

## **The effect of including *Lactobacillus reuteri* KUB-AC5 during post-hatch feeding on the growth and ileum microbiota of broiler chickens**

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**Abstract:** The probiotic strain *Lactobacillus reuteri* KUB-AC5, which was originally isolated from chicken intestine, was fed to newborn broiler chicks for the first week post-hatch. The growth and ileum microbiota of the chickens were carefully monitored for 6 wk. The inclusion of 5 log cfu/g of feed statistically increased the BW gain in the first week compared with that of the control group, but this effect did not continue thereafter. Significant effects on host feed consumption and the feed-to-growth conversion ratio were not detected. The total amount and composition of ileum bacteria were investigated by quantitative PCR and pyrosequencing of the 16S rRNA gene (rDNA), respectively, and were compared between the control and the probiotic-treated groups. The amount of total bacterial 16S rDNA in ileum samples at d 42 was 5 times higher in the probiotic group than in the control, whereas no significant difference was observed at d 21. A composition analysis revealed the establishment of lactobacilli-enriched microbiota in the probiotic-treated chickens at d 42. At this point, the population level and species diversity of lactobacilli were significantly enhanced compared with those of the control group. In addition, Actinobacteria, mainly genera *Corynebacterium* and *Dietzia*, were also statistically higher in the probiotic group. However, Proteobacteria, including those of the family Campylobacterales and some other nonbeneficial bacterial groups, were decreased in the probiotic group at the growing stage. Therefore, with probiotic supplementation, it was demonstrated that *Lactobacillus reuteri* KUB-AC5 in the early post-hatching period had a delayed effect on ileum microbiota, which resulted in the enrichment of potentially beneficial lactobacilli and the suppression of Proteobacteria, including nonbeneficial bacterial groups.

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