

**Microbiology 2400
Study Guide #10
Winter Semester 2008
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LABORATORY SECTION

STANDARD PLATE COUNT—SOLID MATERIAL

Consult your class notes for information concerning these questions

1. There really are very few questions about this procedure in that you have already done a standard plate count. There are a few questions that are peculiar to plate counting starting with a solid material, in this case, hamburger.
2. What was done to the hamburger to render it countable using this technique?
3. In doing this work, one makes the assumption that 1g of hamburger is equal to ___ ml.

MEMBRANE FILTRATION

Note: you do have some information in your textbook concerning membrane filtration. Consult the index of your textbook for page numbers.

1. Membrane filters of the type that you utilized in this laboratory can be used for sterilization purposes. What is the principle behind this type of sterilization?
2. If you were using membrane filters to sterilize gases or fluids, what major group of microbes would pose the greatest challenge? Why?
3. You can also utilize membrane filters to obtain a “count” of microbes/ml of solution. It was noted in class that membrane filters could be used to obtain “counts” where the standard plate count approach cannot be used. What situation, of this type, was noted in class?

Sanicheck system

Note: There is no information concerning the Sanicheck system in your manual or textbook. You will need to refer to your class notes.

1. You should be able to describe how this system can be used to determine microbial numbers in a fluid.

2. You should be able to cite 2 advantages of this system over standard plate counting.
3. What would be 1 disadvantage of this system when compared to a standard plate count?

ANTIBIOTIC SENSITIVITY—DISK METHOD

1. You were introduced to 5 general mechanisms by which bacterial organisms can make use of to show antibiotic resistance. What were those methods?
2. It was noted that changes in the genetic information that bacteria have is responsible for the development of antibiotic resistance. Changes in existing bacterial genetic information are really what are called genetic _____. As part of a discussion of these, you were introduced to the so-called SOS system that some bacteria possess (E. coli as an example). This system, when operating, can lead to the production of a vastly elevated mutation rate for what reason?
3. Bacterial organisms can also become antibiotic resistant because of obtaining additional genetic information. You were introduced to 3 means by which that may happen. What were these methods? Which of the means involves viruses? Which involves cell to cell touching? Which one involves the uptake of genetic information from the environment of the cell?
4. If one looks at the various antimicrobial agents that are currently used to treat microbial infections in man, there are some 5 major “attack points” for these materials in the microbial cell. What are those points or areas?

LECTURE SECTION

1. One the most significant of “mother natures” chemostats is the rumen.
 - a. Briefly, what is a rumen?
 - b. You should be able to cite 2 examples of animals, which have rumens.
 - c. Rumen microbes have the ability to digest what wide-spread polysaccharide?
 - d. Generally speaking, the metabolism of the above mentioned polysaccharide via fermentation leads to the production of _____ acids which pass into the animal’s circulatory system and serve as the primary source of **energy** to run the organism. The above mentioned metabolism also leads to the production of the gas, _____ which leaves animal by the process of eructation or _____.
 - e. Since the rumen is also a structure in which microbes reproduce, excess microbial cells accumulate in the rumen. This activity should lead to the production of other nutrients for the animal. You should be able to cite 2 such groups.

- f. Ruminant animals have proven to be very useful to man. What is the basic reason for their usefulness to us?

Chapter 7

1. If an object, fluid, or gas is sterile, what does this imply?
2. As you should remember, some time was spent discussing the so-called 12D treatment given certain canned food products. This treatment is an attempt to insure that the produce is free of the bacterium, which causes what dangerous condition? You should be able to explain the logic behind the 12 D treatment protection.
3. A few comments were made concerning how one might try to insure that your sterilization attempts were in fact doing the “job” in a situation such as a hospital environment. What were the two approaches that I noted?
4. One of the major approaches to sterilizing materials involves the use of heat. In class, you were introduced to 3 general means by which heat can be used. What were these approaches?
5. Which of the above mentioned approaches do you use in laboratory when you sterilize your inoculating loops or needles?
6. Dry heat involves using some type of ____ (equipment name) to essentially bake your materials in order to sterilize them.
7. Moist heat can be used in several different ways. Probably the most common approach involves the use of steam under pressure. The device that is commonly employed in this approach is called the ____.
8. How do the temperatures and times required from dry heat sterilization compare to those involving moist heat sterilization?
9. You were introduced to the process of Tyndallization or fractional sterilization. What type of heat is used in the process? You should be able to describe what action the initial steaming has, the storage phase, and the resteamng process. This process has its uses when you are dealing with what types of objects or fluids?