

## Effects and Potential Mechanisms of Marginal Zinc Deficiency on Brooding Behavior and Salt Preference in Pregnant Rats

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### Summary

Zinc is known to be necessary for growth of the fetus. Therefore, adequate intake of zinc during pregnancy is recommended. The number of cases of potential zinc deficiency is increasing in Japan, because of unbalanced diet and disordered dietary habits. In addition, it has been reported that the number of underweight young women is particularly increasing in Japan. Therefore, one can reasonably speculate that the cases of marginal zinc deficiency of pregnant women may be increasing in Japan. It has been reported that zinc deficiency is related to infertility, prolonged labor, underweight infants and fetal death. Moreover, postnatal depression and nursing behavior of the mother may also be affected by zinc, as there have been several reports indicating the relation between depression and the amount of intake of zinc. In this study, we tested the effects of feeding low-zinc diet in pregnant rats on the state of delivery and brooding behavior. One-day pregnant SD female rats were divided into two groups: zinc-sufficient (Zn-Suf) or low-zinc (Low-Zn). Zn-Suf and Low-Zn groups were fed on zinc-sufficient diet (zinc 33.7mg/kg diet) and low-zinc diet (8.0 mg/kg) during pregnancy, respectively. After delivery, Low-Zn were switched to zinc-sufficient diet. Maternal body weight, duration of pregnancy, the number of birth, the fetal death rate, and brooding behavior were monitored. As a result, maternal bodyweight, duration of pregnancy and the fetal death rate were not significant different between Zn-Suf and Low-Zn. However, several cases of low number of birth, and abnormal behavior of neglecting cubs were observed with Low-Zn. We also tested effects of feeding zinc-deficient diet in pregnant rats on salt preference. One-day pregnant SD female rats were fed on zinc-sufficient diet and zinc-deficient diet (Zn-Def; 2.2 mg/kg diet) during pregnancy. We found that salt preference increased with Zn-Def comparing to Zn-Suf.