

学 位 論 文 要 旨	
氏 名	Kumiko Hioki
題 目	Study on the extra-brewing use of koji -Utilization as functional feed and food- (麴の醸造外利用に関する研究 —特に機能性飼料および機能性食品としての利用—)
<p>The major aim of the present study was to search extra effective ways to use black koji (<i>Aspergillus luchuensis</i>) other than brewing. Koji has been mostly used for brewing since more than one thousand years ago.</p> <p>This study is consisted of three sections. 1) The effect of a mixed culture of black koji and lactic acid bacteria (<i>Lactobacillus casei</i>) on intestinal microflora in broiler. 2) The effect of black koji on performance in growing finishing pigs. 3) The possibility of black koji as a supplementary use for human diet.</p> <p>1) A mixed culture of black koji and lactic acid bacteria was fed to broiler to evaluate the effect on performance, living microorganism counts and organic acids concentrations in the gastrointestinal track. Body weight gain was increased ($p=0.064$) and lactic acid bacteria counts in the cecum were significantly increased by the culture feeding. Citrate, lactate, acetate and propionate concentrations in the cecum were higher and butyrate concentration tended to be higher ($p=0.079$) in the test group. Total organic acids content was significantly increased by the culture. These results show that feeding the mixed culture modifies microflora followed by increasing intestinal organic acids and improves the performance in broiler.</p> <p>2) Effects of black koji and a mixed culture of black koji and lactic acid bacteria on performance in growing finishing pigs were evaluated. Black koji tended to increase body weight gain and significantly lowered feed conversion ratio. And the mixed culture improved body weight gain and feed conversion ratio more than black koji. These results show that the performance of growing-finishing pigs can be significantly improved by black koji and the mixed culture of black koji and lactic acid bacteria.</p> <p>3) To explore the possibility of black koji as a supplement for human diet, black koji and a fermented tea using black koji were given to rats. Although the previous experiments showed a significant effect of black koji on lipid metabolism in rats fed diets of high fat (butter) content, the effect was not clear in the present study. However, m-RNA expression of liver acetyl CoA carboxylase was significantly reduced by black koji and tended to be reduced by the fermented tea. Cecal lactate concentration was significantly increased by black koji and tended to be increased by the fermented tea. From the previous and the present results, I hypothesized that black koji can reduce fatty acids synthesis and improve lipid metabolism especially in animals fed diets with high saturated fatty acids content. Moreover, it was indicated that a combination of green tea and black koji can be an effective supplement for human diet.</p> <p>In conclusion, black koji can be effectively used as a functional feedstuff and a supplement to enhance human health.</p>	