

CAMPYLOBACTER SPP. AND LISTERIA MONOCYTOGENES IN ESTONIAN FOOD CHAIN

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INTRODUCTION: Human listeriosis is a relatively rare but serious zoonotic disease which can be life threatening to vulnerable populations, especially to elderly persons, pregnant women, and persons with weakened immune systems. High prevalence and numbers of *L. monocytogenes* are often linked to certain food items, such as soft cheeses, blue mould cheeses, smoked fish, paté, deli-meats, unpasteurized milk, fermented raw-meat sausages, non-re-heated frankfurters, hot dogs, deli-salads and some other foods, especially with RTE foods. *L. monocytogenes* in RTE food indicate a direct risk for human health, especially for vulnerable population. Findings over the legal safety limit, which is in most cases above 100 CFU/g during the self-life of a RTE product, have been mostly reported with cheeses, fishery and meat products.

Campylobacters are the most common registered bacterial causes of human intestinal infections in many countries. It is well established that poultry products are a vehicle for foodborne campylobacteriosis and they are suspected to be an important source of infection because of the frequent contamination of poultry meat at retail level. Over 90% of all commercial broiler production in Estonia is coordinated through one company from three separately located farms, all together 60 flocks in separate housings, approximately 20.000 birds per herd.

Study from 2008 to 2010 was planned to estimate the prevalence of *L. monocytogenes* in various foods of Estonian origin with special reference to ready-to-eat (RTE) foods. Additionally, the detection of the prevalence of *Campylobacter* spp. in fresh broiler chicken meat products sold in Estonian retail outlets was performed. Regarding to previous tasks, the main aim of the current study was to determine the *Campylobacter* spp. and *Listeria monocytogenes* prevalence in Estonian food chain.

RESULTS AND DISCUSSION: In 2008-2010, a total of 2.6% of 21,574 various food samples of the Estonian origin were positive for *L. monocytogenes*. It was found that *L. monocytogenes* contamination was higher in raw meat and raw meat products (18.7%), raw mixed salads (18.5%) and in raw milk (18.1%) compare to raw fish products (8.8%). Among RTE fish products, cold-smoked fish products were most frequently contaminated with *L. monocytogenes* (32.9%). Generally, the counts of *L. monocytogenes* in tested products remained under 10 colony forming units (CFU) per gram of product. Only 2.9% and 0.8% of the RTE fish products contained *L. monocytogenes* in range of 100-1000 CFU/g and >1000 CFU/g at the end of shelf life. Our study in 2008-2010 showed that the prevalence of *L. monocytogenes* in various RTE food categories, in spite of higher prevalence among raw products, was generally low in Estonia.

In 2012 the new project of the Estonian Scientific Council (ETA-g 9315) "Molecular epidemiology of *Listeria monocytogenes* and *Campylobacter* spp. in Estonian food chain"

started and according to preliminary data from 9-months study period (from January to September 2012) the prevalence of *Campylobacter* spp in fresh broiler chicken meat was 33.8% from the total of 160 analysed samples. The percentage of *Campylobacter* positive samples among Estonian and Lithuanian fresh broiler chicken meat products available in Estonian retail markets was 17.8% and 50%, respectively. The *Campylobacter* counts were from $<1.0 \times 10^1$ to 2.0×10^4 per gram of product with the lowest counts in Estonian and highest in Lithuanian fresh broiler chicken meat products. The final *Campylobacter* prevalence data within the ETA-g 9315 project will be known at the end of the year 2012 when 12-months lasting *Campylobacter* prevalence study will be summarized.

Listeria monocytogenes prevalence in Estonian RTE meat and fish products within 9-months study period in 2012 was 11.7% and only in one fish product with low salt concentration the number of *L.monocytogenes* exceeded the legal safety limit 1.0×10^2 per gram of product at the last day of product self-life. In average 90% of the Estonian RTE meat and fish products had *L.monocytogenes* counts less than 1.0×10^1 per gram of product. The final data about the *L.monocytogenes* prevalence in Estonian RTE food products in 2012 and 2013 will be known at the second half of the year 2013 when the *L. monocytogenes* 18-months lasting prevalence studies will be summarized.