

Preview Material for Exam 2 - Fall 2003

Free-range chickens, such as the ones in Dr. Hamilton's yard, feed on a variety of things besides store-bought feed. Diet items include grass shoots, insects of all kinds, fruit and vegetable scraps thrown into the compost pile, and even small snakes. One of their favorite places to search for food is in the leaf-litter under the numerous oak trees in the yard and they like to pick grasshoppers off of the plants in the garden. Also, they are particularly fond of ripe tomatoes.

The leaf litter that the chickens scratch around in to find food items contains numerous types of organisms - insects, worms, fungi, bacteria, and plant roots - some of these the chickens will eat, some they won't. Researchers estimate that one-third of the carbon dioxide released to the atmosphere from soil comes from the top layer, the leaf litter.

Maculotoxin is venom produced by a species of aerobic bacteria found in the salivary glands of the blue ringed octopus. This potent toxin was poisonous to the ancestral species of blue ringed octopus. Today the blue ringed octopus is insensitive to the toxin. Animal victims of the blue ringed octopus are **paralyzed** and often fully conscious as the octopus consumes them. Humans can also be harmed by this neurotoxin, but only when they disturb or step on one of these octopi.

Mrs. Willet has a history of heart problems and poor circulation, so her doctor prescribed a drug (diuretic) to remove the fluids accumulating in her lungs and other tissues. He warns her that the diuretic will deplete her blood of potassium and recommends that she take potassium supplements. After she runs out of the potassium (K^+) supplements and forgets to buy more, her husband finds Mrs. Willet passed out on the kitchen floor.

Clostridium tetani is a bacterium. Its spores remain viable in human and animal feces and soils for years. Spores enter hosts (humans, horses) through deep penetrating wounds. As the bacteria grow and multiply in the damaged tissues, they produce a neurotoxin called tetanospasmin and symptoms develop rapidly. Symptoms include rigidity of abdominal muscles and jaw muscles (hence the common name: lock jaw). Death occurs from respiratory failure due to muscle paralysis.

Jimsonweed (*Datura stramonium*) contains tropane alkaloids including atropine and related compounds that cause serious intoxication and even death. Though all parts of the plant are toxic, the greatest concentrations of tropanes accumulate in the

seeds. Some of the symptoms of jimsonweed consumption are extreme pupil dilation, flushing red skin, slurred speech, decreased bowel movement and hallucinations. Many poisonings and deaths have occurred among adolescents looking for a "high" who were not aware of these potential life threatening effects