NUTRIENT INTAKE PATTERNS AFFECT RESPONSES TO COLD STRESS AS MEASURED BY AUTONOMIC NEUROSYSTERM, SALIVARY CORTISOL AND PSYCHOLOGICAL VARIABLES IN COLLEGE FEMALE STUDENTS. Aodo A., Ohara I. Aichi Gakusen University, Aichi, Japan.

In humans, less information concerning food intake and autonomic responses under stress conditions is available. Therefore, we examined which nutrients modulate autonomic responses to cold stress. Twelve healthy women aged 19 years were recruited from a campus population. One day's nutrient intake was recorded by weighing throughout the day and divided into 3 groups: 1) each nutrient high consumption group and 2) low. Cold stress load was made by soaking the waist in 5°C cold water for 30 seconds. Autonomic nerve activities of low frequency (LF) and high frequency (HF) were calculated from heart rate variability, Salivary cortisol levels was analyzed by HPLC. The psychology following cold stress was evaluated from the scale of pleasure and arousal by the Affect Grid method. Following cold stimulation, LF/HF (sympathetic activity) was increased whereas HF (parasympathetic nerve) was decreased significantly. Salivary cortisol concentration rose 30 min after stimulation. No conspicuous difference was observed in psychological observation. Low consumption of energy, except protein, led to increase in LF/HF. High intake of vitamin led to increase in LF/HF. Low intake of fat led to increase in LF/HF and high intake of iron led to increase in HF. Control levels were significantly increased in low intake of vitamins D and E. These results suggest that vitamin intake may protect against a variety of stress responses. Further studies are needed to evaluate portion sizes and tools to standardize food intake for global comparisons. Nutrition education should specifically address young adults' food behavior.

MAGNESIUM IN THE MATERNAL DIET IS IMPORTANT FOR EARLY BRAIN DEVELOPMENT. Buck, DR. State of Connecticut Department of Social Services, Hartford, CT 06106, USA.

In an earlier paper (J Nutr. 113: 2421, 1983), Bales and I presented data showing that the offspring of rats who were fed more magnesium (Mg) grew faster than those fed less. This growth effect was independent of the amount of food eaten. I now present data showing the effects of magnesium on the lactating dams, on their pups' brain weight, total brain DNA and brain RNA when they were 21 days old. The four diet groups were a low-Mg diet (containing 125 mg Mg/kg), a group fed 500 mg/kg (Low Mg group), an ad libitum group fed 500 mg/kg, and a high-Mg group fed 900 mg/kg. To test the effect of food intake, data from the Deprived groups (Low Mg and ad libitum) were combined and compared with data from the Higher Mg groups (Pair Fed and ad libitum).

Mean brain weight was less for the Deprived than the Well Fed groups, as expected (1.17 g vs. 1.29 g, P<0.01). It was also less for the Lower than the Higher Mg groups (1.27 g vs. 1.26 g, P<.001). Total brain RNA was less for the Deprived than the Well Fed groups (2.00 mg vs. 2.21 mg, P<.001), and for the Lower than the Higher Mg groups (2.03 mg vs. 2.19 mg, P<.001). RNA, on the other hand, was higher for the Lower Mg than the Higher Mg groups (20.1 mg/ml fresh tissue vs. 21.3 mg/ml, P<.005) indicating catch-up development. There were no sex differences.