

Ecological Pyramids

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Trophic Pyramids

Food chains represent living organisms living in a community. [Ecological pyramids](#) are the graphical representation of the food chain. They also depict the relationship between the organisms of the ecosystem. So let's define ecological pyramids as:

“An ecological pyramid is a graphical representation of a specific parameter (such as number, biomass or energy) of a food chain.”

Various levels are depicted in the ecological pyramids. The producer level occupies the base of the pyramid. And as the trophic levels increase, the pyramid goes on tapering upwards. The [carnivores](#) are on top of the pyramid. A top predator is present in the top of all.

Types of Pyramids

- Pyramid of number - On the basis of the number of organisms at each level.
- Pyramid of biomass - On the basis of biomass of all the organisms at each trophic level.
- Pyramid of energy - On the basis of the energy contained in all the organisms at each trophic level.

Pyramid of Numbers

It is constructed on the basis of the number of organisms at each trophic level in the food chain.

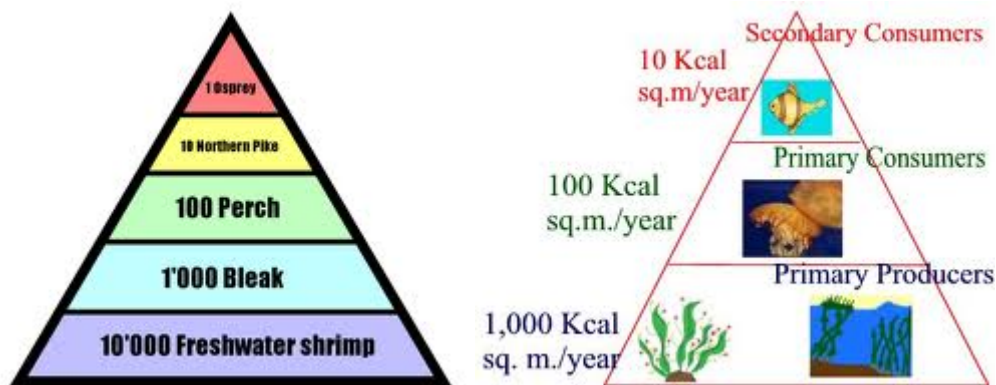
In this food chain, the number of animals decreases at successive [trophic levels](#). Green plants (the autotrophs) occupy the bottom level. Just above the plants are herbivores which depend on plants for food. The animals in this lowest level of the pyramid are large in number. But at the successive higher levels of the pyramid, the number of animals starts to decrease. The top carnivores at the top of the pyramid are very few. For example, in a forest there may be a large number of deer or giraffe, but there will be only a few lions or tigers.



Pyramid of Numbers

Pyramid of Biomass

The amount of living matter is known as biomass. A pyramid of biomass is constructed on the basis of mass of all organisms in each trophic level in the food chain. The total biomass of the producers is greater than the herbivores. In a food chain only 10% of the biomass is transferred from one level to the next level in the food chain.



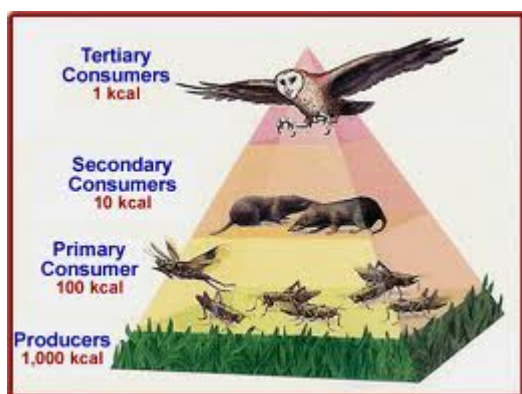
Pyramid of Biomass showing the 10% biomass transfer between levels

Pyramid of Energy

It is constructed on the basis of [total energy](#) present in all the organisms of each trophic level of the food chain. The amount of energy decreases at each trophic level in a food chain because at each step heat is released. Plants have more chemical energy when compared to herbivores.

10 % Law

Only 10 per cent of the chemical energy of previous level is retained by the next trophic level. 1000 Kcal of energy is stored in plants. Herbivores – primary consumers feeding upon them would retain 100 kcal (10% of 1000Kcal) of energy. Carnivores – the secondary consumers feeding on herbivores would gain 10 kcal (10% of 100kcal) of usable energy. And the tertiary consumer – the top carnivore would gain 1kcal (10% of 10kcal). This is illustrated here in this picture.



Pyramid of Energy showing 10% Law

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Reference Links:

- http://en.wikipedia.org/wiki/Ecological_pyramid
- http://www.ehow.com/list_6068772_types-ecological-pyramids.html

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