

Fall 2007 ~ Exam 1 Preview Material

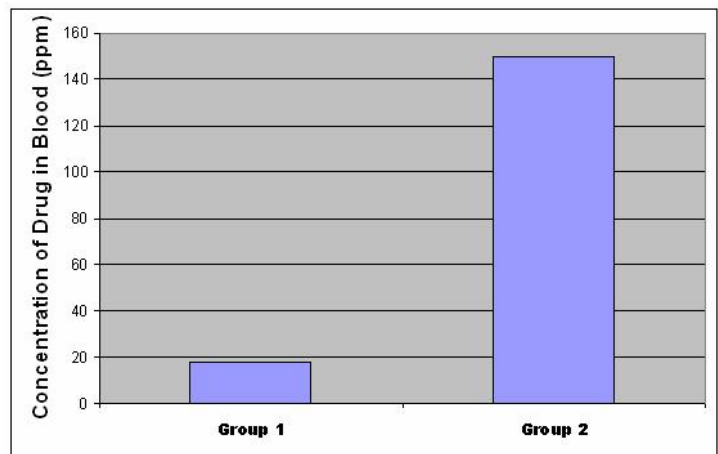
Use a #2 pencil to fill in the information on your NCS answer sheet. Put your **OKEY ID** in the boxes indicated for **LAST NAME** and darken the appropriate circles. Write your Name (Last,First) and “**Star**” or “**No Star**” in the space above the boxes containing your **OKEY ID** (depending on the form you have). Darken the **(S)** or **(N)** in the last column of the name circles. Enter the number **731** and darken the corresponding circles in the first 3 columns of the “**Student ID.**” Failure to perform this correctly will incur a **-10pt handling fee**. Read all questions and answers *carefully* before choosing the **single BEST response** for each question. Feel free to ask the instructor for clarification.

Tomatoes are frequently harvested before they are completely ripe and red. According to market needs, the ripening process can be regulated by adjusting the environmental temperature and by applying a plant hormone that facilitates the ripening process. Many enzymes participate in the ripening process. Tomatoes are indigenous to the New World. They were not accepted easily by the Europeans because many relatives of the tomatoes in Europe produce toxic compounds that may be lethal for humans and animals.

Felix the cat lives with his owner and another pet, Oscar the iguana (a reptile). When indoors, Felix enjoys napping under his owner’s wood-burning stove, which sits on legs. During one winter, with the aid of a high calorie diet from his owner, Felix gained considerable weight. Like all mammals, Felix has more bacterial cells within his body than his own cells! Many of the bacteria within Felix’s large intestine are anaerobic (*i.e.*, they thrive without oxygen).

From 1970-80, it was observed that workers in an azo dye manufactory factory had a higher incidence of colon cancer than the general public. Nearly 10% of the factory workers were diagnosed with colon cancer over that time period. It was hypothesized that azo dye may serve as a carbon source for bacteria that live in humans’ intestines.

We have enzymes that breakdown medication in our intestine before the medicine is absorbed. Medical doctors and pharmacists discovered this process is sometimes altered in people that consume grapefruits. Grapefruits contain certain compounds called furanocoumarins that can alter how much some cholesterol-lowering drugs enter the blood. To test these effects, a group of researchers measured drug absorption for 100 volunteer patients. Research subjects were already taking the cholesterol-lowering drug prescribed by their doctor and randomly assigned to one of two groups. Half of the patients were asked to avoid foods with grapefruit (Group 1) and the other half were asked to consume 200mL grapefruit juice per day (Group 2). The following graph shows the results (averaged).



A pet food production company boasts their new food “Kitten Yum Yums” leads to the fastest weight gain for kittens (ages 6-12 weeks). An independent consumer group designed an experiment to test this claim. They provided several different food brands to pet owners with specific daily feeding instructions. They recorded the reported weight gain of the kittens over the six week period. All of the kittens in the study were 6 weeks old at the beginning of the study and of the same breed.

Physiologists have learned there are several groups of fishes that have the ability to produce and conserve internal heat to slightly elevate the temperatures of certain tissues, as if they were endotherms. Such groups include the tuna, billfishes, some elasmobranchs (sharks, skates, and rays), and a species of mackerel. Heat production occurs when a specific protein (UCP1) allows some protons (H^+) to pass back through the inner-mitochondrial membrane into the matrix without passing through ATP synthase. This process, which is referred to as non-shivering thermogenesis, occurs in brown fat tissue and is a method of heat production that is found in fish as well as other groups. These fish also appear to have vascular counter current heat exchangers.