




Live food production


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- ❖ Live food means all living organisms from zooplankton and phytoplankton
 - ❖ Phytoplanktons are generally eaten by zooplankton. Thus, phytoplankton forms the basis of the food chain
 - ❖ the form of existence and discovery of live food in fish farming operations is an important turning point in transferring fish farming to wider horizons

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- ❖ after experts were able to hatch fish, especially marine ones and some crustaceans such as shrimp, without the presence of live food, the process of raising and growing small larvae will not take place in the early stages of the life cycle.
 - ❖ In the fact, all marine plankton, whether animal or plant, are present in marine and can be collected by means of fine nets,
 - ❖ but these organisms are not safe and have caused the transmission of diseases, in addition to the fact that the quantities collected are not sufficient and will not suffice to feed the fish larvae during the first period, which in some fish extends to 20 day .

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- ❖ Hence, the trend was to develop systems for breeding and producing live food in large quantities sufficient to operate marine fish hatcheries on a commercial scale.
 - ❖ Live feeds remain essential in hatcheries for many aquaculture species
 - ❖ **The importance of live food;** whether animal or plants, is concentrated in its infinitely small size, which matches the size of the mouth of fish larvae in its early stages,.

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- ❖ as well as Live food organisms contain all the nutrients such as essential proteins, lipids, carbohydrates, vitamins, minerals, amino acids, and fatty acids, hence are commonly known as “living capsules of nutrition”
 - ❖ **Types of live food;** microalgae, rotifers, *Artemia*, copepods, as well as yeasts, bacteria

❖ Microbes;

❖ Yeast can be directly used as a primary food source for many larvae but it is mainly used as a feed for zooplankton which is grown for use in larviculture

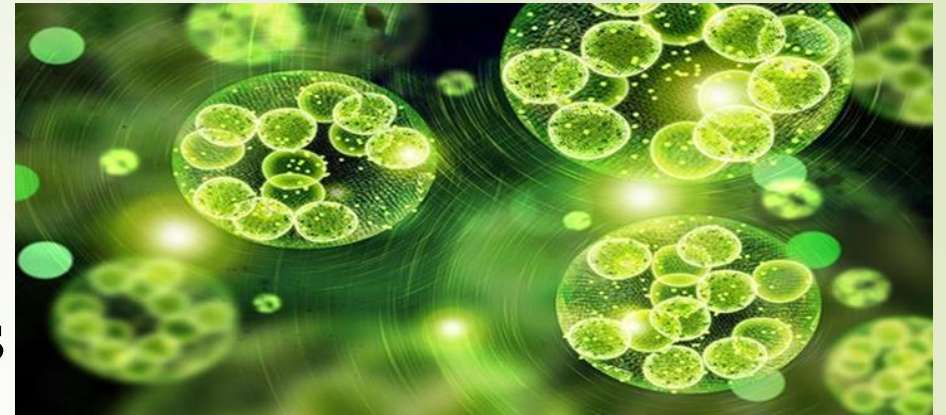
❖ Today commercial preparations of useful bacteria like *Bacillus subtilis* are available in ready-to-use packs

❖ Yeast has also been evaluated as a supplement or replacement for algae in the feeding of post-larval penaeid shrimps.



❖ Microalgae;

❖ Algae are chlorophyll-bearing unicellular or multicellular plants



❖ algae are further classified into three divisions as Chlorophyta (green algae), Phaeophyta (brown algae), and Rhodophyta (red algae).

❖ Chlorophyta (green algae) serve as initial food producers and the first link in the aquatic food chain, both in freshwater and marine ecosystems.

❖ The use of microalgae as a possible source of protein food was recognized by their searchers in the mid 20th century.

❖ Artemia;

❖ Normally 2,00,000 to 3,00,000

Artemia are hatched from each gram of high-quality cysts

❖ The biggest advantage of using Artemis is that one can produce live food on demand from dry and storable powder i.e. dormant Artemia cysts which upon immersion in seawater regain their metabolic activity and within 24 hours, release free-swimming larvae (nauplii) of about 0.4 mm length



❖ Rotifers;

- ❖ The most famous zooplankton that is used as live food in fish hatcheries and it is not possible to produce fish larvae without their presence is the Rotifer, especially the type *Brachionus*, where there are several types of them under this genus with different sizes from 80 mM to 350 Mm This difference in sizes made their use according to the mouth opening of some fish, while the mouth opening is small in fish such as Grouper, it is larger in other species such as Seabass for example


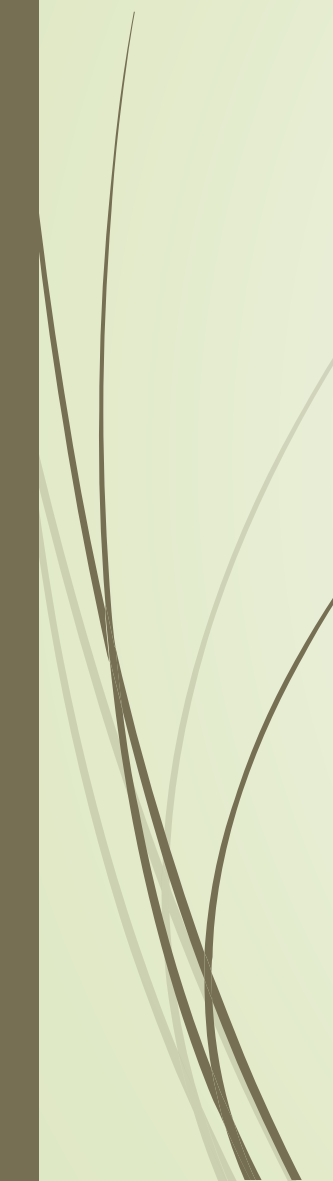



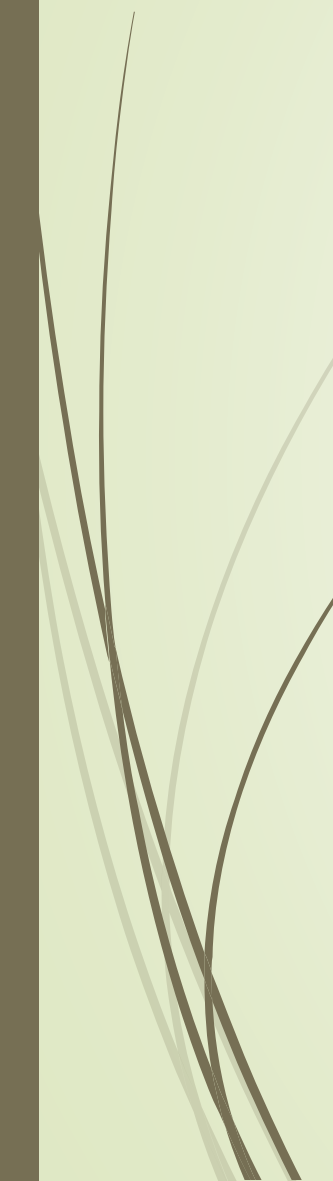


Brachionus plicatilis



Brachionus rotundiformis

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- ❖ The most widely used type in the world, which we use in the center of fish farms, is the type *Brachionus plicatilis*, which is the largest type, which is called L-Type, which has an average volume of 200–350 ml microns.
 - ❖ The second type is *Brachionus rotundiformis*, the smaller type S-Type, which has an average size of 150 ml micron to 200 ml micron.
 - ❖ Another type of the same type was discovered, the sizes smaller than it, where they are isolated, which is called SS-Type, which average size from 70 mm micron to 160 mm micron.

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- ❖ The small size of the rotifer, its circular shape and slow movement, as well as the possibility of breeding and producing it on an intensive scale made it The most important types of live animal food used in fish farming in the world.
 - ❖ All of it can be produced easily in the process of producing live food using two-stage breeding indoor production.
 - ❖ In indoor, there is a laboratory in which the low temperature is controlled as well as pollution is prevented by following means of sterilization and general hygiene.
 - ❖ The culture operations start from the smaller tubes and then Gradually throw it into the beaker to the larger tanks, then the cylinders to the outer tanks, depending on the use of approved fertilizers.



Medium and large volumes cultivated in the same room



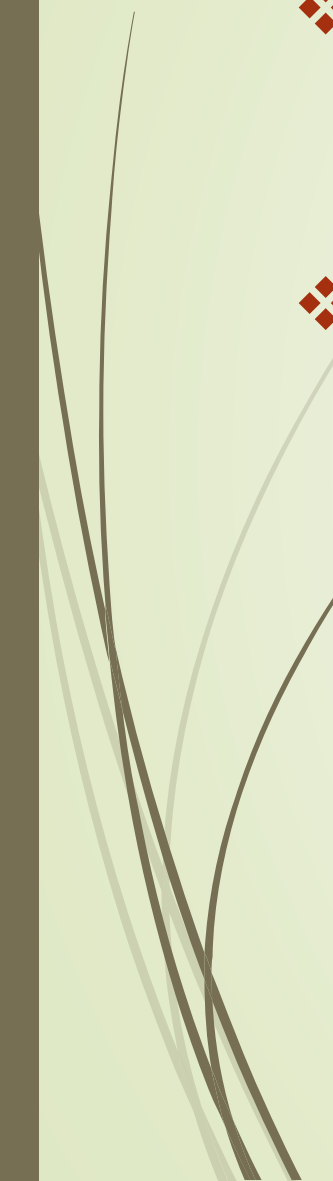
Large rotifers tanks for mass culture.



Mature algae bags ready to be inoculate with rotifers



❖ Harvesting/concentration of rotifers

- ❖ Small-scale harvesting of rotifers is usually performed by siphoning the content of the culture tank into filter bags with a mesh size of 50–70 μm
 - ❖ If this is not performed in submerged filters the rotifers may be damaged and result in mortality
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The End