



PFAS in Food Chains and Food Webs

Pollution in the environment can make it harder for organisms to grow. One example of pollution is a group of toxic chemicals called **PFAS**. These manmade chemicals have been produced since the 1940s. PFAS do not break down in the environment, which is why they are sometimes called “forever chemicals”. Unfortunately, PFAS contamination is found in many places around the world. PFAS contamination can occur in many ways. Two examples are chemical spills and using certain fire-fighting foams that contain PFAS.

Researchers have been studying how PFAS pollution affects different parts of an ecosystem. One way they do this is to measure the growth of organisms exposed to different amounts of PFAS. These amounts are measured in "parts per million" or "ppm." One ppm is about 1 drop per 10 gallons of water. One group of scientists decided to study how PFAS contamination affects the growth of algae. These plant-like organisms are primary producers in freshwater food webs. The scientists found that PFAS levels around 120 ppm reduce algal growth by 50%. The researchers think that this is because PFAS weakens the algae’s cell membranes.

Think back to the food web activity you did. Similar versions of the food web you constructed also occur in lakes and ponds. Consumers in freshwater food webs include snails, frogs, fish, and sometimes even alligators.

1. If a chemical spill occurred, and a pond with algae in it was contaminated with PFAS, how do you think that would affect the ability of the algae to grow?
2. If there is more or less algae in the pond, how would that affect the primary consumers (e.g. bugs and small fish) that eat the algae?
3. How would that then affect secondary consumers like frogs and larger fish?

Scientific Reference:

Liu W, Chen S, Quan X, Jin YH. Toxic effect of serial perfluorosulfonic and perfluorocarboxylic acids on the membrane system of a freshwater alga measured by flow cytometry. *Environmental Toxicology and Chemistry: An International Journal*. 2008 Jul;27(7):1597-604.

Local Examples:

[PFAS Present Throughout the Yadkin-Pee Dee River Food Chain | NC State News \(ncsu.edu\)](#)

[NC alligators found to have autoimmune response to PFAS chemicals \(fayobserver.com\)](#)

Additional Resources:

www.niehs.nih.gov/research/supported/exposure/pfas/index.cfm

<https://www.epa.gov/pfas>