With listeriosis hitting the headlines again this year, Lisa Green takes a look at the causative organism and discusses the contribution of more effective microbiological culture media to its isolation and identification

**TWENTY years** ago, the Public Health Laboratory Service published a report that outlined a sharp rise, followed by a sharp fall, in reported cases of listeriosis across England and Wales. At the time, the exact reasons behind the outbreak were unclear but the subsequent decrease in cases coincided directly with a public health campaign about foodborne *Listeria monocytogenes* and the risks to certain sectors of the population. Following the conclusion of the campaign, it was noted within the Communicable Disease Report that: “There is no cause for complacency, however, because the reasons for these changes are poorly understood. A new risk factor may emerge or warnings about high risk foods may be increasingly disregarded as the media publicity wanes; the trends could, therefore, reverse again.”

Today Listeria infection still remains a cause for concern. In 2007 the Food Standards Agency reported a large increase in the number of cases of listeriosis compared with the previous year, and also indicated a change to the pattern of disease. In the 1990s it was mostly associated with pregnant women, but in 2007 approximately 70% of cases were in people over sixty years of age. This year’s National Food Safety Week (held in June) focused specifically on the need for correct storage and handling of food in the home, targeting in particular people over sixty. Overall, the incidence of Listeria infection in this age group has doubled since 2001 and is the cause of more deaths than *Salmonella*.

However, in vulnerable groups it can have serious consequences. Pregnant women, older people and those with compromised immune systems are much more susceptible. In pregnancy it is especially dangerous because although the illness is unlikely to be harmful for the mother, it can cause miscarriage, premature delivery or severe illness in a newborn child. In non-pregnant adults it is an important cause of septicaemia and bacterial meningitis. Drawn from figures published by the HPA, Figure 1 indicates overall figures for human cases of *Listeria monocytogenes* in England and Wales.

The challenge in the food industry is to achieve rapid and routine monitoring for *L. monocytogenes*. Strict regulation designed to minimise the incidence of Listeria infection is now in place. The European Regulation EC 2073/2005 "Microbiological Criteria for Foodstuffs" states that all "Ready-to-eat" foods (RTE being defined as food that is sold ready for consumption without the need for cooking or reheating) must be tested for Listeria. Ready-to-eat food for infants and special medical purposes must demonstrate absence of *Listeria monocytogenes* in 25 g during product shelf-life and other RTE foods must demonstrate the absence of *Listeria monocytogenes* in 25 g before product leaves the factory and must remain below 100 colony forming units (cfu) per gram throughout its shelf-life.

There are six species of *Listeria*, but only the pathogenic *Listeria monocytogenes* is known to cause disease in man. This Gram-positive bacillus occurs widely in nature, livestock and the environment, and, until the 1980s when there were several large outbreaks, listeriosis was regarded as a rare human disease. Although killed by cooking food and by pasteurisation, the organism is unusual in its ability to grow at low temperatures, thriving in normal refrigerator conditions. The primary transmission route to humans is regarded as being through foods contaminated during production. Most likely to be affected are unpasteurised cheeses, cold cuts of meat, pâtés and smoked fish, or pre-cooked ready meals that have been chilled for some time.

For most people, Listeria infection results at most in a mild and relatively harmless flu-like illness or gastroenteritis, and it exists in a harmless carrier state in a small proportion of the population.
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Figure 2: List of isolation protocols

**Listeria Isolation Methods**

**FDA method**
- Listeria Enrichment Broth
- or Buffered Listeria Enrichment Broth

**ISO 11290 method**
- Primary Enrichment Medium
- or Half Fraser Broth
- or UVM 1 Broth

**USDA method**
- Primary Isolation Medium
- or PALCAM Agar or LMBA
- or Confirmatory Tests
  - Biochemical strip
  - or Latex Agglutination

### REFERENCES


7. ISO 11290-1:1997 (Microbiology of food and animal feeding stuffs - Horizontal method for the enumeration of Listeria monocytogenes - part I, Incorporating Amendment 1.)