

TCE *Techniques of Communication and Expression*

University of Jijel

Level: 1st Year Biology

Chapter III. Text analysis and comprehension

Topic 1. Food chain

A food chain is a linear trophic pathway that describes the transfer of energy and matter from one organism to another within an ecosystem. It represents the feeding relationships between organisms and illustrates how energy flows from primary producers to successive levels of consumers and ultimately to decomposers.

The food chain begins with primary producers, also known as autotrophs, which synthesize organic compounds from inorganic substances through photosynthesis or chemosynthesis. In terrestrial ecosystems, these are mainly green plants, while in aquatic ecosystems; phytoplankton and algae serve as primary producers. These organisms convert solar energy into chemical energy stored in carbohydrates.

The second trophic level consists of primary consumers (herbivores), which feed directly on producers. Examples include insects, zooplankton, and grazing mammals. The third trophic level comprises secondary consumers, which are carnivores that feed on herbivores. Higher trophic levels may include tertiary consumers or apex predators, which occupy the top of the food chain and typically have no natural predators.

Energy transfer between trophic levels is inefficient. According to the ecological "10% rule," only approximately 10% of the energy at one trophic level is transferred to the next level, while the remainder is lost as heat through metabolic processes. This energy loss limits the number of trophic levels within an ecosystem.

Finally, decomposers, such as bacteria and fungi, play a crucial role in breaking down dead organic matter and recycling nutrients back into the environment. Although often not represented as a distinct trophic level in simple food chain diagrams, decomposers are essential for maintaining ecosystem stability.

Food chains are interconnected and form complex networks known as food webs, which more accurately represent ecological interactions in natural systems.

Questions, critical analysis, and writing skills

1. What is a food chain?
2. What are primary producers and why are they important?
3. What is the difference between primary and secondary consumers?
4. Why is energy transfer between trophic levels inefficient?
5. What is the ecological 10% rule?
6. What are the trophic levels? Give an example for each level.
7. Give the definition of the terms below:

Food chain, food web, producer, consumer, primary consumer, secondary consumer, decomposer, autotroph, heterotroph, apex predator, biomass, energy pyramid, nutrient cycling.

8. Put the food chains in the correct order and determine the trophic level of each.

A/

B/



9. Complete the blanks using the appropriate words from the list below:

Herbivores; photosynthesis; soil; primary; secondary/tertiary; omnivores; multiple; one; carnivores; autotrophs; decomposers; heat.

- , such as algae, convert sunlight into chemical energy through.....
- consume plants and serve as consumers in the food chain.
- feed on herbivores and are considered consumers.
- , like bears, occupy levels because they eat both plants and animals.
- recycle nutrients from dead organisms back into the , maintaining ecosystem productivity.
- Energy flows indirection, with some lost as at each level.

10. What happens if a link in the food chain disappears?

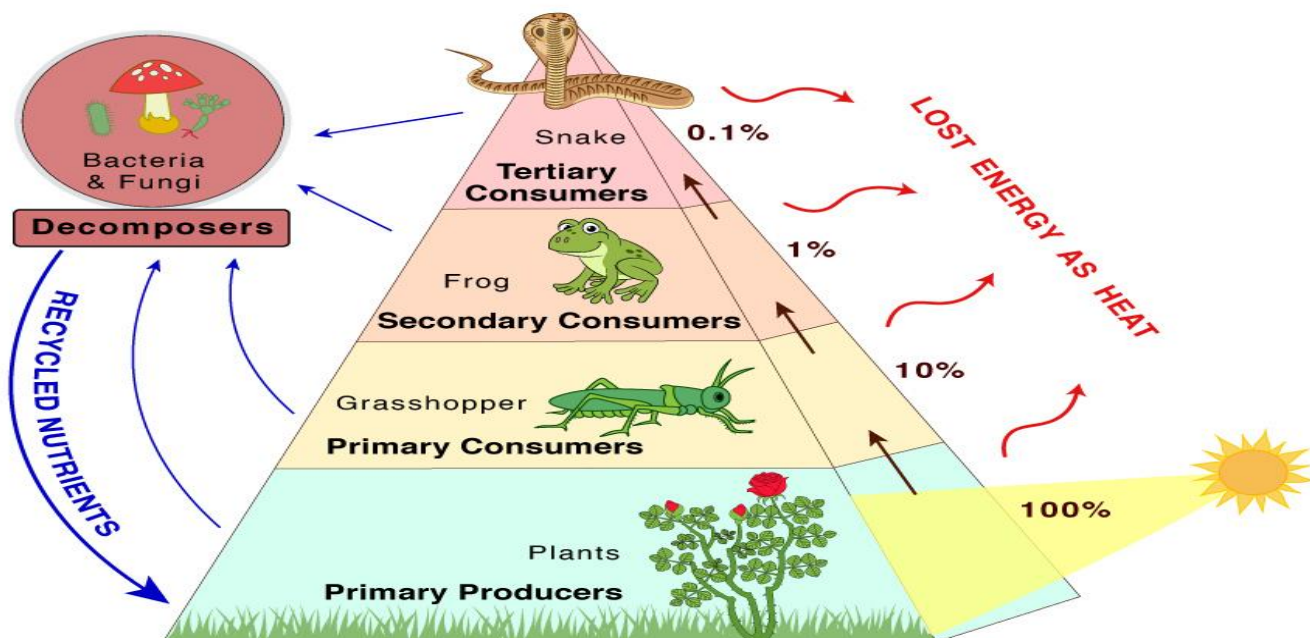
11. What is the role of decomposers in the food chain?

12. How does the presence of multiple food chains in a food web increase the stability of an ecosystem?

13. Write a brief paragraph describing this energy pyramid.

Energy Pyramid

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