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EFFECT OF RESTRICTED FEEDING ON TASTE-ACTIVE COMPONENTS, FREE GLUTAMIC ACID AND 5'-IMP, OF CHICKEN MEAT

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Backgound:

Dietary nutrients play a significant part in determining growth rate and meat yield. It is known that the compositions of protein and total amino acid of meat are invariable by feeding treatments, hence the meat taste is considered to be invariable. However, the relation of taste components of meat with nutrients was not fully elucidated, and there have been few reports on the effect of feeding treatments on taste-active components of chicken meat.

Objectives:

In this study, the relation of feeding conditions with taste components in chicken meat extract was studied, especially focusing on the taste-active components. Three experiments were conducted, Experiment 1: meat type chickens were fed 1/2 of the control group for 5 weeks, and the meat composition, protein, lipids, free amino acids and ATP metabolites, was measured. Experiment 2: to see the time course of restricted feeding on taste components of meat, taste components were measured every 2 days for 14 days. Experiment 3: meat taste was evaluated by sensory evaluation.

Materials and Methods:

Experiment 1: Female Cobb strain broiler chickens were divided into three groups with six chicks each, fed the diets formulated for 0 to 5 weeks age for 5 weeks and then the diets were switched to those for 6 to 8 weeks age for 3 weeks. In the control group, chicks were fed *ad libitum*,while in the restricted feeding group, chicks were fed half of the diet in control group. All the chickens were kept in individual wire cages. Protein, water, lipids, fatty acids and minerals of pectoral meat, and free amino acids, ATP metabolites and inorganic ions of the meat extract were measured. Experiment 2: The 49-days-old female Cobb strain broiler chickens were fed half of the diet in the control group for 14 days. Taste components of meat were measured at 0, 2, 4, 8, 10, and 14 days. Experiment 3: Pair test of sensory evaluation was conducted between meats of restricted and control groups.

Results and Discussions:

In Experiment 1, there were no differences in contents of water, lipids, ash, inorganic elements and fatty acids of broiler meat. No differences were found in the total amino acid contents in the meat among groups. However, in the meat extract, free Glu, Lys and Arg were decreased in the restricted feeding group. In Experiment 2, free Glu of meat was significantly decreased in

restricted feeding group, while 5'-inosinic acid (IMP) was tended to increase. Because free Glu contents of meat were above taste threshold value of Glu, these variations were considered to affect the meat taste. From sensory evaluation, the taste of the meat in restricted group was inferior to that in the control group. These results suggested that, taste-active components, especially free Glu, could be affected by restricted feeding treatment. The result was in accord with the analysis of synergistic effect with Glu and IMP of chicken meats, and considered that lowering of free Glu by restricted feeding mainly affect leads to the deterioration of meat taste.

Conclusions:

In order to elucidate the factors affecting taste of chicken meat, the effect of restricting dietary intake on broiler meat composition, *i.e.*, moisture, protein, lipid, ash, free amino acids, minerals, IMP and fatty acids, were studied using Cobb strain female broilers. As a result of this study, free Glu in the meat extract was variable by feeding, and IMP tended to increase by restricted feeding. Because the variation of the taste components decrease the meat taste, the feeding condition is one of the important factors affecting the meat taste of chickens.

Literature:

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