Bacteriological quality and safety of raw milk in Malaysia

Abstract

The microbiological safety of raw milk from 360 dairy farms in Peninsular Malaysia was determined. Milk samples were collected at 40 Milk Collection Centers (MCC) from four regions, namely, Southern (Johor/Melaka), Central (Selangor/Negeri Sembilan), Northern (Perak/Kedah) and Eastern (Kelantan/Terengganu) according to stratified random sampling design. Samples were analyzed for Total Plate Count (TPC), Staphylococcus aureus, coliform and Escherichia coli as well as the prevalence of selected pathogens such as Listeria monocytogenes, E coli O15:H7 and Salmonella. The mean counts per ml for TPC, psychrotrophs and thermophiles were 12×10^{6} 7.5×10^{3} and 9.1×10^{3}, respectively. A TPC less than 10^{6} cfu ml^{-1} is used as a basic standard by MCC in the Price Incentive Programme. From the 930 milk samples tested, approximately 90% were contaminated by coliform bacteria and 65% were E. coli positive, with mean counts ranged from 10^{3} to 10^{4} cfu ml^{-1}. S. aureus was isolated from more than 60% of the samples and the mean count per ml was 12×10^{3}. Meanwhile, E coli O157:H7 was also detected in 312 (33.5%) samples. However, Salmonella was only detected in 1.4% of the samples, with the Central region having the highest frequency of isolation. Thirteen Salmonella serotypes were identified, including S. muenchen, S. anatum and S. agona. A total of 47 strains of Listeria were isolated from 4.4% Listeria-positive samples including L. monocytogenes (1.9%), L. innocua (2.1%) and L. welshimeri (0.6%). (C) 2003 Elsevier Ltd. All rights reserved.