

Significance of food chain:

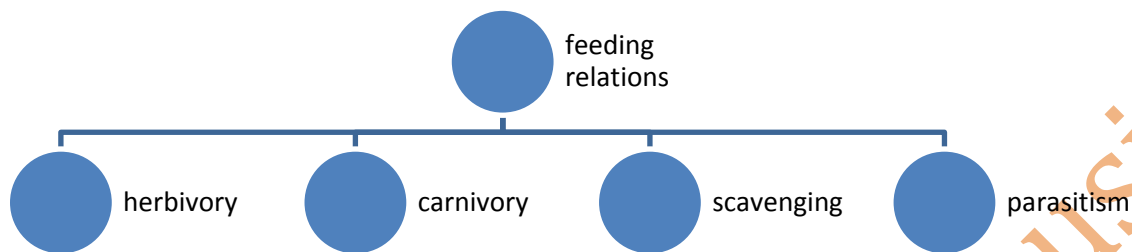
1. The studies of food chain help us to understand the feeding relationships and the interaction between organisms in any ecosystem.
2. They also help us to appreciate the energy flow mechanism and matter circulation in ecosystem and understand the movement of toxic substances in the ecosystem.
3. The study of food chain helps us to understand the problems of [bio-magnification](#).

Food web:

A food web differs from a food chain, because of the complex network of [different animals](#) and feeding relations are aggregated while the chain only follows a direct, linear pathway of [one animal at a time](#).

[Food web](#) (or **food cycle**) is the natural interconnection of [food chains](#) and generally a graphical representation (usually an image) of what-eats-what in an [ecological community](#).

There are different kinds of feeding relations that can be roughly divided into [herbivory](#), [carnivory](#), [scavenging](#) and [parasitism](#).



Energy flow in food chain

In [ecology](#), **energy flow**, also called the **calorific flow**, refers to the flow of [energy](#) through a [food chain](#).

A general energy flow scenario follows:

- 1) [Solar energy](#) is fixed by the [photoautotrophs](#), called primary producers, like green [plants](#).
- 2) [Primary consumers](#) absorb most of the stored energy in the plant through [digestion](#), and transform it into the form of energy they need, such as [adenosine triphosphate](#) (ATP), through [respiration](#). A part of the energy received by primary consumers, [herbivores](#), is converted

to [body heat](#) (an effect of respiration), which is radiated away and lost from the system. Energy loss also occurs in the expulsion of undigested food (egesta) by excretion or regurgitation.

3) Secondary consumers, [carnivores](#), then consume the primary consumers, although [omnivores](#) also consume primary producers. Energy that had been used by the primary consumers for growth and storage is thus absorbed into the secondary consumers through the process of digestion.

4) Tertiary consumers, which may or may not be [apex predators](#), then consume the secondary consumers, with some energy passed on and some lost, as with the lower levels of the food chain.

5) The final link in the food chain is [decomposers](#) which break down the [organic matter](#) of the tertiary consumers (or whichever consumer is at the top of the chain) and release [nutrients](#) into the [soil](#).

The energy is passed on from [trophic level](#) to trophic level and each time about 90% of the energy is lost, with some being lost as heat into the environment (an effect of [respiration](#)) and some being lost as incompletely digested food (egesta).

Therefore, primary consumers get about 10% of the energy produced by autotrophs, while secondary consumers get 1% and tertiary consumers

get 0.1%. This means the top consumer of a [food chain](#) receives the least energy, as a lot of the food chain's energy has been lost between trophic levels. This loss of energy at each level limits typical food chains to only four to six links.

Prof. Dr. Usamah H. Yousif