

Imported food risk statement
Uncooked ready-to-eat spreadable sausages and *Listeria monocytogenes*

Commodity: Uncooked spreadable sausages that are ready-to-eat (RTE). An example of this type of product includes some varieties of teewurst. Ambient stable sealed packages are not covered by this risk statement.

Microorganism: *Listeria monocytogenes*

Recommendation and rationale
<p>Is <i>L. monocytogenes</i> in uncooked RTE spreadable sausages a medium or high risk to public health:</p> <p><input checked="" type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Uncertain, further scientific assessment required</p> <p>Rationale:</p> <ul style="list-style-type: none">• Human illness has been associated with consumption of uncooked RTE spreadable sausages. For susceptible populations, infection with <i>L. monocytogenes</i> can have severe consequences• This commodity is able to support the growth of <i>L. monocytogenes</i> during the shelf-life of the product and <i>L. monocytogenes</i> is able to grow during refrigeration storage

General description
<p>Nature of the microorganism:</p> <p><i>L. monocytogenes</i> is a Gram-positive, non-spore forming rod-shaped bacterium that can grow in both aerobic and anaerobic conditions. It is found throughout the environment and has been isolated from domestic and wild animals, birds, soil, vegetation, fodder and wet areas of food processing environments (FSANZ 2013).</p> <p>A distinguishing feature of <i>L. monocytogenes</i> is its ability to grow at refrigeration temperatures. Growth can occur at temperatures between 1.5 – 45.0°C, pH of 4.0 – 9.6 and a minimum water activity of 0.90 when other conditions are near optimum. Temperatures above 50°C are lethal to <i>L. monocytogenes</i>, however, it is able to survive frozen storage at -18°C (ICMSF 1996; FSANZ 2013).</p>
<p>Adverse health effects:</p> <p>For susceptible populations <i>L. monocytogenes</i> is a severe hazard as it can cause life threatening illness (ICMSF 2002). People at risk of invasive listeriosis include pregnant women and their foetuses, newborn babies, the elderly and immunocompromised individuals (such as cancer, transplant and HIV/AIDS patients). Less frequently reported, but also at a greater risk, are patients with diabetes, asthma, cirrhosis and ulcerative colitis (FSANZ 2013).</p> <p>In pregnant women invasive listeriosis can cause spontaneous abortion, stillbirth or neonatal infection. Influenza-like symptoms, fever and gastrointestinal symptoms can also occur in the mother. In immunocompromised individuals and the elderly invasive listeriosis can cause potentially fatal bacterial meningitis with symptoms of fever, malaise, ataxia and altered mental status. The onset of illness of invasive listeriosis generally ranges from 3 days to 3 months after infection. Invasive listeriosis has a fatality rate of 15 – 30% (FDA 2012; FSANZ 2013).</p> <p>Nearly all cases of listeriosis in susceptible people result from the consumption of high numbers of the pathogen (Chen et al. 2003; FAO/WHO 2004). However, some foods support the growth of <i>L. monocytogenes</i>, enabling high levels of <i>L. monocytogenes</i> to be achieved that may lead to illness.</p> <p>Exposure to <i>L. monocytogenes</i> has minimal impact on the general healthy population. If illness does occur it is often mild and may be mistaken for a viral infection or flu (FSANZ 2012).</p>

FSANZ provides risk assessment advice to the Department of Agriculture on the level of public health risk associated with certain foods. For more information on how food is regulated in Australia refer to the [FSANZ website](#) or for information on how imported food is managed refer to the [Department of Agriculture website](#).

Consumption pattern:

Uncooked RTE spreadable sausages were not identified as being consumed by any of the respondents (2 years and over) in the 1995 National Nutrition Survey (McLennan and Podger 1999) or the respondents (2-16 years) in the 2007 Australian National Children's Nutrition and Physical Activity Survey (DOHA 2008).

Key risk factors:

Post-processing contamination including cross-contamination can occur as *L. monocytogenes* is a ubiquitous organism and can become established in processing environments. Uncooked RTE spreadable sausages have a higher water activity than other uncooked RTE sausages due to a shorter ripening time (MLA 2003). The inherent characteristics of uncooked RTE spreadable sausages allow the growth of *L. monocytogenes*, even when stored at <4°C.

Risk mitigation:

Reducing the prevalence of *L. monocytogenes* at the processing plant level and reducing the initial load of *L. monocytogenes* on finished RTE processed meat would lead to a significant reduction of the number of cases of listeriosis resulting from consumption of processed RTE meat (Ross et al. 2009). Good hygienic practices in food manufacturing and food handling will minimise *L. monocytogenes* contamination of uncooked RTE spreadable sausages.

In Australia Division 3 of [Standard 4.2.3 of the Australia New Zealand Food Standards Code](#) (the Code) states that RTE meat must be produced under a food safety management system which identifies, evaluates and controls food safety hazards. Clause 5 includes additional requirements for uncooked comminuted fermented meat for the fermentation, maturation and smoking processes. [Standard 1.6.1 of the Code](#) contains limits for *L. monocytogenes* based on whether growth can occur or not:

- For RTE food in which growth of *L. monocytogenes* will not occur n=5, m=10² cfu/g
- For RTE food in which growth of *L. monocytogenes* can occur n = 5, m=not detected in 25g

Public information for vulnerable populations to avoid consumption of RTE food that supports the growth of *L. monocytogenes* is available on various government websites [including FSANZ's website](#).

Compliance history:

The imported food compliance data sourced from the Imported Food Inspection Scheme of the Australian Department of Agriculture indicated that during the period of January 2007 – June 2013 there were no imports of uncooked RTE spreadable sausages.

There were no notifications on the European Commission's Rapid Alert System for Food and Feed (RASFF) for *L. monocytogenes* in uncooked RTE spreadable sausages during the period January 2007 – June 2013. There were four notifications for *L. monocytogenes* in sausages and three notifications for *L. monocytogenes* in several undisclosed meat and delicatessen products from multiple countries, however, it was not stated if any of these products were uncooked RTE spreadable sausages.

There have been no food recalls in Australia due to the presence of *L. monocytogenes* in imported or domestically produced uncooked RTE spreadable sausages from January 2007 – June 2013.

Surveillance information:

Listeriosis is a notifiable disease in all Australian states and territories with a notification rate in 2012 of 0.4 cases per 100,000 population (93 cases). The previous five year mean was 0.3 cases per 100,000 population per year (ranging from 0.2 – 0.4 cases per 100,000 population per year) (FSANZ 2013).

Illness associated with consumption of uncooked RTE spreadable sausages contaminated with *L. monocytogenes*

There are limited reports of listeriosis outbreaks associated with the consumption of uncooked RTE spreadable sausages.

- Outbreak in France in 2002, eight cases including five immunocompromised individuals and one fatality. A RTE spreadable sausage prepared from raw pork and fat was the main vehicle of transmission. A strain of *L. monocytogenes* with the same characteristics as the outbreak strain was isolated from an unopened package of the spreadable sausage (Goulet et al. 2002)

Prevalence of *L. monocytogenes* in uncooked RTE spreadable sausages

Data on the prevalence of *L. monocytogenes* in uncooked RTE spreadable sausages is limited.

- Survey in Germany in 2000 – 2002, *L. monocytogenes* was isolated from 1.7% of raw fillings of raw spreadable sausages (n=3,250) and finished raw spreadable sausages (n=1,180), the level of contamination was <100 CFU/g and no *L. monocytogenes* growth was detected during the shelf life of the products (Hechelmann et al. 2002)
- Survey in Germany in 2009 – 2010, *L. monocytogenes* was isolated from 36% of raw RTE spreadable sausages of turkey meat and onion (n=11), the level of contamination was <100 CFU/g (Meyer et al. 2012)

Other relevant standard or guideline

- Codex general principles of food hygiene *CAC/RCP 1 – 1969* follows the food chain from primary production through to final consumption, highlighting the key hygiene controls at each stage (Codex 2003)
- Codex code of hygienic practice for meat *CAC/RCP 58-2005* covers additional hygienic provisions for raw meat, meat preparations and manufactured meat from the time of live animal production up to the point of retail sale (Codex 2005)
- Codex guidelines on the application of general principles of food hygiene to the control of *L. monocytogenes* in foods *CAC/GL 61 – 2007* (Codex 2009) states:
 - For RTE foods in which growth of *L. monocytogenes* can occur the microbiological criterion for *L. monocytogenes* is n=5, c=0, m=absence in 25g
 - For RTE foods in which growth of *L. monocytogenes* cannot occur the microbiological criterion for *L. monocytogenes* is n=5, c=0, m=100 CFU/g

Approach by overseas countries

Many countries, such as the European Union, the United States and Canada, have HACCP-based regulatory measures in place for meat products.

The United States has a zero tolerance for *L. monocytogenes* in RTE products as required by the Code of Federal Regulation 9 CFR 430. Three alternative methods can be used to control *L. monocytogenes* contamination of post-lethality exposed RTE products: (i) apply a post-lethality treatment to reduce or eliminate *L. monocytogenes* and an antimicrobial agent or process to suppress or limit growth of *L. monocytogenes*; (ii) apply either a post-lethality treatment or an antimicrobial agent or process; or (iii) rely on its sanitation program to control *L. monocytogenes* (FSIS 2014).

The European Commission regulation on microbiological criteria for foodstuffs (No. 2073/2005) specifies that n=5, c=0, m=100 CFU/g as food safety criteria for *L. monocytogenes* in RTE foods other than those intended for infants and for special medical purposes. This criterion applies to products, such as uncooked RTE spreadable sausages, placed on the market during their shelf-life (European Commission 2005).

Other considerations

Quarantine restrictions apply to certain products under this commodity classification and are available at the [ICON database](#).

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