

Carbohydrate tests essay sample



**ASSIGN
BUSTER**

For this experiment we will be testing four different bacteria with four different tests, using glucose, lactose, and sucrose. Hopefully we will use the information from those test to be able to identify the organisms in each of the samples from the case studies. We will use the results from the four different tests along with the information of how different bacteria react to match up to the case scenario and identify the bacteria, then check to see if our guess was correct. The findings are that we were able to identify, by process of elimination, the four different test bacteria.

PROCEDURE –

These procedures were followed for all four media test samples. Label test sample.

Record Case study and Gram Stain results.

For glucose testing:

Select red glucose broth with durem tube.

Inoculate red glucose media.

Incubate for 24 hours.

Record results.

For lactose testing:

Select red lactose broth.

Inoculate red lactose media.

Incubate for 24 hours.

Record results.

For sucrose testing:

Select red sucrose broth.

Inoculate red sucrose media.

Incubate for 24 hours.

Record results.

For Identifying the four organisms:

View identification matrix and elimination hierarchy.

Make an educated guess with information from case study.

Identify organism.

Verify and record the correct bacterium.

Test bacterium 1 – *Escherichia coli*

case study: A 4-year old girl was brought to the emergency room suffering from severe, watery diarrhea, lethargy, and nosebleeds. Emergency room personnel reported a fever of 101o F, blood pressure of 110/70, and heart rate of 72. Blood and stool samples were taken. Urine samples contained blood. The blood work revealed an acidic pH and abnormally low levels of platelets and erythrocytes. High levels of creatinine and urea were observed. This organism was cultured from various body fluids.

Gram stain results: gram negative rods.

Acid from glucose: positive.

Gas from glucose: positive.

Lactose fermentation: positive.

Sucrose fermentation: positive.

Test bacterium 2 – *Enterobacter aerogenes*

case study: Butch was given the assignment by his microbiology instructor to sample soils from a variety of habitats for microbes. This organism was isolated from soil he obtained at a local farm.

Gram stain results: gram negative rods.

Acid from glucose: positive.

Gas from glucose: positive.

Lactose fermentation: positive.

Sucrose fermentation: positive.

Test bacterium 3- *Salmonella typhi*

case study: A 31-year old graduate student from Peru visited the emergency room complaining of fever, headache, body aches, painful urination, and sore throat. Questioning by the emergency room personnel revealed he had returned less than two weeks ago from visiting home for the holidays and had been suffering from developing symptoms for at least six days. Their examination also revealed fever of 103o C, slow heartbeat, and a tender abdomen. He was admitted to the hospital for further tests. The next morning the fever and symptoms remained and clusters of small pink spots appeared on the chest and abdomen. The patient complained of severe exhaustion. Over the course of time, the fever dropped gradually and the symptoms subsided. This organism was cultured from blood, stool, sputum, and urine specimens.

Gram stain results: gram negative rods.

Acid from glucose: positive.

Gas from glucose: negative.

Lactose fermentation: negative.

Sucrose fermentation: negative.

Test bacterium 4 – *Proteus vulgaris*

case study: David washed his hands along with the others in his microbiology lab. Their exercise that day was comparing the effectiveness of two brands of soap. They had already pressed their fingertips onto the surface of their “before” nutrient agar plate and were now to repeat the process onto an “after” plate. This microbe was identified from colonies appearing on both plates.

Gram stain results: gram negative rods.

Acid from glucose: positive.

Gas from glucose: positive.

Lactose fermentation: negative.

Sucrose fermentation: positive.

DISCUSSION –

Carbohydrate testing utilizes the different ways that bacteria metabolize different sugars by inoculating different broths with the test bacteria and seeing if there is a change in acidity and/or if any gases are produced. For glucose testing, we would check to see if gas is produced and if the pH of the broth solution drops for a positive test result. For lactose, we check to see if the pH drops or becomes more acidic. For sucrose we check the same was as <https://assignbuster.com/carbohydrate-tests-essay-sample/>

for lactose but use a sucrose solution instead. A negative result would mean that the solution contained a base/alkali pH.

In order for the media to show the change in acidity the solutions are modified and include an indicator chemical. This indicator will change color depending on the pH level of the media it is in. For all the media used in this experiment, the indicator changes to a yellow color when in the presence of an acid and turns magenta/pink when in the presence of a base or alkali.

Growth can still be accomplished without metabolizing the sugar in the carbohydrate test medium by other means. The organism can use some other means of energy to promote growth or the growth can be a result of a different interaction with the test medium besides metabolizing the sugar within it.

CONCLUSION -

This experiment provided useful insight on the tools and procedures used in identifying unknown organisms based on the way they metabolize different sugars. We identified the four bacteria from the four case studies by using the process of elimination based on what would be the most likely from the information about them. Further study could be done about the metabolic product that resulted from the bacterium since all four could metabolize glucose but produced different results. But even though all four could metabolize glucose, not all four could metabolize lactose and sucrose because they are chemically different sugars. The organisms that lacked the ability to metabolize those sugars did not have the proper metabolic functions to facilitate it.