



## Essential Microbiology – Part 2

**OBJECTIVES:** UNDERSTAND HOW FOOD BECOMES CONTAMINATED. UNDERSTAND WHAT FOOD BORNE ILLNESSES ARE.

### HOW DOES FOOD BECOME CONTAMINATED?

We live in a **microbial world**, and there are many opportunities for food to become contaminated as it is **produced and prepared**. Many food-borne microbes are present in healthy animals (usually in their intestines, hides, feathers, etc) raised for food.

In food processing, **food borne microbes can be introduced from infected humans who handle the food, or by cross contamination from some other raw agricultural product and/or the establishment environment**. For example, the unwashed hands of food handlers who are themselves infected can introduce bacteria and viruses.

In the RTE (ready to eat) processing environment exposed product that is fully cooked can become cross contaminated if it touches raw meat or poultry that contain pathogens or from food contact surfaces that are contaminated.



- **WHAT ARE MICRO-ORGANISMS?**
- **WHAT ARE BACTERIA?**
- **HOW DO BACTERIA GROW AND MULTIPLY?**

In the kitchen, **microbes can be transferred from one food to another food by using the same knife, cutting board or other utensil to prepare both without washing** the surface or utensil in between.

**The way that food is handled after it is contaminated can also make a difference in whether or not an outbreak occurs.** Many microorganisms need to multiply to a larger number before enough are present in food to cause disease. Given warm moist conditions and an ample supply of nutrients, one bacterium that reproduces by dividing itself every half hour can produce 17 million in 12 hours.

### FOODBORNE ILLNESS

Microorganisms can cause a variety of effects in food products including spoilage, which primarily affects product quality, and food poisoning, which is generally caused by pathogens.

We are most concerned with the effects that microorganisms have on food that leads to food borne illness, because this affects public health (consumers).

**A food borne illness (or disease) is exactly what the term indicates - a disease or illness caused by the consumption of contaminated foods or beverages.**

A food borne microbial pathogen, or a preformed microbial toxic product, or another poison such as a poisonous chemical that has somehow contaminated the food and/or beverage, leads to one of the many different food borne illnesses.

More than 200 different food borne diseases have been described. Most of these diseases are infections, caused by a variety of bacteria, viruses, and parasites. Other diseases are poisonings, caused by harmful toxins or chemicals that have contaminated the food, for example, poisonous mushrooms or heavy metal contamination.