

The effect of intracerebroventricular injection of methylamine on food intake and its interaction with serotonin in neonatal meat chicks

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Received: 04.05.2020

Accepted: 01.08.2020

Abstract

Methylamine exists as an endogenous amine in the brains of birds and mammals, and on the other hand, it acts as a neuromodulator in the release of some neurotransmitters such as serotonin. The effects of methylamine have been well established in mice, but there is no evidence about the effect of methylamine on feeding behavior in poultry. So, the present study was designed to evaluate the effect of intracerebroventricular (ICV) injection of methylamine and involvement of central methylamine/serotonergic systems on feeding behavior in FD3 neonatal meat type chicks. In experiment 1, chicks were ICV injected with different doses of methylamine (15, 30, 45, 60 and 75 µg). In experiment 2, chicks received a dose of either the control solution, 75 µg methylamine, 1/5 µg PCPA (serotonin synthesis inhibitor) or a combination of methylamine plus PCPA. Experiment 3 was similar to experiment 2 except that 1/5 µg SB242084 (antagonist of HT₂C receptor) was used instead of 1/5 µg PCPA, respectively. Cumulative food intake was determined until 30, 60, 120 minutes post-injection. The volume of injections in each group was 10 µl. According to the results, methylamine significantly decreased food intake in a dose dependent manner. Therefore, the effective dose of methylamine was considered to be a continuation of the 75 µg test. It was also found that the hypophagic effect of methylamine by PCPA (inhibitor of serotonin synthesis, 1.5 µg) and SB242084 (antagonist of 5-HT₂C receptor, 1.5 µg) was significantly attenuated. These results suggest that methylamine has a hypophagic effect on food intake in broiler chickens, and that this reduction in methylamine-induced food intake is mediated by serotonin (a 5-HT₂C receptor).

Key words: Methylamine, Serotonin, Food intake, Chick

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