

Listeriosis

WE ASK OUR EXPERTS

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What is listeriosis?

Listeriosis is a foodborne disease caused by the bacteria *Listeria monocytogenes*.

L. monocytogenes multiplies in a wide range of pH and temperatures, including refrigeration temperatures. It is capable of forming biofilms on a wide variety of surfaces in food industries.

What is a biofilm?

A biofilm is a community of cells stuck to a solid substrate immersed in a viscous matrix of polymeric substances excreted by the cells themselves. This provides a degree of protection from disinfectant products, which also complicates microbiological control sampling techniques. The biofilm provides the bacteria with greater resistance to elimination, meaning it can persist after cleaning and disinfection.

How is listeriosis transmitted?

The main transmission pathway in humans is the consumption of contaminated food.

Food contamination can occur at any stage in which the product is exposed to the environment.

What foods are most frequently associated with listeriosis?

The foods most frequently associated with listeriosis are refrigerated, ready-to-eat foods with a long shelf life. Such foods include cooked sausages and patés, smoked fish, dairy products (soft cheeses, raw milk and ice creams made from raw milk) and prepared fresh salads, vegetables and fruits.

How is it transmitted?

The main transmission pathway in humans is consumption of contaminated food. Thus, it is an infection that can be prevented and avoided.

Is listeriosis frequent in the EU and Spain?

In 2020, there were 1,876 cases of listeriosis in humans in the EU.

Listeriosis has been a notifiable disease in Spain since 2015. Outbreaks are difficult to investigate, due to the long incubation period for the disease (5-70 days), which hinders the study of the food patients have eaten. In 2020, there were 191 confirmed cases of listeriosis.

What do food industries and the competent authorities do to control listeriosis?

Food industry operators are responsible for placing safe food on the market.

EU legislation establishes maximum limits for *L. monocytogenes* in different foods. Food establishments must have a regular sampling plan in place to ensure they comply with these limits and, if they do not, they must carry out the necessary actions to ensure only safe food is placed on the market.

Can *L. monocytogenes* be present without having been detected?

Test procedures to detect pathogenic microorganisms responsible for food poisoning, such as listeriosis, can be complex, slow and costly, making them difficult to use routinely in the lab. Although a positive result for a specific pathogen detection procedure is conclusive for confirming the presence of the pathogen, it is not usually obtained quickly enough to apply preventative measures and, in some cases, false negatives may be returned due to circumstantial reasons, such as low concentrations of the target microorganism, uneven distribution on the tested surface and limitations to the sampling technique.

Can conveyor belts be critical in listeriosis transmission?

Conveyor belts are essential components in food industry facilities and some of them should be considered high-risk critical surfaces, given that, as with work tables, receptacles and utensils, they come into direct contact with the food. Therefore, they must be designed to facilitate cleaning and disinfection operations to reduce the risk of contamination of conveyed products as far as possible.



How can Esbelt AM belts prevent an increase in the risk of listeriosis transmission?

Using materials with anti-microbial (AM) properties in the manufacture of conveyor belts provides a barrier that hinders the growth of microorganisms and biofilm formation and also serves as a preventative measure to reduce the chances of equipment becoming a focal point for food contamination. The function of a conveyor belt with antimicrobial properties is not to reduce contamination of conveyed products but to ensure the use of belt does not add to the microbial load.

Can AM belts affect the production or composition of foods?

AM belts comply with European legislation on materials intended to come into contact with food, Regulation (EC) 1935/2004, and Regulation (EU) 10/2011, which establishes a list of monomers, additives and other substances that can be used in the production of plastics for contact with food and also sets out the basis for migration tests (permitted limits, food simulants, contact times, etc.).

The AM additive is a bacteriostatic component, not a bactericide. Thus, the belt is not a disinfectant agent, nor does it affect the "good" or "bad" bacteria in the food, as it does not reduce the bacterial load of the conveyed product, but it prevents the belt from increasing the bacterial load.



Is the AM property effective throughout the working life of the belt?

The AM component is incorporated into the belt formula itself, not just the surface, and provides very long-lasting effectiveness. It continues to work even when the cover is worn, scratched, cracked or cut. Unlike other alternatives, the AM additive is not water-soluble, so it will resist the strictest belt cleaning and disinfection procedures. Incorporating the AM property should not be seen as a substitute for cleaning protocols, but it can help make such protocols more effective and reinforce the preventive measures policy based on the hazard analysis and critical control points (HACCP) philosophy.

How can the antimicrobial (AM) properties of a surface in contact with food be assessed?

The reference for international standard is [ISO 22196](#): Measurement of antibacterial activity on plastics and other non-porous surfaces.

What does the ISO 22196 standard consist of?

The test specified in standard ISO 22196 consists of determining growth of a suspension of microorganisms (Staphylococcus aureus, Escherichia coli and Listeria monocytogenes, among others), after an incubation period, in a spiked test sample of material and comparing it to the result from a sample of the same material without the AM treatment that provides the antimicrobial capacity. Thus these are comparative tests.

What reduction in the microbial load can be obtained from an ISO 22196 - compliant belt?

A reduction in microbial growth of over 99% has been determined in tests using different bacteria (Staphylococcus aureus, Escherichia coli, Listeria monocytogenes, Salmonella enteritidis), based on ISO 22196 standard.

With special mention, a reduction of 99.97% has been obtained for Listeria monocytogenes.

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