

Some technical details on running carp hatcheries

The primary concern of fish hatcheries is to produce the maximum number of high quality eggs and fry from the available broodstock.

Broodstock selection and development

Broodstock must be pure and secured from a reliable source. Factors in selection are fast growth potential, adaptability to a wide range of environments, and higher resistance to stress and diseases. Bighead carp are reared to broodstock size in freshwater ponds or net cages in lakes. Males and females must be kept in separate cages or ponds. Ripening broodstock should be separated from spent spawners for easy management and selection.

In the pond, vary feed according to the season. After stripping and when breeders are still forming new eggs, a mixture of 50% natural food organisms rich in protein and 50% artificial feed with high carbohydrate content should be given. When the fish are ready for spawning, they should be given an artificial diet with low protein content.

Candidates for spawning are taken to land-based hatcheries where they are placed in a large conditioning or spawning tank. To prevent stress, selected breeders should be handled with care. A double hammock of waterproof canvass attached to a wooden or any solid frame is useful for the transport of selected breeders to and from the hatchery. Freshwater is jetted in continuously using a water pump to simulate river current, where bighead carp naturally spawn.

Induced spawning protocol

For induced spawning, hormonal injection is usually done observing either of two protocols: 1 dosage (knock-out dose) or 2 dosages (priming and decisive doses). Around Laguna de Bay, the most widely adopted injection protocol is double intraperitoneal injection method.

The priming dose is an injection of LHRHa (luteinizing hormone-releasing hormone analogue) to both males and females at about 10-20 micrograms per kg fish weight. The decisive dose is done after six hours with females getting a full dose (about 1,500 - 2,000 IU) of hCG (human chorionic gonadotropin) and males receiving half the dosage. Injections are done at the base of the fish's pectoral fin.

Artificial fertilization

About 6-8 hours after the second injection, spawning behavior is observed, indicated by males chasing and pairing off with females. After about 30 minutes, the fish

are netted out for stripping. When held ventrally, the female fish's mature ovulated eggs flow freely out from the urogenital pore. Eggs are collected in a basin. One to three males are stripped simultaneously with the female to collect milt. The eggs and the milt are mixed thoroughly for fertilization to take place. Saline solution is added to increase sperm's motility period. Water will wash out impurities. Spent carp adults are then allowed to recover by transferring them back to the broodstock cages in the Lake.

Egg incubation

A single spawn may be divided among five to six funnel-shaped or conical hatching jars, each with a capacity of 40 liters. The resulting density ranges from 800-1000 eggs per liter.

Incubation of newly fertilized eggs is critical. Close and constant supervision of important parameters include determining the level of water hardness (300-500 mg/l calcium carbonate, CaCO₃ for Chinese carps) and dissolved oxygen concentration, monitoring of embryonic environment, and protecting the eggs from fungal infection. After 13 to 18 hours, recirculating water should be changed completely at a temperature range of about 27-31°C.

Hatching is attained within 18-20 hours at 26.5°C.

Larval rearing

Newly hatched larvae remain in jars one to three days until yolks are absorbed. Mashed egg yolk may be given as supplemental feed.

When free-swimming, the larvae must now be reared in nursery tanks and then in nursery cages or plankton-rich ponds supplied with zooplankton such as *Moina*, *Brachionus*, and *Artemia*. One- to two-week-old larvae can already be sold. -- NJD

REFERENCES

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