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Recent progress in exploring the essentiality of the non-metallic ultratrace elements fluorine and bromine to the nutrition of animals and man

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Abstract:

Fluorine-nondepleted rats and goats failed to show a significant influence of fluorine-poor nutrition on growth and reproduction performance. Intrauterinely fluorine-depletion over 11 generations of goats with 300 μg F/kg feed dry matter (DM) highlighted the essentiality of fluorine. They consumed significantly more feed, suffered from significant intrauterine and post-natal growth retardation, and had a significantly higher kid mortality rate. Old animals developed skeletal and joint deformities. Intrauterinely fluorine-depleted kids suffered from thymus hypoplasia. The normative fluorine requirement of animals (goats) is 650 $\mu\text{g}/\text{kg}$ feed DM, while that of humans amounts to 250 $\mu\text{g}/\text{day}$. The intake of less than 800 μg bromine (Br)/kg feed DM by goats caused a decrease in their feed intake, weight gain, conception rate, and especially their hemoglobin synthesis. Bromine-deficient goats possessed significantly higher triglyceride levels and gamma-glutamyl transferase activities in the blood plasma. The abnormal metabolism of lipids is a symptom of hypobromosis, which manifests itself in fatty hepatosis as well as lipomatosis of somatic muscles. The normative requirement could be 1000 to 1500 μg Br/kg feed DM for goats (animals) and 500 μg Br/day for adult man. The bromine requirements of animals and man are satisfied by food and water.

Key words: fluorine, bromine, essentiality to animals

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