Annotate any questions or things of interest

6th grade Science

Bacteria: *Salmonella*

Food poisoning isn't caused by poison at all. Instead, what we call "food poisoning" is usually caused by bacteria, including *Salmonella*, a type of bacteria commonly found in chickens and other animals. *Salmonella* finds its way into our food and water and causes thousands of cases of food poisoning every year.

Environment

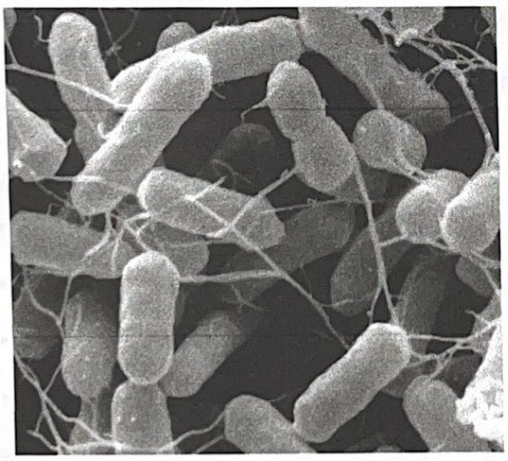
Salmonella lives in the guts of all kinds of animals, especially birds and reptiles, and usually gets passed around through animal waste. Whether a person gets sick from ingesting certain kinds of *Salmonella* can depend on the amount of food and space available in his or her gut microbiome. If the gut is home to lots of beneficial bacteria, the *Salmonella* bacteria can't get enough food and space to reproduce. On the other hand, if there are *not* many beneficial bacteria in the gut, the *Salmonella* population can grow and take over, causing illness—which in this case is more commonly known as food poisoning. *Salmonella* can be killed using heat, so cooking food properly is one way to keep from becoming sick.

Normal Role in Humans

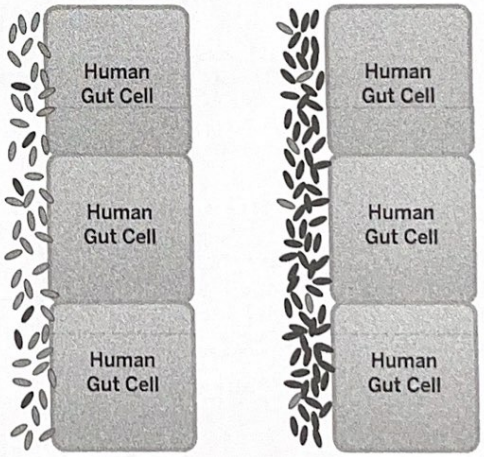
Salmonella can sometimes be found in small amounts in the guts of healthy humans, but is more likely to be found in the microbiomes of people who have recently become sick from *Salmonella* infection.

Role in Disease

In most cases, *Salmonella* causes vomiting, diarrhea, and intestinal pain for up to a week. Most people get better without treatment from a doctor, but in severe cases, *Salmonella* can leave the intestines and move into the blood, where it causes severe disease and even death.



***Salmonella* bacteria can cause the illness that people call "food poisoning."**



When lots of helpful bacteria (shown here in green) are present in the gut, there is little space and food available to harmful bacteria like *Salmonella* (shown here in red). This helps prevent the harmful bacteria from infecting the gut. When there are fewer helpful bacteria in the gut, there is more space and food available for harmful bacteria that can cause disease.

Name: _____ Date: _____

Lesson 2.4: Analyzing Experiments with Mice

Did you know that mice have microbiomes, too? Today, you will analyze data from an experiment conducted on laboratory mice. This experiment provides information about how a healthy gut microbiome full of different types of bacteria could be important to the overall health of an organism's body. By the end of this lesson, you will be able to use what you learned from the mouse experiment to figure out why Patient 23 got a different infection after being treated with antibiotics in week 5 of his case study.

Unit Question

- How can having 100 trillion microorganisms on and in the human body keep us healthy?

Chapter 2 Question

- How can fecal transplants cure patients infected with harmful bacteria?

Key Concepts

- The human microbiome contains approximately 100 trillion microorganisms. Most of these are bacteria.
- The human body provides an environment (food and space) for bacteria to survive.
- A healthy microbiome has various helpful types of bacteria.
- An infection of harmful bacteria in the human microbiome can make a person sick.

Vocabulary

- antibiotics
- bacteria
- claim
- evidence
- microorganism
- scale

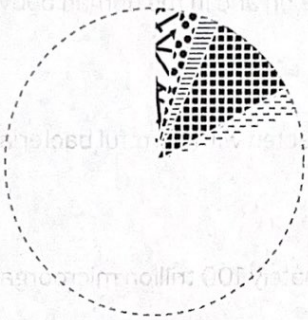
Name: _____ Date: _____

Warm-Up

The pie charts below show data about Patient 23 during weeks 5 and 7 of the case study. Using the Gut Bacteria Key, determine which new type of bacteria has been introduced to Patient 23's gut microbiome. Then, answer the questions below.

Treatment: antibiotics

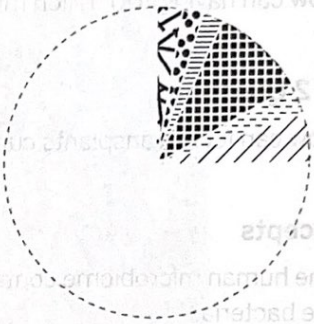
WEEK 5



Doctor's Notes

Patient feeling well again.

WEEK 7



Doctor's Notes

Patient reports stomach pains, diarrhea, and bloating.

Gut Bacteria Key

- *Bacilli* (including *L. reuteri*)
- *Bacteriodaceae* (including *B. fragilis*)
- *Prevotellaceae* (including *Prevotella*)
- *Actinobacteria* (including *B. animalis*)
- *Gammaproteobacteria* (including *E. coli*)
- Other
- *Epsilonproteobacteria* (including *C. jejuni*)
- *C. difficile*
- Space

Which new type of bacteria was introduced to Patient 23's gut microbiome?

_____

What effect do you think this new bacteria will have on Patient 23's overall health?

_____

_____

_____

_____