



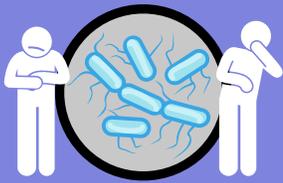
Using Science to Find the Sources of Foodborne Illness Outbreaks



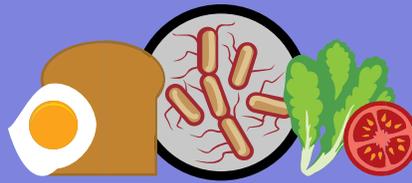
Every year, millions of Americans get sick from eating food contaminated with pathogens (e.g. harmful bacteria, parasites, viruses, etc.). To stop the spread of outbreaks, the U.S. Food and Drug Administration (FDA), together with federal, state, and local partners, is increasingly using whole genome sequencing to track down sources of food contamination. Applying this technology to food safety, something pioneered by FDA and the GenomeTrakr network, helps public health investigators identify contaminated foods and figure out how the pathogens entered the food supply.



Step 1: Collect Pathogen Samples



Medical professionals collect samples from the people who got sick.



Investigators from FDA, the U.S. Department of Agriculture (USDA), states, or local agencies collect samples from food.



Federal, state, or local investigators collect samples from production facilities, restaurants, farms, or other locations where food is handled.

Step 2: Identify Pathogens through Whole Genome Sequencing



Federal and state scientists use whole genome sequencing to reveal the order of the chemical building blocks that make up a pathogen's DNA. By identifying the genomic sequence of each pathogen collected, investigators can tell the difference between even the most closely related pathogen strains.



Living organisms, from bacteria to human beings, are made of cells. Each cell contains DNA (deoxyribonucleic acid), which is a biological instruction set for the organism to develop, function, and reproduce, and makes each organism unique.

Step 3: Compare Genomic Sequences



Scientists from FDA, USDA, the Centers for Disease Control and Prevention (CDC), and the states compare the genomic sequences from the pathogens found in food and from places the food was handled, to the pathogens from people who got sick, to see if there is an identical or very close match. These comparisons at the genetic level can precisely and quickly identify common illnesses, foods, and locations where a given pathogen has been found.

Action

When illnesses are linked to a contaminated food or food handling environment, FDA, its federal, state, and local partners, and the food industry work to prevent more people from becoming sick. Meanwhile, investigators continue their work to understand exactly where and how the pathogen got into the food supply so steps can be taken to keep the contamination from happening again.

