

PREVALENCE OF *LISTERIA MONOCYTOGENES* IN READY-TO-EAT FOODS IN BULGARIA

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Abstract

Listeria monocytogenes is a widespread foodborne pathogen, which is able to grow and survive even at refrigeration temperatures, in vacuum-packed food and in modified atmosphere. It is also often found as an environmental contaminant in food processing plants. Important sources of *L. monocytogenes* are different ready-to-eat (RTE) products with a long shelf life. RTE are also known as products which support the growth of *L. monocytogenes*. The microbiological criteria for *L. monocytogenes* in foodstuffs are specified in Commission Regulation (EC) No 2073/2005. For RTE foods which are able to support the growth of the pathogen, absence in 25 g of the product is required at the end of the production, if the manufacturer is not able to prove that the bacterial counts in the product will not exceed the limit of 100 cfu/g throughout the shelf life.

During the period from 01.05.2011 to 30.04.2012, in Bulgaria a program for monitoring the prevalence of *L. monocytogenes* was performed. The monitoring involved three categories of RTE foods - gravad and smoked fish, soft and semi-soft cheeses and heat-treated meat products. The monitoring program was a part of the European baseline survey on the prevalence of *Listeria monocytogenes* in certain ready-to-eat foods at retail in the EU, 2010 - 2011 (Commission decision 2010/678/EC). A total of 367 samples were taken from three categories of RTE foods - packaged (not frozen) hot or cold smoked or gravad fish (2 × 122 samples, i.e. duplicates from the same batch), soft and semi-soft cheeses (63 samples) and packaged heat-treated meat products (60 samples). The samples were examined qualitatively according to ISO 11290 part 1:1996 and quantitatively according to ISO 11290 part 2:1998. From the fish products duplicate samples were taken and one of the samples was analyzed within 24 h after arrival at the laboratory, whereas the other one was kept refrigerated at the temperature indicated on the label and was examined at the end of the shelf life. The meat products and the cheese samples were tested only at the end of the shelf life. The fish samples were also analyzed for pH (according to ISO 2917:1999) and water activity (according to ISO 21807:2004) immediately after they had been received at the laboratory.

L. monocytogenes was detected in 12.3% (15/122) of the fish samples analyzed at the day of receiving and in 8.2% (10/122) of the samples at the end of the shelf life. The highest prevalence of *L. monocytogenes* was found in cold smoked fish and lower - in gravad and hot smoked fish. *L. monocytogenes* was not detected in any of the meat products and cheese samples. Levels of *L. monocytogenes* exceeding 100 cfu/g were found in three (2.5%) of the fish samples analyzed at the day of receiving at the laboratory and in one (0.8%) of the samples tested at the end of the shelf-life. The presented data were statistically processed by Student's *t*-test.

L. monocytogenes was found only in RTE fish products (15 isolates). The maximum level of 100 cfu/g was surpassed in only three of the cases.

Key words: *Listeria monocytogenes*, Ready-to-use foods (RTE), European Baseline survey.