

Poster

THE ROLE OF OFFICIAL CONTROL IN IDENTIFYING THE FOOD SOURCE IN A FATAL CASE OF LISTERIA MONOCYTOGENES LISTERIOSIS

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Objective. To demonstrate how the integration of epidemiological investigation, official food control, and whole-genome sequencing enabled the identification of the food source of a fatal Listeria monocytogenes infection, highlighting the added value of a multidisciplinary "One Health" approach.

Methods. Following a human death due to listeriosis, an epidemiological investigation conducted using a questionnaire for the daughter on dietary habits during the final two weeks of life of the patient identified the consumption of fresh salami as a possible source of exposure. The veterinary food hygiene service, as the local competent authority, inspected the production facility and collected samples from surfaces, equipment, and the salami itself. After L. monocytogenes was detected in salami, production areas were inspected, the HACCP plan was obtained and official actions were taken pursuant to Regulation (EU) 2017/625, such as the issuance of prescriptions and official hold of the batch involved. Isolates obtained from food and clinical samples underwent genomic characterization to assess the epidemiological link.

Results. The inspection showed generally satisfactory hygienic conditions, although minor structural deficiencies required corrective actions. The positive sample belonged to a batch different from and produced after the one consumed by the deceased. The label identified the product as ready-to-eat salami, pH 5.6 and water activity (aw) 0.95 measurements indicated favorable conditions for L. monocytogenes growth. According to Regulation (EC) 2073/2005 these physico-chemical parameters classify the product under Food Safety Criterion 1.2 (ready-to-eat foods able to support the growth of L. monocytogenes).Because the producer lacked challenge test data demonstrating compliance with the 100 CFU/g limit throughout shelf life, the regulatory limit of "absence in 25 g" applied before the food has left the immediate control of the food business operator; consequently, the detection of L. monocytogenes represented an explicit regulatory non-compliance. Although the bacterial count was<10 CFU/g, the sampled product was still undergoing curing. The HACCP plan established two food safety criteria for the salami product: one for products with aw<0.92, with a critical limit based on the presence of L. monocytogenes in 25 g; and another for products with aw≥ 0.92, with a limit set at 100 CFU/g of L. monocytogenes. A genomic correlation study based on the cgMLST Institut Pasteur scheme (1,748 genes, 7-allele threshold) conducted by IZSAM confirmed a link between the clinical strain and two salami isolates. Their close genetic relationship provided significant evidentiary value. This led to judicial proceedings and the seizure of the products under Article 354 c.p.p., for violations of Article 5 of Law 283/1962 and Article 444 c.p. The pork products shared the same farm and slaughterhouse supply chain. While two isolates were closely related, tracing back to a common environmental or fecal contamination source during processing, a third isolate belonged to a different serotype, indicating a distinct origin.

Conclusions. This investigation demonstrates the importance of a coordinated One Health approach integrating epidemiological surveillance, official food control and WGS for foodborne diseases management. Confirming the genomic link between food and clinical isolates enabled robust source attribution. Operational efficiency was validated by a tight timeline: the questionnaire was administered 4 days after death and 49 days elapsed between food sampling and definitive WGS correlation. This rapid flow of information highlighted the strategic role of integrated supply chain controls and timely collaboration among veterinary services, official laboratories and public health authorities. These findings support the use of multidisciplinary investigations to strengthen foodborne disease surveillance, inform risk management decisions and improve public health protection.

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