

A Nationwide Outbreak of *Salmonella* Bovismorbificans Associated with Sprouted Alfalfa Seeds in Finland, 2009

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Summary

Salmonella enterica serotype Bovismorbificans is a rare serotype in Finland. In June 2009, a nationwide outbreak of *S. Bovismorbificans* infections occurred, and 42 clinical isolates were identified. We conducted a case–control study enrolling 28 cases and 48 matched controls, and found ready-to-eat alfalfa sprouts associated with the infection (odds ratio = 35.2, 95% confidence interval 2.8–435). The sprouts were traced back to a domestic producer, with the seeds originating in Italy. Although finding microbiological evidence for sprouts as a source of this outbreak was very challenging, *S. Bovismorbificans* was finally found in sprouts germinated in the laboratory, and in soaking and rinse waters during the germination process. The pulsed field gel electrophoresis showed that these isolates were identical to the human outbreak isolates. Before sampling, it is important to mix the seeds well and to take several large-size samples from different seed lots. Instead of analysing seeds, the analysis should be targeted to soaking or rinse water samples and to the sprouts germinated in a laboratory. Accordingly, the sprout producers should only buy seeds that have been analysed for *Salmonella*. The producers have to include *Salmonella* testing in their internal quality control to ensure that *Salmonella* is absent from sprouts placed on the market during their shelf-life. In order to reduce the health hazard caused by sprouts, an effective and safe decontamination procedure should also be developed for the seeds.