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Najnin Rimi
University of Richmond

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A recent outbreak of salmonella caused many grocery stores to recall their onions and many unknowing consumers to become ill. A major produce supplier from California, Thompson International Inc., had announced a recall on August 1st for all onion types distributed by the company starting May 1st of 2020.[1] This caused a recall from over hundreds of grocery stores, even our familiar Kroger and Walmart grocery stores.

Salmonella infection begins with the ingestion of Salmonella bacteria. This typically occurs with food, especially undercooked food.2 Consuming undercooked meat is discouraged to prevent salmonella along with other microbial infections.[2] By cooking the meat at a specific temperature, you kill microbes that may have been present. However, this should not be the step taken for recalled items as they should be disposed of immediately. Water has also been known to transmit salmonella, yet, salmonella is rarely transmitted from person-to-person.2 An investigation by the CDC reports that pets can also transmit the bacteria, including bearded dragons and hedgehogs.3 There were thirteen infections from eight states and thirty-two infections from seventeen states potentially from bearded dragons and hedgehogs respectively.[3]

Salmonella is a rod-shaped bacterium that lives in animal and human intestines and is spread through feces. Once ingested, it passes through the stomach as it is known to survive its high acidity.[4] The bacteria populate the intestines and seep into the tissue. Potentially, the bacteria can enter the bloodstream via the lymphoid tissue and spread throughout the body. This presents dangers to other bodily organs such as the brain or spinal cord, causing meningitis.

The mechanism of how salmonella infections occur is clever for the bacteria, yet dangerous for us. Salmonella enters the intestinal tract and then binds to a receptor on the surface of the membrane of the epithelial cells.[5]

One way the bacteria enter the intestinal tract is by hiding inside macrophages, which are large cells that consumes potentially harmful compounds in our body, after passing through the intestinal tissue.[6] This allows the bacteria to escape immunity by its host. Thus, it's another way for the salmonella bacteria to reach the bloodstream as the macrophages travel in our blood vessels. However, a large quantity of the bacteria dies upon their exit of the intestines.[7]

The next step after entering the membrane of the intestinal surface cells is for the bacteria to continue to replicate and destroy the host cells. They live inside the epithelial cells where the bacteria produce a short-term anti-inflammatory response that has the potential to cause ulcers. They also produce toxins which prevent the intestinal cells from making proteins.[8] Their entrance into the body signals to the production of proinflammatory cytokines, which promote an inflammatory response.[8] However, these proinflammatories could be the reason for intestinal damage during a salmonella infection. An enzyme, known as adenylate cyclase, is activated which causes an increase in cyclic AMP, leading to liquids being secreted from the cell.[8] Diarrhea is manifested from this response. Many other symptoms occur due to the immune system reaction and others occur due to damage from the bacteria.[9]

Salmonella can be very dangerous, and so it is crucial to catch an outbreak early. Preventing a salmonella infection starts with basic hygiene such as hand-washing before eating, cooking, or touching your face.[10] Currently, this practice has been augmented. Nonetheless, the pandemic should not be the only reason we wash our hands. Many living things can cause harm in our body, and Salmonella is only one of the grand sum, so it is vital to continue to practice good hygiene for the sake of our health and the health of others.

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