

TITLE: COMPLIANCE WITH FOOD SAFETY CRITERION FOR *ESCHERICHIA COLI* ON LIVE BIVALVE MOLLUSCS MARKET IN SARDINIA (ITALY)

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ABSTRACT

Food safety criterion for *Escherichia coli* on live edible bivalve molluscs are laid down by European regulation (EC) No 2073/2005, amended by regulation (EU) 2285/2015. For bivalve molluscs placed on the market microbiological criteria are satisfied if no more than 20% of the samples contain *E. coli* between 230-700 MPN/100 g, while the remaining 80% do not exceed 230 MPN/100 g. The aim of this study was to verify the compliance with foods safety criterion for *E. coli* in edible bivalve molluscs marketed in Sardinia, Italy. From 2017 and 2019 a total of 730 bivalve molluscs samples including 650 mussels, 30 clams and 50 oysters were collected at wholesale market (n. 445) and retail stores (n. 285) from 8 provinces of Sardinia. Each sample comprised respectively 10 mussels, 20 clams or 5 oysters (EN/ISO 6887-3). The enumeration of *E. coli* was conducted on 100 g of sample using the Most Probable Number (MPN) method (ISO 16649-3). Compliance to microbiological criteria was evaluated at batch level on 5 bivalve molluscs samples. Fisher's exact test was conducted to determine the association between batch compliance to microbiological criteria (yes or no) and mollusc species, season, and type of market (wholesale or retail). Of all samples, 703 (96.30%) were below 230 MPN/100 g, 12 (1.64%) were between 230-700 MPN/100g, while 15 (2.05%) were above 700 MPN/100 g. Marginal (>230-<700 MPN/100 g) and unsatisfactory (>700 MPN/100 g) values were observed only in mussels. Clams and oyster samples showed always satisfactory values (≤ 230 MPN/100 g). Out of 12 mussel samples with marginal *E. coli* values, 7 (58.3%) originated from wholesale market and 5 (41.7%) from retail stores. Out of 15 mussels samples with unsatisfactory values, 5 (33.3%) originated from wholesale market and 10 (66.7%) from retail stores. Compliance with microbiological criteria was assessed on 146 molluscs batches (130 mussels, 6 clams, and 10 oysters). Compliance was observed in 140 batches (95.89%) while non-compliance was observed in 6 batches (4.11%). The percentage of non-compliant batches was different between fall (7.9%, n. 3/38) and spring (9.4%, n.3/32) ($P < 0.05$). No significant association was observed between non-compliant batches and mussels species and type of market ($P > 0.05$). Overall, the edible molluscs marketed in Sardinia demonstrated a high microbiological quality and compliance with European Union criteria.

Keywords: Food safety; Microbiological criteria; Shellfish.

Development Agency: CAPES PRINT Project, 88881310254/2018-01