

Research on the Salt Preference in Mineral Deficient Animals

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Summary

Impaired nutrient status caused by a bad eating habit has been considered a social problem. Minerals are one of the essential nutrients and their deficiencies cause many types of disorders. The abnormal NaCl preferences caused by mineral deficiencies have been reported in animal experiments (Okada *et al.*, 2012). In this study, we investigated the zinc-deficient animals in detail by behavioral physiological and physiological analyses to elucidate their pathological mechanisms of such taste abnormalities.

1. Analysis on the alteration of preferences for basic tastes in zinc-deficient rats by a brief access test

Brief access tests were performed to reveal the alteration of preferences for basic tastes by short term zinc deficiency. The zinc-deficient rats showed no alteration in preferences of bitter, sour and sweet taste substances after a 8-day dietary zinc deficiency. By contrast, they showed increased salt preferences for low concentration NaCl solution as well as high concentration one.

2. Analysis on the alteration of preferences for salts in zinc-deficient rats by a brief access test

Brief access tests were performed to reveal the alteration of preferences for 6 kinds of metal salts by short term zinc deficiency. The zinc-deficient rats showed increased preference for ZnCl₂ solution and no alteration of preferences for the other metal salts. These results indicate that the alteration of taste preferences are occurred specifically for NaCl and ZnCl₂ by short term zinc deficiency in rats.

3. Analysis on sodium and potassium balances in zinc-deficient rats

Balance tests of sodium and potassium were performed in short term zinc-deficient rats. Apparent retentions of sodium in their bodies were not different between zinc-deficient rats and their controls. Similarly, apparent retentions of potassium were not different. This result shows that sodium and potassium balances are not altered by short term zinc deficiency.

This study revealed that the taste preferences of short term zinc-deficient rats were altered specifically for NaCl and ZnCl₂. Detailed analyses on balances of minerals in the body might lead to the elucidation of this abnormalities of taste preferences.