Unit Background

Food Borne Illness: Focus on Issues relating to *E. coli* O157:H7

The name *Escherichia coli*, AKA *E. coli*, refers to a group of bacteria that live in the intestines of animals, including humans. Most *E. coli* are harmless commensal organisms. Some are pathogens that make us sick.

*E. coli* is prevalent in feces, and is widely used as an indicator organism, meaning that if a microbiologist finds *E. coli* in a sample that indicates that the sample contained fecal contamination. This is a very common procedure to test drinking water quality.

*E. coli* O157:H7 is a specific pathogen that has become a significant problem in food. What does the name O157:H7 mean? All bacteria are covered in proteins that can trigger an immune response. Proteins that trigger an immune response are called antigens. The antigens on the body of the bacteria are called sOmatic antigens, or just O (oh) antigens for short. O157 means that this was the 157th different kind of O antigen found in *E. coli*. The antigens on the tail, or flagella are called H antigens. H7 means that this was the 7th different kind of H antigen found in *E. coli*. There are many different combinations of O and H antigens possible. Most of the *E. coli* that causes foodborne disease in the U.S. are *E. coli* O157:H7

Nebraska’s beef industry reports sales above $5.5 billion. The state has about 28,000 beef producers and beef production is worth about $5 billion a year to Nebraska. Recalls due to contamination with *E. coli* O157:H7 are a major concern. Recent major recalls include 25 million pounds of hamburger processed at the Hudson Foods Inc. plant in Columbus, Nebraska, and 443,656 pounds of ground beef from BeefAmerica’s Norfolk, Nebraska, plant.

The Hudson plant has been sold to IBP Inc., the Hudson Company has been sold to Tyson Foods and U.S. Agriculture Department officials have said they may never know where the contamination originated. Sixteen people in Colorado were sickened by meat traced to the Hudson plant. Investigators said that an outside slaughterhouse provided it.

The ground beef from BeefAmerica was recalled after meat tainted with the *E. coli* bacteria found in a Virginia grocery store was traced to the plant.

So all aspects of the *E. coli* problem, from production to outbreak investigations are important for our state.

*The “reality based” nature of this unit means that some of the exercises have significant math and writing components. These exercises can be shared with the appropriate departments, or consolidated to suit your needs and time constraints.*