

Massalin Nakphaichit 2012: Application of Molecular Technique to Monitor Microbial Change in Chicken Gastrointestinal Tract. Doctor of Philosophy (Biotechnology), Major Field: Biotechnology, Department of Biotechnology. Thesis Advisor: Associate Professor Sunee Nitisinprasert, Ph.D. 131 pages.

To understand the effect of intestinal microbiota on healthy chicken, pyrosequencer was applied to determine microbial community according to V6-V8 region of 16s rRNA sequences. In ileum, the dominant bacteria were belonged to lactic acid bacteria group including *Lactobacillus*, *Leuconostoc* and *Weissella*. While high population of those strictly anaerobic group *Lachnospiraceae Incertae Sedis*, *Subdoligranulum* and *Faecalibacterium* were dominant in cecum. During growing state (28 d) and finisher state (42 d), microbial population in each region were similar. However, pyrosequencing was expensive for poultry industry and limited in quantification assay. Optimization of high resolution melting analysis (HRM) for bacterial identification was studied. This technique well distinguished for only two bacterial groups which was not appropriate to analyze the microbial abundance in intestine. The intestinal microbiota was sensitive to various stress treatments. Two exogenous factors of probiotic and high protein content were proposed in this study. The effect of probiotic strain *Lactobacillus reuteri* KUB-AC5 fed on newborn for first week of broiler chicken were analyzed. This strain significantly enhanced population level and species diversity of lactobacilli in ileum at day 42. In addition, the suppression of *Proteobacteria*, including nonbeneficial bacterial groups were observed. Another factor of high crude protein (CP) from soy bean meal and essential amino acid (EAA) affecting gut microflora at 21 d and 35 d were carried out. These enrichments increased the amount of *C. coccoides*–*E. rectal* group for two times in ileum compared to the control and suppressed the growth of *Campylobacter* group in cecum as well. Moreover the increasing of lactic acid production in high CP treatment was observed. These changes of gut microflora due to the effect of external factors would be helpful for poultry industry in the future.

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