

# Pathogen Tracker Game



## Vocabulary List

**antidote** - a substance used to neutralize or counteract the effects of a poison

**agarose gel** – a thick, porous jello-like substance that acts like a molecular strainer by allowing smaller DNA pieces to move through more easily than larger pieces

**bacteria** - microscopic organisms whose single cells have neither a membrane-bounded nucleus nor other membrane-bounded organelles like mitochondria and chloroplasts

**biodiversity** – the number and variety of different species found within a particular area

**CDC** – Centers for Disease Control and Prevention – an agency of the United States Department of Health and Human Services (HHS). CDC's mission is to create the expertise, information, and tools that people and communities need to protect their health – through health promotion, prevention of disease, injury and disability, and preparedness for new health threats. CDC is not a regulatory agency however, it does develop guidelines pertaining to food safety and security and foodborne illness surveillance.

**contamination** – the unintended presence of harmful substances or microorganisms in food

**control group** - the group of test subjects left untreated or unexposed to some procedure and then compared with treated subjects (experimental group) in order to validate the results

**culture** - the propagation of microorganisms in a growth medium

**database** - a collection of organized information in a regular structure

**DNA – (deoxyribonucleic acid)** a molecule that forms a double helix composed of units called nucleotides. Each nucleotide is composed of a sugar (deoxyribose) connected to 1 of 4 nitrogenous bases by a phosphate molecule. DNA encodes genetic information in all living cells and in many viruses.

***Escherichia coli*** – a bacterium that is normally found in the small intestines of humans and animals; however, there are strains that can produce deadly toxins

**extract** – to remove or separate

**FDA** – Food and Drug Administration – an agency of the United States Department of Health and Human Services (HHS). The FDA is responsible for protecting the public health by assuring the safety, efficacy, and security of human and veterinary drugs, biological products, medical devices, the nation's food supply, cosmetics, and products that emit radiation. FDA develops the model food code which provides guidance for preventing foodborne illness to the states and retail food establishments, such as grocery stores and

restaurants. The FDA is the agency of the U.S. government authorized by Congress to inspect, test, and set safety standards for all food, except meat, poultry, and processed eggs.

**foodborne illness** - infection or intoxication caused by the transfer of pathogenic microbial or chemical contaminants (substances that spoil or infect) from food to a human. An infection results from the transfer of the microbe from the food to a human. An intoxication results from the transfer of toxins formed by the microbe in the food to a human.

**foodborne pathogen** – a microorganism that infects you when you eat contaminated food

**genetic fingerprinting** – analyzing DNA fragments to determine the identity of an organism

**genotype** – the identity of an individual or group of individuals based exclusively on its/their genetic makeup

**incidence rate** – the number of new cases of disease in a population occurring over a specific period of time based on the size of the population at the middle of the time period. This rate is calculated as a fraction. The numerator is the number of new events (cases) occurring in a defined period; the denominator is the size of the population at the middle of this time period.

**infected group** – (experimental group, also known as “cases”) – the group of test subjects that is treated or exposed to some procedure and then compared with untreated subjects (control group) in order to validate the results

**isolate** – a microorganism that is separated out from the rest of the culture for the purpose of identifying or characterizing it

***Listeria monocytogenes*** – a pathogen capable of growing slowly at refrigerator temperatures. It can cause serious problems in vulnerable people, especially pregnant women, newborns, people with weakened immune systems, and the elderly.

**matched-pairs analysis** - a form of analysis in which each of the subjects in a study (experimental) group is paired with each of those in a comparison (control) group on the basis of matching factor(s) ; case-control study.

**mutate** – to undergo change

**obtundation** – a state of decreased awareness; near coma – usually the result of a medical condition or trauma

**outbreak** – the incident in which two or more cases of a similar illness result from eating the same food

**parameter** – a variable whose measure is indicative of a quantity or function that cannot itself be precisely determined by direct methods

**pathogen** - a microorganism, such as a bacterium, virus, fungi, prion, or parasite, that causes disease

**Pathogen Tracker** - an innovative Web-based tool for information exchange on bacterial subtypes and strains and for studies of bacterial biodiversity and strain diversity

**PCR** - polymerase chain reaction is a technique in genetics that permits the analysis of any short sequence of DNA (or RNA) even in samples containing only minute quantities of DNA or RNA. PCR is used to reproduce (amplify) selected sections of DNA or RNA for analysis

**phenotype** – the appearance of an organism as a consequence of its genotype and the environment

**restriction enzyme** - an enzyme that can recognize specific base sequences in DNA and cut the DNA into fragments at that site (the restriction site). A restriction enzyme acts as a biochemical scissors.

**riboimage** – a riboprint that shows a pattern

**riboprint** – a genetic fingerprint showing the banding pattern of the DNA sequences that code for the RNA portion of ribosomes

**ribosome** – a tiny particulate structure located in the cell's cytoplasm. Ribosomes are the cell's essential protein factory

**ribotyping** – one method of genetic fingerprinting in which a riboprint is made

**RNA (ribonucleic acid)** – a substance that reads the genetic information carried by DNA; the same as DNA except that it is made up of only one strand, contains the base uracil (U) instead of thymine (T), and contains the sugar ribose instead of deoxyribose. RNA is formed upon a DNA template

**Salmonella** – a group of bacteria that can cause diarrheal illness in humans

**statistical analysis** – refers to the methods used to analyze data and report overall trends

**Southern blot** – a test commonly used in genetics to check for a match between DNA molecules. In this technique, DNA fragments are separated by a method called agarose gel electrophoresis, transferred (blotted) onto membrane filters, and hybridized with complementary radiolabeled probes. The aim is to detect specific base sequences with the probes. This blot is named after its inventor, M. E. Southern.

**species** – a group of organisms that have a high level of genetic similarity

**strain** - a variation of a particular species that possesses minor differences in its characteristics though still remains distinguishable

**subspecies** – a group subordinate to species; the differences between subspecies are usually less distinct than the differences between species

**swab** – to use a wad of absorbent material wound around one end of a stick to transfer material from a suspected contaminated area to a culture plate

**USDA** – United States Department of Agriculture –USDA enhances food safety by taking steps to reduce the prevalence of foodborne hazards along the farm-to-table continuum. It

also strives to improve nutrition and health by providing food assistance and nutrition education and promotion, and managing and protecting America's public and private lands working cooperatively with other levels of government and the private sector. The United States Department of Agriculture (USDA), United States Food and Drug Administration (FDA) and Centers for Disease Control and Prevention (CDC) work cooperatively to enhance food safety.

**zoonotic** – a disease that can be transmitted from animals to humans