Bactericidal Effect of Fermented Milk against Food Poisoning Bacteria

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Abstracts

To investigate antibacterial action of fermented milk against food-poisoning bacteria, overnight culture of Salmonella serotype Enteritidis NIHJ G14 (SE), Salmonella serotype Typhimurium LT2 (ST) and clinically isolated Vibrio parahaemolyticus V17 (VP) cells were incubated at 37 ºC with a liquefied yoghurt product and survival of the cells were monitored by CFU assay. Viable SE cells in the product dramatically decreased by 2 logs after 2 h incubation and could not be detected at 4 h incubation. The product also showed bactericidal effect against ST cells. Decline rate of the cells was faster than that of SE. Bactericidal effect of fermented milk against VP was further remarkable because the viable VP cells could not be detected within 5 min. These bactericidal activities were not affected when lactic acid bacteria in the product were completely inactivated by heating or removed by membrane filtration. On the other hand, SE, ST or VP cells in neutralized samples slightly grew in the early stage of incubation, then reversed themselves to decline rapidly by production of organic acids including lactic acid by lactic acid bacteria in the product. The skim milk solution whose pH was adjusted at 4.0 by lactic acid, also exhibited bactericidal activities against these bacteria. However, this phenomenon was not obvious when pH of the skim milk solution was adjusted by hydrochloric acid instead of lactic acid. These results suggest that free form of lactic acid molecule is a major factor of the potent bactericidal activity and affects viability of the cells. This molecule must permeate into bacterial cells through cell membrane and perturb cellular pH to become acidic. Furthermore, the fermented
milk samples represented a marked zone of inhibition against *Staphylococcus aureus* by an agar-diffusion method. Taken together, the fermented milk must exhibit bactericidal activity against broad spectrum of bacteria.