

# Marine Fish and Culture

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# HATCHERY MANAGEMENT

- **BROODSTOCK**

- A sufficient supply of broodfish is essential for a successful induced breeding operation or artificial propagation. There are two sources of finfish broodstock: wild stock and those from ponds or cages. The disadvantages of wild stock is the uncertainty of capturing them, while the advantage of pond or cage reared broodstock is that they are already accustomed to culture conditions and consequently easier to develop into suitable broodfish.

- **SELECTION OF SUITABLE BROODSTOCK**

- Fish selected for broodstock should be fast-growing, active, and among the largest and strongest individuals of their age group, and free of parasites and disease.

- **BROODSTOCK MANAGEMENT**

- Gonad development is affected by nutrition (food) and environmental factors indicated below:

- **Nutrition**

- There is paucity of information on the nutritional requirement of broodstock and suitable practical diets. Standard practices for feeding broodstock are not well documented. At present, broodstock is fed following traditional or empirical lines. The formulated feed used are generally those commercially available as feed for rearing fish to marketable size.
- Data accumulated to date indicate that poor nutrition can result in poor or negative reproductive performance and that lack of a vitamin supplement can affect sperm quality. Reliance on natural food may also lead to poor or variable reproductive performance. It has been shown that fatty acids, especially in the case of ovarian lipids, tend to utilize the highly unsaturated fatty acids.



- **Environment**

- - Photoperiod

- One of the factors considered of great importance to the inducement of sexual maturation and spawning is photoperiod. Photoperiod manipulation is now being employed to alter the normal production of a cultured fish species, for example, mullet, rabbitfish, rainbow trout, tilapia, carp and catfish. The greatest advantage of altering the spawning time of the cultured species is the availability of fry for stocking in ponds, pens and cages throughout the year.

- - Temperature

- Water temperature is another important factor which influences the maturation and spawning of fish. Data accumulated to date show that the functional maturity in some species of fish is directly controlled by temperature; in others, the time of spawning is regulated by the day-length cycle, and occurs at the time when temperature is optimum for survival and food supply is adequate.

- - Salinity
- Some species of fish, e.g., salmon, migrate from the marine to the freshwater environment in order to spawn, while others, such as eels, migrate from freshwater to the marine environment to complete their reproductive cycle. This definitely shows that salinity is related to maturation and spawning. Salinity may influence gametogenesis but probably does not function as a synchronizer for the timing of maturation.
- - Other environmental factors
- Aside from photoperiod, temperature and salinity, other less obvious factors may affect the maturation and spawning of broodstock, such as rainfall, stress, sex ratios, stocking density, isolation from human disturbance, dissolved oxygen, social behaviour of fish, heavy metals, pesticides, and irradiation.