



Food Poisoning Toxins of *Bacillus cereus* and its Classification

Masataka Hayashi*

Department of Microbiology and Infection Control Sciences, Kyoto Pharmaceutical University, Kyoto, Japan

DESCRIPTION

Bacillus cereus, a member of *Bacillus* genus is a rod-shaped, gram-positive, motile (flagellated), spore-forming bacteria. It is a bacterium that forms spores and releases toxins that result in vomiting or diarrhea. The majority of symptoms are mild and transient (up to 24 hours). *B. cereus* is frequently found in both the surrounding environment (such as soil) and also in a wide range of foods. Spores can endure harsh conditions, including the temperatures associated with cooking. Eating foods that have been left out at room temperature frequently results in *Bacillus cereus* in the intestine. Even after reheating the food, food poisoning can still happen. *B. cereus* in the intestines produces toxic spores. These spores can multiply in quantity at room temperature. These toxins can cause diarrhoea after eating these spores.

B. cereus food poisoning is an acute intoxication that happens when this microbe creates toxins, leading to either a diarrheal syndrome or an emetic (vomiting) syndrome, both of which are gastrointestinal illnesses. In the entire world, *B. cereus* is regarded as a relatively frequent cause of gastroenteritis. Therefore, proper food handling, especially after cooking, will help prevent illnesses brought on by this microorganism. *B. cereus* will grow in food that has been improperly stored.

Bacillus cereus infections of the intestine are relatively frequent. *Bacillus cereus* can be intestinal or non-intestinal in people of all ages and races. People are more likely to have non-intestinal *Bacillus cereus*, if they are newly born; having an indwelling catheter that removes urine from their body; having a weakened immune system; having wounds from trauma or surgery; or are immunologically compromised; using medications administered Intra-Venously (IV).

Bacillus cereus (*B. cereus*) is a microscopic spore-forming bacterium that can only be seen under a microscope. *B. cereus* is frequently found in the environment. This microorganism creates a poison (toxin) that can make people sick.

CLASSIFICATION

There are two types of *Bacillus cereus*. They either have an impact on the gastrointestinal system (intestinal) or other bodily parts (non-intestinal).

B. cereus in the intestines causes food poisoning. This condition typically gets better rapidly on its own. However, if the immune system is weak or damaged, then people might run into the risk of developing more serious disease.

Bacillus cereus (non-intestinal *B. cereus*), which is unrelated to food poisoning, can result in more serious infections. If one is having non-intestinal *B. cereus*, a weakened or damaged immune system, additional wounds or injuries from surgery or trauma, or both, then they have a higher chance of developing more serious infections.

Most emetic and diarrheal symptoms are self-limiting and resolves in one to two days. It can occasionally be more serious. The diarrheal condition may be more common in older people and people with reduced stomach acidity.

Intestinal *Bacillus cereus*

Food poisoning is brought on by intestinal *Bacillus cereus*, a digestive disorder. Intestinal *Bacillus cereus* comes in two different varieties. Vomiting is the first type brought on by an emetic toxin, while diarrhea is the second type brought on by enterotoxins.

Enterotoxins (diarrheal) syndrome: In the enterotoxin version of illness, small intestine produces the toxin. This happens after eating food contaminated with bacteria or the cells they produce (spores). In the United States and Europe, this variety of *B. cereus* is most prevalent.

Usually, food illness sets in six to fifteen hours after consuming tainted food. Fish, dairy, meat, sauces, soups and stews, and vegetables are among the foods that can spread this illness.

Correspondence to: Masataka Hayashi, Department of Microbiology and Infection Control Sciences, Kyoto Pharmaceutical University, Kyoto, Japan, E-mail: mahayashi@yahoo.com

Received: 14-Oct-2022, Manuscript No. JBP-22-19037; **Editor assigned:** 17-Oct-2022, Pre QC No. JBP-22-19037 (PQ); **Reviewed:** 31-Oct-2022, QC No. JBP-22-19037; **Revised:** 07-Nov-2022, Manuscript No. JBP-22-19037 (R); **Published:** 14-Nov-2022, DOI: 10.35248/2155-9597.22.13.436.

Citation: Hayashi M (2022) Food Poisoning Toxins of *Bacillus cereus* and its Classification. J Bacteriol Parasitol. 13:436.

Copyright: © 2022 Hayashi M. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Emetic (vomiting) syndrome: If people have the emetic variant of this illness, the toxin develops in the food before they consume it. Typically, one to six hours following the consumption of tainted food, causes illness.

The most typical food source for this kind of *Bacillus cereus* is rice. *B. cereus* is not found in all rice, but it can grow when cooked rice is left out of the refrigerator for an extended period of time. Cheese and starchy foods such as pasta, pastries, potatoes, and sushi are additional foods that can contribute to this illness.

Non-intestinal *Bacillus cereus*

When *Bacillus cereus* spores penetrate a person's body and release toxins, it can lead to non-intestinal disorders. Spores can be acquired from: catheters used in hospitals that are contaminated. Infection outbreaks in hospitals, inhaled polluted dust, and infected wounds.

Bacteria in one's bloodstream can cause a variety of conditions other than digestive diseases (bacteremia), bacterial or fungal eye

infection (endophthalmitis), brain infection, meningitis, osteomyelitis, cellulitis, endocarditis, and pneumonia. Symptoms vary based on the type of illness. The most serious illness is endophthalmitis.

CONCLUSION

B. cereus is a typical soil dweller that is typically kept apart from food. The dairy business is facing growing difficulties with psychotropic strains. Since *B. cereus* food poisoning is not a condition that can be reported, it is greatly underrepresented in official statistics. Two distinct forms of food poisoning are brought on by *B. cereus*: one is diarrheal (infection) brought on by enterotoxins and the other is emetic (intoxication) brought on by a preformed short cyclic peptide. The range of *B. cereus* cells needed to cause the diarrheal type of infection is between 10⁵ and 10⁷. The characterization of at least two distinct enterotoxins linked to food poisoning has been done. One of the three component proteins is hemolytic, while the other is not.