Efficacy of domestic cooking of experimentally infected bivalve shellfish: A case study

Michela Favretti¹, Pezzuto A², Piovesana A¹, Boffo L² and Mioni R¹

¹Istituto Zooprofilattico Sperimentale delle Venezie, Italy
²Veterinarian, Food safety consultant, Italy

Bivalve shellfish filter large volumes of water and in addition to retaining food particles they can accumulate chemical and biological contaminants from their surrounding environment. The consumption of raw or lightly cooked molluscs represents a health risk due to the possible presence of Escherichia coli, Vibrio spp., norovirus, hepatitis A virus, Salmonella and other pathogens, which could be present in the marine environment as result of fecal contamination. The present study was aimed to validate the instructions for domestic cooking to be labeled on clams (Tapes semidecussatus) and mussels (Mytilus edulis) in order to reduce or eliminate microorganisms artificially inoculated in the bivalve shellfish. A mix of Salmonella Senftenberg, Escherichia coli and Vibrio parahaemolyticus was dissolved in a bin containing 70 liters of sea water collected from the harvesting area of clams and mussels, and kept at 15°C; the bivalves were dipped in the contaminated water for 90 minutes. Inoculated microorganisms were counted in sea water before the immersion of molluscs, and in bivalve samples at the end of dipping time to verify the contamination levels. The absence of the same bacteria in non-contaminated bivalves (negative controls) was also confirmed. Contaminated clams and mussels were cooked in a pan with cover for 5 minutes once a temperature of 90°C was reached as suggested by the producer. At the end of the set time all the clams and mussels had opened valves; immediately they were shelled and pooled to be tested for the surviving microorganisms. The experiment was repeated in two sessions and two different batches of molluscs were used. The findings confirmed the total inactivation of artificially inoculated microorganisms in both bivalve species if cooked at 90°C for 5 minutes; so this time-temperature combination represents correct cooking instructions that can be labeled and guarantees a safe consumption of bivalve shellfish at domestic level.

Recent Publications:


Biography

Michela Favretti graduated in Veterinary Medicine in 2001 from the University of Padua. She is specialized in “farming, hygiene, disease control of aquatic species and related products” (2005, University of Padua). She is currently a Veterinary Manager and Quality Manager at the IZSVe laboratory in San Donà di Piave (Venice). Her fields of interest are food safety, microbiological analysis of foodstuffs and the simplified own-check systems to control hygiene. Her research interests include food safety, the promotion of local traditional products, simplification of the own-check system to control hygiene in small businesses (bars, restaurants, butchers, fishmongers, etc.) and small dairies. She is also a Trainer for food industry professionals and trade associations. She drafts guides of good manufacturing practices for small local producers about vegetables, fresh and processed meats, honey, milk and dairy products, processing in alpine hut.

mfavretti@izsvvenezie.it