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Elimination of Antibiotic Resistant Bacteria in Livestock Feces during Manure Processing

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Antibiotic resistant bacteria in livestock feces will become a cause of community acquired infection, if organic manure originated from livestock feces were applied to fields without elimination of resistant bacteria. As the fecal bacterial flora in the feces changes into non-fecal flora during manure processing, antibiotic resistant bacteria in livestock feces can be eliminated by this process. In order to search the way to eliminate the resistant bacteria effectively, changes of multidrug resistant bacterial flora in livestock feces were monitored by identifications using MERFLP after cultivation of diluted samples in LB medium under antibiotics (streptomycin 25 mgL⁻¹, chloramphenicol 25 mgL⁻¹ and ampicillin 25 mgL⁻¹) and quantifications using MPN. Total numbers of multidrug resistant bacteria in cattle feces (3.5×10^7 MPN/g and 5.9×10^6 MPN/g), which included *γ*proteobacteria and Firmicutes as numerically dominant one and *Chlamydia psittaci*, *Chlamydomydia pneumonia* and *Leptotrichia buccalis* as typical fecal one, decreased to undetectable level after thermophilic phase (4 weeks). Total numbers of multidrug resistant bacteria in pig feces (from 3.1×10^4 MPN to 3.6×10^5 MPN/g), which included *Mycoplasma capricolum*, *Campylobacter jejuni* and *Prevotella intermedia* as typical fecal one, did not decrease after thermophilic phase (from 2.7×10^5 MPN to $>6.5 \times 10^5$ MPN/g), but decreased (from undetectable to 5.0×10^4 MPN/g) after maturing process (3 Months). Decrease in water content of starting materials (54.5%-69.3%) after maturing process (24.0%-41.8%) might cause a decrease in resistant bacterial number. Although total bacterial numbers after maturing process remained as same as those in these feces, fecal flora of total bacteria in these feces changed to non-fecal flora after maturing process.

Biography:

Dr. Katsuji Watanabe is a Ph. D; Department of Bioscience and Biotechnology, Faculty of Agriculture, Kyushu University, Japan (April/1986). A Postdoctoral researcher (October/1986-March/1987) He was a researcher (April/1987-March/1991); Senior Researcher (April/1991-March/2010) from National Agriculture and Food Research Organization, Japan. Later he became the Visiting researcher (OECD co-operative research programme) at Institut für Boden Biologie, FAL, Germany (December/1994-May/1995). He also worked as a Visiting researcher (OECD co-operative research programme) at Center for Microbial Ecology, Michigan State University, USA (December/2000-May/2001). And a Visiting professor from Faculty of Agriculture, Tokai University, Japan (April/2006-March/2010) And is presently Professor; Department of Life, Environment and Applied Chemistry, Faculty of Engineering, Fukuoka Institute of Technology, Japan.