

# Aquaculture nomenclature

## *Production management*

**Biomass:** a number of organisms, represented the total of their weight (Kg, lbs). Biomass is commonly used in aquaculture to give a simple idea of the amount of aquatic animals in a farm or a tank.

Example: the total biomass of fish harvested is of 400 kg.

**Stocking density:** a measure of the crowding of aquatic animals in a tank or basin. The stocking density is found by dividing the biomass by the total volume of the rearing tank or basin. Stocking densities are a useful measure of the intensity of an aquaculture operation and are a common animal welfare benchmark.

*Example1: : a water tank has 400 cubic meters and is holding a biomass of 12.000 kilograms. What is the stocking density? A:  $12.000\text{Kg} / 400\text{m}^3 = 30\text{Kg}/\text{m}^3$*

*Example 2: The stocking density achievable in commercial aquaponic systems with tilapia is 60 Kg/m<sup>3</sup> using tanks with aeration. What is the tank volume needed to support 10 tons of biomass under these conditions? A:  $10.000\text{ Kg} / 60\text{Kg}/\text{m}^3$*

**Specific growth rate (SGR):** a term used to describe the growth of aquatic animals over a period of time. The SGR is calculated as  $(\text{Ln weight at harvest} - \text{Ln weight at stocking}) / \text{production period} * 100$

*Example: determine the SGR of a tilapia which has grown from 5 grams to 400 grams in 20 weeks. A:  $(\text{Ln}400\text{g} - \text{Ln}5\text{g}) / (20\text{weeks} * 7\text{days}/\text{week}) * 100 = ((5.99\text{g} - 1.6\text{g})/140\text{ days}) * 100 = 3\% \text{ per day}$*

**Feed rate:** a measure used in aquaculture to indicate the amount of feed fed to a given biomass of fish per day. The rate is generally expressed as a percentage of the total biomass per day.

**Harvest size:** the size of a fish under production when its ready to go to market. Harvest sizes are determined ultimately by the market, which can include the end consumers, re-sellers or fish processors.

## *Water quality*

**Dissolved oxygen (DO):** refers to the amount of oxygen present in the water. Dissolved oxygen is generally expressed in milligrams per litre (mg/l) or in a percentage of the total oxygen saturation that can be achieved in a body of water of certain temperature and salinity. Other gases in dissolution (carbon dioxide, nitrogen) can be expressed in similar way

**Ammonia:** ammonia refers to two chemical substances that are present in the water ( $\text{NH}_3$ , un-ionized and  $\text{NH}_4^+$ , ionized) being the first, the toxic one to fish. The sum of these two substances gives the TAN, or total

ammonia nitrogen. The proportion of un-ionized and ionized ammonia in TAN is dependent of pH, temperature and salinity.

Nitrite: ( $\text{NO}_2$ ): nitrite is a chemical substance appearing in intensive aquaculture system as an intermediary step in the oxidation of Ammonia to nitrate in a biochemical process known as nitrification. Nitrite is toxic to fish and is a parameter to control in intensive system that make use of nitrifying biofilters

Nitrate ( $\text{NO}_3$ ): nitrate is a chemical substance that appears at the end of the nitrification reaction. Nitrate is relatively non-toxic to fish and can be allowed to accumulate in the water to high concentrations. In intensive systems, nitrate can be control by dilution (water exchanges) or by using denitrification reactors.

pH: is a numeric scale to represent the basicity or acidity of water. In Aquaculture, pH is important because it drives the proportion of toxic ammonia in the and the amount of dissolved carbon dioxide in the rearing water. Consult literature on the carbonate system for more information.

Alkalinity: also known as total hardness, is the capacity of the water the resist changes in pH. In aquaculture this term is generally expressed in mg/l of  $\text{CaCO}_3$ . Controlling alkalinity is especially important in aquaculture systems with nitrifying biofilters, because the nitrification process tends to acidify the water.

## *Fish*

Broodstock: parent fish, specifically reared to produce eggs which will later be used to produce fish at the farm

Seed: generally, refers to the first animal input in a farm. Depending on the farm, seed may mean eggs, fertilised eggs, fish larvae or fish fry.

Larvae: fish larvae are recently-hatched fish which have not finished their development into miniature versions of adult fish.

Fry: small fish that have recently came out of the larval phase and are smaller than a two or three months-old fingerling (see below)

Fingerling: generally, refers to fish which are few months old and, as their name suggests they tend to be the size of human fingers. These definitions are rather arbitrary, but serve as a common reference between fish farmers.

Mort: refers to fish that have died during the farming process. The terms is a contraction of the word "mortality" which is used interchangeably.