REVIEWS IN Aquaculture

Reviews in Aquaculture (2017) **0**, 1–9 doi: 10.1111/raq.12222

A critical analysis of the international legal framework regulating the microbiological classification of bivalve shellfish production areas

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Received 8 May 2017; accepted 11 September 2017.

Abstract

This study presents a review of the microbiological standards and associated monitoring practices for classification of commercial shellfish production areas in force in Brazil, European Union and United States of America. The classification systems are not immediately comparable principally because some regulations are based on the monitoring of water and others of shellfish flesh. To create a common baseline to compare these regulations, regression models were developed based on monitoring data and used to correlate levels of faecal indicator bacteria in water and in shellfish. The classification system used in the European Union was found to provide the highest level of shellfish safety for classification categories that do not require post-harvest treatments prior to marketing, while the United States system provides higher level of shellfish safety for classification categories that require these treatments. The Brazilian legislation prescribes depuration as the post-harvest treatment for shellfish with much higher levels of coliforms than the United States and European Union systems. Evidence was found that the microbiological limits for sea water set out in the Brazilian Resolution 357 – CONAMA are more stringent than the regulations used in the European Union and United States. The results also suggest that the Brazilian Shellfish Sanitation Programme and the European Union legislation are the least stringent concerning maximum faecal contamination tolerated. This assessment provides information on margins of safety for shellfish products traded internationally.

Key words: brown mussels, coliforms, human health, international trade, legislation, shellfish safety.

Introduction

Filter-feeding bivalve molluscan shellfish accumulate micro-organisms, including human pathogenic bacteria and viruses, when grown in sewage-polluted waters and can present a significant health risk when consumed raw or lightly cooked (Lees 2000; Butt *et al.* 2004). To reduce the risk of human illness, many countries have implemented public health controls on the commercial production and/or recreational gathering of shellfish (Murray & Lee 2010). Essentially, these controls consist of monitoring faecal indicator organisms (FIOs) in shellfish and/or water and classification of production areas based on the results of this monitoring followed, where required, by post-harvest treatments (depuration, relaying, heat treatment) prior to sale for human consumption (WHO, FAO, 2012). The classification of production areas provides an indication of the potential risk of contamination by pathogens.

International shellfish sanitation programmes in the Western world usually adopt one of two basic approaches with respect to the type of sample. The approach used in the European Union (EU) and countries with trade agreements with the EU adopts the monitoring of FIOs in shellfish flesh while the approach used in the United States of America (USA) and countries with a memorandum of understanding with the US classify production areas based on monitoring of FIOs in surface waters. Some countries that export shellfish to the EU and/or the USA have

