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Comparison of the Effects of Thyroxine and Triiodothyronine on Heat Production and Skeletal Muscle Protein Breakdown in Chicken

Kunioki Hayashi[1)], Hiroshi Kuroki[1)], Tomomi Kamizono[1)] and Akira Ohtsuka[1)]

1) Department of Biochemical Science and Technology, Faculty of Agriculture, Kagoshima University, Japan

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Effects of exogenous thyroxine (T4) and triiodothyronine (T3) were compared on heat production and skeletal muscle protein breakdown in broiler chickens aged from 15 to 27d. T4 and T3 were mixed in the basal diet at concentrations of 1.2, 3.6 and 10.8mg/kg and 0.3, 0.9 and 2.7mg/kg, respectively. Plasma T4 and T3 concentrations were increased dose-dependently by dietary T4 and T3, respectively, while plasma T3 concentration was not increased by dietary T4. Both T4 and T3 retarded growth and increased feed conversion at the higher dose levels while food intakes were not changed significantly. Relative skeletal muscle weights tended to be increased by T4 and T3 probably because body fat contents were decreased intensely by the treatments as indicated by the decrement of abdominal fat. Both heat production and muscle protein breakdown were increased in a dose-dependent manner by either T4 or T3, and the potency of T4 was about one fourth of that of T3. In conclusion, thyroxine is active and has roles in heat production and skeletal muscle protein breakdown.

Keywords: chicken, heat production, muscle protein breakdown, thyroxine, triiodothyronine

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