Marine Fish and Culture

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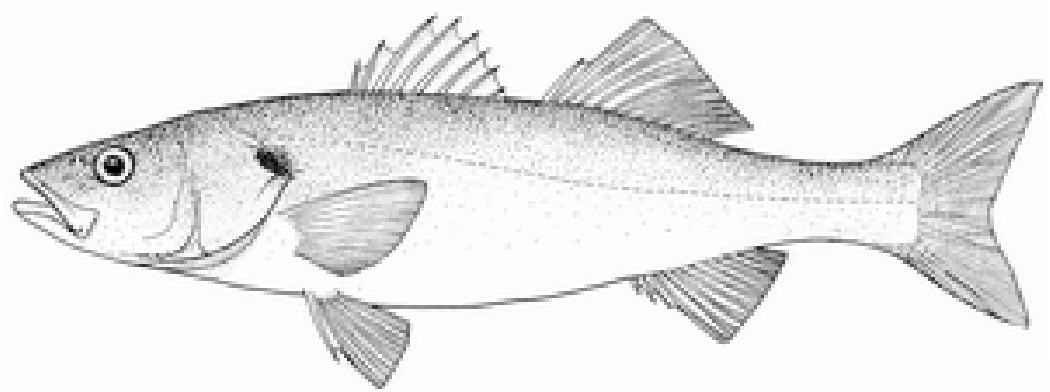
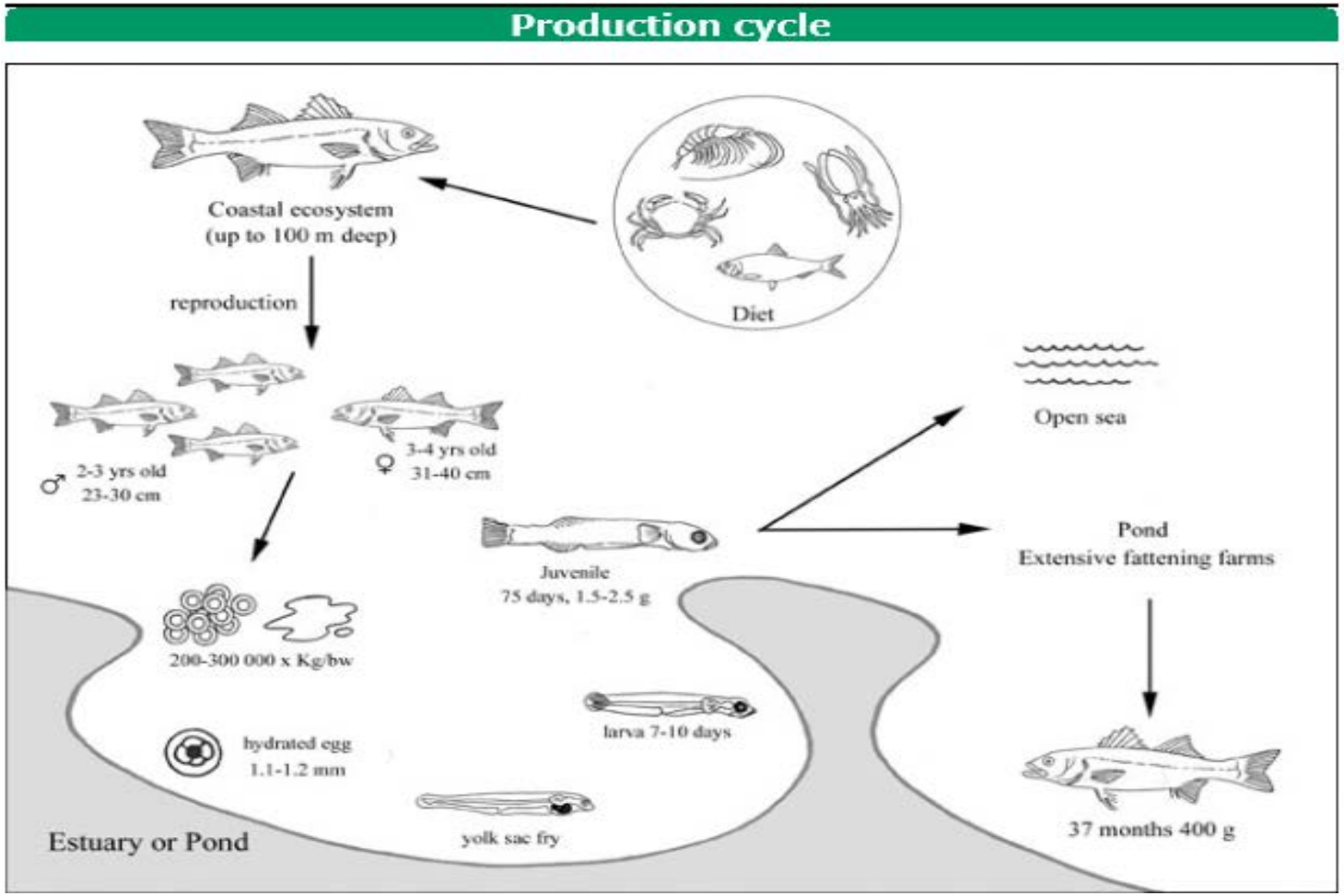
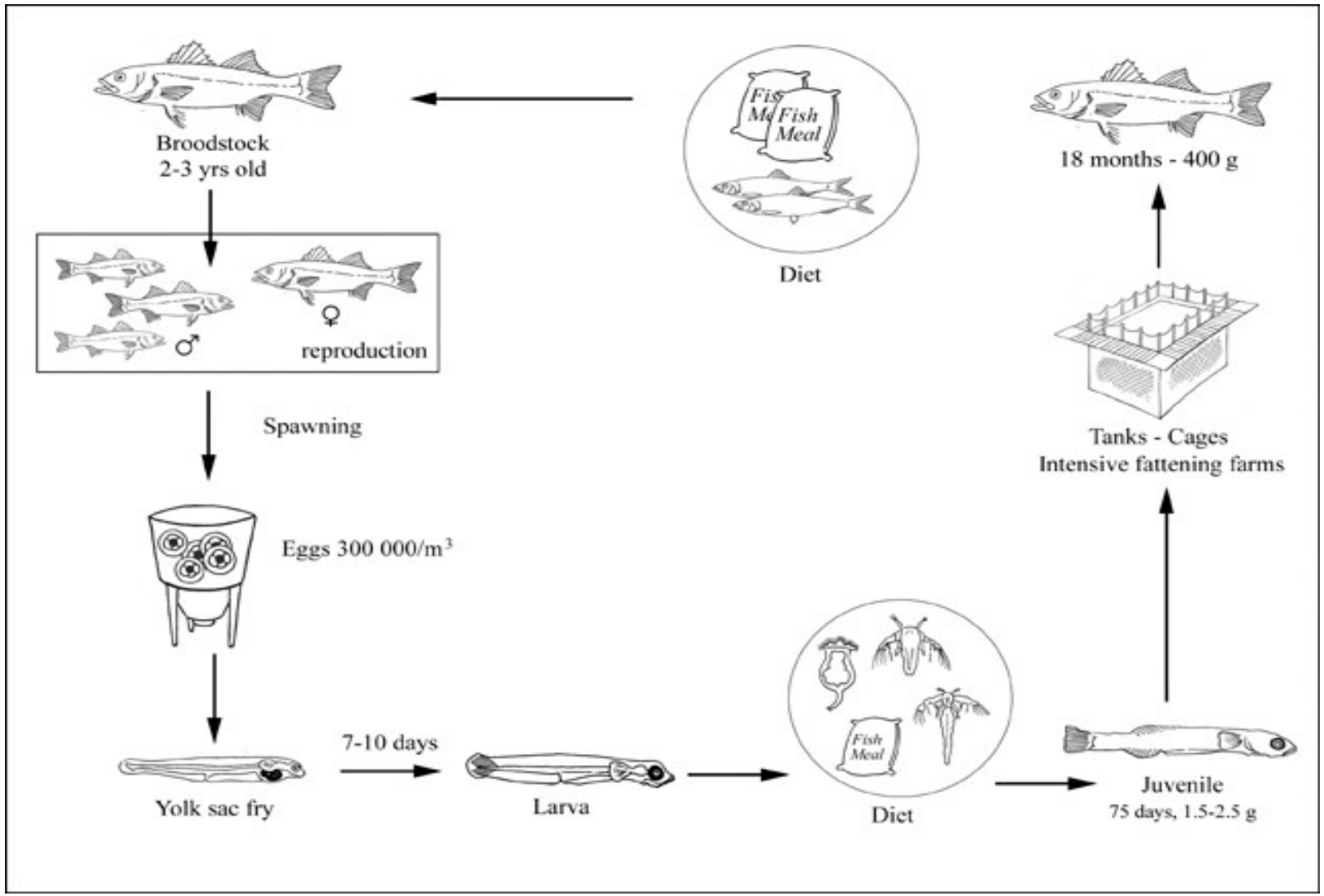
European seabass - *Dicentrarchus labrax* (Linnaeus, 1758) [Moronidae]



Production


Production cycle
Coastal ecosystem
(up to 100 m deep)
reproduction
Diet
♂ 2-3 yrs old
23-30 cm
♀ 3-4 yrs old
31-40 cm
Open sea
Juvenile
75 days, 1.5-2.5 g
Pond
Extensive fattening farms
200-300 000 x Kg/bw
larva 7-10 days
hydrated egg
1.1-1.2 mm
yolk sac fry
Estuary or Pond
37 months 400 g


Broodstock
2-3 yrs old
Fish Meal
Diet
18 months - 400 g
reproduction
Spawning
Tanks - Cages
Intensive fattening farms
Eggs 300 000/m3
7-10 days
Yolk sac fry
Larva
Fish Meal
Diet
Juvenile
75 days, 1.5-2.5 g

Production systems

- Although seabass are farmed in seawater ponds and lagoons, the bulk of production comes from sea cage farming.

Extensive lagoon systems

- The traditional extensive method of lagoon management places special barriers in appropriate lagoon sites to capture fish during their autumn migration to the open sea. Barriers made of reeds, nets or cement stay open from February until May for the lagoon to be naturally stocked with fry. In this system seabass is usually cultured in polyculture with seabream, mullets and eels. Seabass reach a commercial size of 400-500 g in 37 months, with a total lagoon production of 50-150 kg/ha/yr. The limiting factor is in the natural feeding behaviour of the seabass that, as predators, may drastically reduce the natural resources of the lagoon ecosystem.

- **Semi-intensive lagoon systems**
- These techniques involve artificial enrichment with fry, fertilization of the lagoons, and improvement projects. Specialist fishermen collect fry from coastal waters during May and June; then fry are transported in oxygenated tanks for a first stage of growing in special ponds, until they reach a size which enables them to survive in the lagoon. Projects for improved productivity involve the development of sufficient canals and making new openings to the open sea for water exchange and enrichment with plankton and fry. Peripheral ditches (with fresh or seawater) are dug for salinity control, and also wintering ditches at least 2 m deep in several areas of the lagoon. Finally, vegetation control is important in order to avoid suffocation of the fish. Losses in fish production in the lagoons are due to insufficient enrichment with fry, predation, decreased freshwater supply (due to lack of rain), and lack of sufficient improvement projects. The production is higher than in the extensive system and amounts to 500-700 kg/ha/yr.

Hatchery production

- *Broodstock*

To secure a reliable and sufficient supply of good quality fish eggs, most hatcheries have established their own broodstock units, where breeders of different age groups are maintained long-term. Parent may come either from a farm or from the wild. The optimal age for female parent fish is between 5 and 8 years, whereas for males this range is lowered to 2-4 years. The management of captive broodstock in the breeding stations includes natural maturation, the induction of ovulation by photoperiod manipulation or hormonal treatments, fertilisation in spawning tanks and incubation in an open-water circulation system.

- *Spawning*

At the onset of the spawning season it is necessary to move selected batches of breeders from their long term holding facilities to the spawning tanks, where they can be better treated and their performance can be easily monitored. The male:female ratio in the spawning tanks is kept at 2:1. Whereas males are chosen when they release sperm spontaneously or on stripping, the female maturation stage has to be ascertained by extracting oocytes from the ovary with the use of a catheter: only females with oocytes in the late-vitellogenic stage, i.e. with a diameter larger than 650 µm are selected.

- *Photoperiod manipulation*

When fertilised eggs are required outside the natural spawning period, out-of-season sexual maturation is obtained by promoting gametogenesis by manipulating the photoperiod and temperature. The hatchery management decides on the periods of egg production according to its marketing and/or farm needs.

Hormonal treatment

Hormonal treatment is used to trigger the last phase of egg maturation. The human chorionic gonadotropin (HCG) is used at a dosage of 800-1000 IU per kg/bw, delivered in two injections in the dorsal muscles, 6 hours apart.