**Prevalence and pathogenic potential of *Escherichia coli* isolated from a dairy production chain in Piedmont, Italy**

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**ABSTRACT**

Objectives: The presence of *Escherichia coli* was investigated along a dairy production chain comprised in a small geographical area. Twenty farms were selected that conferred the milk to a single dairy plant producing an Italian blue veined cheese. Different samples were collected to identify putative dissemination pathways and assess the pathogenic potential of *E. coli*.

Materials and methods: Samples from milk, milking filters, feed and cattle feces were collected on four sampling rounds. All samples were tested to detect *E. coli*, O157:H7 and extended-spectrum β-lactamases (ESBLs) producing strains. PCR was used determine phylogenetic groups and investigate the presence of 6 intestinal and 8 extra-intestinal virulence factors.

Results: A total of 329 samples was collected: feces (n=74), milking filters (n=73), maize silage (n=70), unifeed (n=65), and milk (n=47). E. coli was detected in all feces samples; in 52% of milking filters, 6% of maize silage and 1,5% of unifeed. Milk samples were always negative. Among the 288 confirmed *E. coli* isolates, O157:H7 and ESBL-E. coli were never detected. Phylogroup A grouped 228 isolates (79%), while 39 were in B1 (14%) , 12 in D (4%), and 9 in B2 (3%). We detected the intimin gene in 13 isolates (4,5%, representing 8 samples); hemolysin in 11 isolates (3.8%, 8 samples); heat-stable enterotoxin and verotoxin 2 in one isolate each, respectively (0,3%). Isolates belonging to B2 and D were tested for the presence of extraintestinal virulence factors and six isolates were defined as extraintestinal pathogenic *E. coli*.

Conclusions: The presence of *E. coli* in milking filters and feed suggests that fecal contamination might have occurred. Even if Good Agricultural Practices (GAP) and Good Hygienic Procedures (GHP) are in place, occasional dissemination of the microorganism can still occur. Thus, primary producers should regularly be made aware of the importance of GHPs. In spite of a high detection rate of *E. coli*, the prevalence of pathogenic *E. coli* in the tested population was limited. These findings suggest that the considered production chain can be considered 'safe' in respect to the general *E. coli* population.