

environment, it enters the bodies of animals that are low in the food chain. At each stage of the food chain, the pesticide concentration becomes greater. The higher the trophic level, the greater the concentration of toxins or poisons. This process is called **bioaccumulation** (Figure 3).

- (c) Vultures and some types of beetles feed on the dead bodies of animals from several trophic levels. What is the effect of bioaccumulation on these animals?

## Effect on Humans

Like other top predators, humans are affected by bioaccumulation. Studies from the 1950s show that DDT levels were high in humans who lived where crops were sprayed. Anyone who ate crops or animals from the sprayed areas was also exposed to DDT. Although DDT has been banned in Canada and the United States since the early 1970s, migratory birds and fish still show signs that the problem has not been eliminated.

- (d) Why should Canadians be concerned that other countries have not banned DDT?

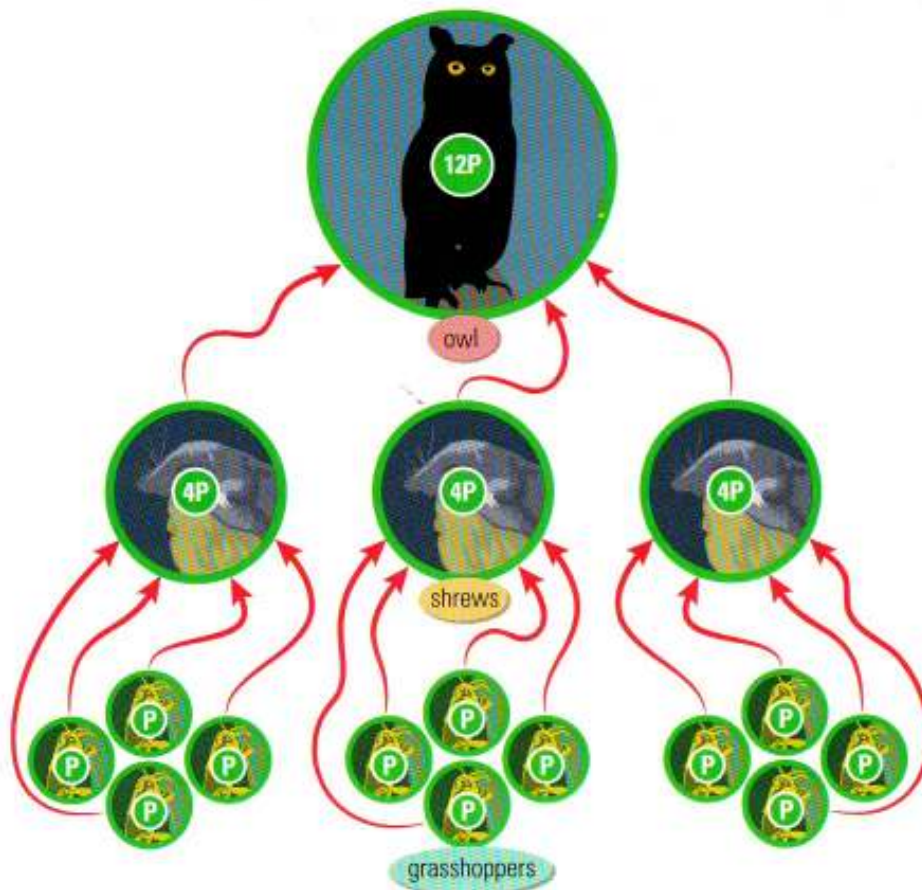
- (e) Breast milk contains fat. How could breastfeeding affect the concentration of DDT in a mother and in her baby?

## New, Improved Pesticides

Modern pesticides are not stored in fat tissue; they are soluble in water. These chemicals act like nerve gas, affecting breathing or muscle activity, killing the pest or making it easy prey for predators.

Although safer than older chemicals, there are problems with modern pesticides:

- They break down quickly in the soil and must be applied more often.
  - They do not target a single organism and may affect any organism in the food web.
  - Bioaccumulation can occur when other organisms eat dead insects.
  - Continued application allows insects to gradually become resistant to the pesticide.
- (f) Why are the new pesticides less harmful to ecosystems than DDT?



**Figure 3**

Bioaccumulation. The concentration of a fat-soluble pesticide (P) increases as you move up a food chain.