fish

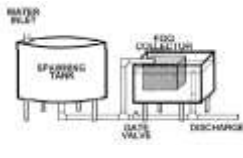
- For many species is the dorsal (top) area of the fish (IM), immediately behind or near the dorsal fin. If you are following a two-injection protocol, site the two injections on opposite sides of the fish.
- body cavity (IP or ICe), turn it so that its ventral surface (belly) is up and its posterior (back) end is slightly elevated. Inject into the body cavity in an area that is forward of but slightly off centre to the anus or vent, and be sure not to go too deep to avoid puncturing the organs



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### Spawning and Collecting Eggs

- Once fish are injected they should be placed into spawning tanks
- The time from the Ovaprim injection to final maturation, ovulation, and spermiation depends on a range of factors on the species, the water temperature, and other factors. For some warm-water species,
- Generally between 4 to 12 hours after the final injection
- In most cases it is best to leave the fish to spawn 'naturally' – this will generally give the best results
- Tank needs to be setup with correct spawning substrate etc for the fish to spawn and make egg collection easy
- This works well for many species i.e. Sharks etc



### Hand Stripping Harvesting Eggs and Sperm

- For some species you may need to hand strip the eggs and milt from the broodstock
- Hand stripping is generally stressful and should not be used if fish will spawn naturally



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### Hand Stripping

- Stripping needs to happen after the females have ovulated and the eggs are ready for release, prior to this the viability of eggs is poor
- Females should be checked every 30 to 45 minutes before anticipated spawning time
- Ovulation verified when eggs flow freely from the vent (most spp.)



### Hand stripping...

- The fish is turned belly up and gentle finger pressure is applied to the abdomen starting at the pectoral fins, moving slowly toward the vent.
- Do not try to squeeze or force the eggs from the fish (injury)!
- If you only get a few eggs, then put 'er back! She ain't ready!
- Eggs and milt are ci





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### Hand Stripping

- Eggs and milt are collected separately in dry bowls/containers
- Water can't touch the eggs at this point!!
- Water activates sperm and closes the **micropyle** (hole where sperm enter egg.)  
*For many fish, this closure takes place within only 45 to 60 seconds.*
- Solution: Keep a towel handy!



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### Fertilization

- Once you've got the eggs, repeat the same "stripping" technique with a male fish.
- Milt can be added to eggs and then slightly agitated by swirling, mixing with glass rod, or turkey feather.
- Next add some water. Hardening of the eggs will occur within several minutes in some spp.
- Move eggs to the appropriate hatching container.



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### Spawning



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### About Ovaprim



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Thankyou....

The end....

Any questions?????