

Food poisoning - it's so unpredictable

While we are often exposed to bacteria in our food which could cause food poisoning, we don't always become ill - why should this be so?

Professor Colin Hill who is presenting his work at the Society for General Microbiology's autumn meeting in Nottingham today describes how bacteria use different tricks to aid their survival inside the body, helping to explain why food poisoning can be so unpredictable.

One of the biggest challenges faced by food-borne bacteria is acid. Acidic conditions, particularly in the stomach and in the gut will kill most microbes found in contaminated food.

Professor Hill's group at University College Cork has revealed that *Listeria* bacteria, which may be found in soft cheeses and chilled ready-to-eat products, can overcome harsh acidic conditions by exploiting key food ingredients. *Listeria* that survive are able to cause serious and sometimes fatal infections, particularly in the elderly and pregnant women.

Certain food constituents such as the amino acid, glutamate, can help the bacteria neutralise acid, allowing the bacteria to pass through the stomach unscathed. Professor Hill explains the significance of this.

A greater chance of infection

"People who consume foods that are contaminated with *Listeria* and are also high in glutamate, such as soft cheese or meat products, have a higher chance of developing serious infection than someone eating the same quantity of bacteria in a low-glutamate food," he said. "Of course this is further complicated by the fact that a contaminated, low-glutamate food could be eaten in combination with a high-glutamate food such as tomato juice, which could also increase the risk of infection."

Listeria can also take advantage of food processing and storage conditions to help them survive. "Bacteria that are exposed to low pH before entering the body may adapt to become more acid-tolerant and therefore better equipped to deal with acidic conditions in the body. For example, *Listeria* contaminating naturally acidic foods such as cheese may be more likely to cause infection than *Listeria* carried at a more neutral pH in water.

Professor Hill explains how his group's work could help reduce the incidence of *Listeria* infections. "The number of cases of listeriosis has nearly doubled in the last decade in Europe. This is because the bacterium is so good at overcoming the challenges it faces in food and in the body," he said. "Our studies show that consuming *Listeria* in one food may be quite safe, while eating the same amount in another food might be lethal. By understanding the role of the food matrix we may be able to identify and eliminate high-risk foods from the diet of susceptible people."

Source: Society for General Microbiology

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