

Terms of aquaculture (growth, production and hatchery)

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Biomass

Weight of fish (weight)

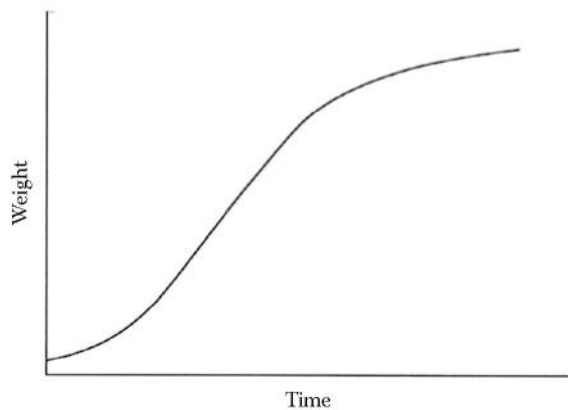
Standing crop/stock

Weight of fish in any aquatic ecosystem at a given time (weight/unit area or volume)

Carrying capacity

Maximum biomass of fish sustained in a specific system under a given set of environmental conditions

Fish biomass at the CC is balanced with the environment in terms of space, nutrition available and water quality



Fish growth- individual fish

Sigmoid growth of fish may be divided into 3 stages:

1. Slow rate because the body weight is small
2. Fast rate because the body weight has increased
3. Slow rate because the fish is aged

Fish growth- populations

Population growth is again sigmoid with 3 stages:

1. Slow because the biomass is small
2. Fast because the biomass has increased
3. Slow because the population is approaching the CC

Maximizing biomass:

- Avoiding the two slow phases and take advantage of the fast growth phase
- The first slow phase is due to low biomass; there is also underutilization of space and food; therefore, stock smaller fish at higher density (Nursery) or stock larger fish at lower density (grow-out)
- The second slow phase is due to the environmental limitations imposed by the CC

Growth parameters

1. Initial weight (g) = Weight of fish at stock
2. Final weight (g) = Weight of fish at harvest
3. Total weight gain (g) = Mean final weight (g) – Mean initial weight (g)
4. Specific Growth Rate (SGR %, bwd^{-1}) = $\frac{L_n \text{ final weight} - L_n \text{ initial weight}}{\text{Culture period}} \times 100$
5. Survival rate (%) = $\frac{\text{No. of fish harvested}}{\text{No. of fish stocked}} \times 100$
6. Fish yield (kg) = Fish biomass at harvest – Fish biomass at stock

Harvest and productions are not technical terms = Fish removed from the system

Fish seed

- Are small fish used to stock in aquatic systems
- There are advantages and disadvantages of both wild and hatchery seeds

Fish seed schema

Egg > larvae > Hatchling > Fry > Fingerling

- Eggs hatch to produce larvae which have yolk sacs
- Once the yolk sac has been absorbed they are called hatchlings
- Once they start to feed on zooplankton they are known as fry
- Once fry are above 2 cm they are called fingerlings

Hatchery

- It is a place where fish seed can be produced under controlled conditions
- There are both merits and demerits of hatchery produced fish seeds

Nursery

- A nursery can be a part of hatchery or a stand-alone enterprise
- Hatchlings or fry are raised carefully at high densities until they are large enough to be stocked
- There is a need to provide: food; and protection from disease and predators