In Vitro Effects of Oligosaccharides on Bacterial Concentration and Fermentation Profiles in Dairy Calf Colon Content

L. Hendraningsih¹, C. Sutrisno², J. Ahmadi², A. Muktiani², and B. Sulistyanto²

¹Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang, Malang, Indonesia
²Faculty of Animal Science and Agriculture, University of Diponegoro, Indonesia
Email: listiari_h@yahoo.co.id

ABSTRACT

Some oligosaccharides have been shown to modify colonic micro flora composition and activity in many humans and some animal species. Some oligosaccharides tend to elevate beneficial bacteria and the others depress harmful bacteria in gastrointestinal tract. However, little data are available on their fermentation characteristics by the ilea microbial community, and their effects on the colon micro flora composition. The aim of this study was to evaluate the in vitro effect of oligosaccharides from apple and banana peel extraction and mannan-oligosaccharide (MOS) commercial on concentrations of the total anaerobic bacteria, Bifidobacterium, Lactobacilli, Coliform and Escherichia coli population in dairy calf’s colon contents. Two groups of 2 calves fed a milk replacer (1 week old) and fibrous pellets (3 weeks-old) were sacrificed 5 h after the morning meal. In each group, colon content were pooled and diluted with, diluted by Lowe medium. Extraction of apple, banana peel, and MOS were tested in vitro versus a control. Each bottle was incubated in duplicate for each treatment and at 37°C in a shaking water bath. Bacterial concentrations were determined at 48 H and inoculated in selected media for each bacteria group and supernatant were taken for fatty acids (VFA) measurement. Result showed in general, oligosaccharides were not resulted VFA concentration than control bottle in both groups even tend to inclined, specifically banana peel. Apple peel and banana peel slightly increase total anaerob and lactobacilli in both group but could not depress the E. coli. On the other hand MOS seems the most effective in depressing coli. Based on our results, oligosaccharides were fermented by bacteria of ilea contents in dairy calves and its fermentation led to a selective stimulation of host bacteria.

Key Words: Oligosaccharides, Dairy Calf, Colon, Selective Media