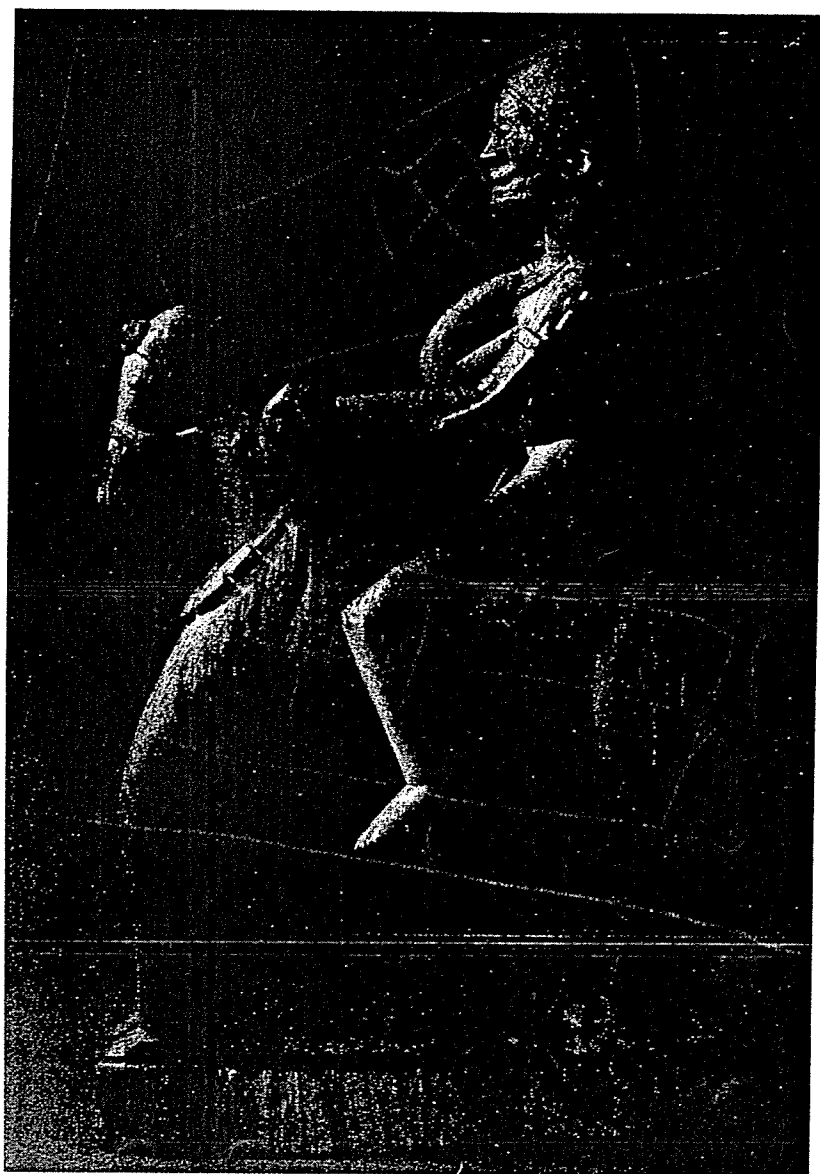




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EVALUATION OF HEALTHY EATING INDEX OF AMERICAN AND GERMAN COLLEGE STUDENTS

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The United States Department of Agriculture's Healthy Eating Index (HEI) is considered to be an excellent tool for assessing diet quality and overall impact of food choices. Demographic data, anthropometric measurements, and food records were obtained from students at Montclair State University (MSU) in the USA and Karlsruhe University (KU) in Germany. One hundred twenty one students at MSU and twenty nine students at KU completed their 3-day diet records and food frequency questionnaires. The amount of food consumed in grams was adjusted to number of servings for the KU students. The mean age \pm standard deviations were 22 ± 4.0 (MSU) and 22 ± 3.4 (KU) years. The mean BMI for the MSU students (23.3 ± 5) was significantly higher ($p < 0.01$) than the KU students (21.4 ± 2.6). A 2 sample t-test showed that mean HEI was significantly lower than the recommended HEI of 80 for both MSU 63.7 ± 11.1 and KU students 66.0 ± 26.6 . Women's HEI in both groups were scored higher than men and American women 68.7 ± 27.8 scored significantly higher ($p = 0.08$) than American men 59.4 ± 33.6 . The HEI and the 3-day diet records indicated that the consumption of plant-based foods, particularly vegetables, fruits, and grains was far below (especially in MSU group) the recommended amount for this group. Validation of the various methods of diet quality against biochemical, anthropometric, and clinical parameters of nutritional status is needed. 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.

Nutritional Guidelines Can Improve Headaches, Fatigue and Other 'Hypoglycemic' Symptoms in Adolescents: Three Case Reports. Edman JS, Halbert SC. Center for Integrative Medicine, Thomas Jefferson University and Hospital, Philadelphia, PA

Nutritional intake in adolescents is often inconsistent or poor due to the consumption of fast foods, as well as lifestyle factors such as missing meals, poorly designed vegetarian diets, and others. A potential consequence is 'reactive hypoglycemia,' characterized by headaches, fatigue, irritability, heart palpitations and other symptoms. The following are three cases of adolescents whose symptoms significantly improved when nutritional recommendations were followed.

Case 1 was a 16 year old male who presented with daily headaches and significant fatigue, especially in the late afternoon. History, physical, and routine chemistries were unremarkable. Dietary recommendations included eating 4-5 times/day, protein servings 3-4 times/day and decreasing intake of sugar, soda and fruit juice. Symptoms improved significantly within four weeks, such that headaches occurred only occasionally and energy level was normal.

Case 2 was a 15 year old male who presented with headaches and fatigue. His history included familial hyperlipidemia for which he received treatment from a local lipid clinic. Dietary guidelines significantly improved fatigue and headaches but were unable to control the lipid disorder.

Case 3 was a 19 year old female who presented with headaches, weakness, dizziness and fatigue, and was being treated for depression and attention deficit disorder using medication. The history was significant for several medication trials and hospitalizations. She was primarily following a vegetarian diet (occasional fish) but often missed meals. Increasing protein intake, regular meals and decreasing sugar intake led to significant improvement in headache, fatigue, and dizziness within 4-6 weeks.

These cases suggest that common symptoms in adolescents may be nutrition-related and can respond to appropriate recommendations. Physicians and nutritionists should be aware of these potential relationships and provide nutritional treatment. Future research should evaluate the prevalence of 'reactive hypoglycemia' in adolescents, and biochemical markers and other characteristics that may identify those affected.

NUTRITIONAL EVALUATION OF A RICE-HYDROLYSATE FORMULA IN INFANTS WITH COW'S MILK ALLERGY. Giovannini M, D'Auria P, Sala M, Scaglioni S, Zenga A, Pederiva C, Riva E. Department of Pediatrics, San Paolo Hospital, University of Milan, Milan, Italy

Extensive hydrolysates have been recommended for the treatment of cow's milk allergy (CMA) but few information is available about their nutritional value. Aim of the present study was to assess the nutritional role of a rice-based hydrolysed formula (RHF) compared with a soy-based formula (SF) in children with CMA. Sixteen children (9M, 7 F, aged 6-14 months) with CMA, confirmed at DBPCFC, were considered eligible for this trial. At the enrollment patients were randomized to SF (n=8) or RHF (n=8). Written informed consent was obtained from the infants' parents and the study design was approved by the departmental ethics committee. Anthropometric parameters were recorded at the enrollment and 1, 2, 4, 6 months afterwards. Body weight and recumbent length were obtained by means of standard anthropometric techniques and equipment. The z-scores of weight for age (WA), length for age (LA) and weight for length (WL) were calculated. Biochemical nutritional markers and plasma aminoacids were analyzed at the enrollment and 6 months afterwards. The Mann-Whitney test was used for statistical comparison; significance was set at 0.05. All infants completed the study protocol. No significant differences between groups were observed for z-score of WA ($p = 0.515$), LA (0.894), WL ($P = 0.65$) during the follow-up; no significant differences between groups were observed for any biochemical nutritional marker including plasma aminoacids levels. No adverse events and side-effects occurred during the follow-up in both groups. Even if larger clinical trials are needed, hydrolysed rice formula may be as efficient as soy-formulas on a nutritional standpoint and may be considered a safe and valuable choice in infants with CMA.

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

In humans, less information concerning food intake and autonomic responses under stress conditions is available. Therefore, we examined which nutrient influences 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 in the week and divided into 2 groups on each nutrient: high consumption group and that of low. Cold stress load was made by soaking the wrist 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 were 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 nerve) was accelerated and 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 vitamins led to increase in LF/HF. Low intake of iron led to increase in LF/HF and high intake of iron led to increase in HF. Cortisol levels were significantly increased in low intake of vitamins D and E. These results imply that not only quantitative but also qualitative proper food habits may increase the power of resistance to stress and that LF/HF and HF may serve as a predictor for the stress.

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), J. Bales and I presented data showing that the offspring of rat dams 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 four diets fed to 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 group fed diet containing 125 mg Mg/kg, a group fed 500 mg/kg pair fed to the 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 Pair Fed) were combined and compared with data from the Well Fed groups (*ad Libitum* and High Mg). To test the dietary magnesium effect, data from the Lower Mg groups (Low Mg and *ad Libitum*) were combined and compared with data from the Higher Mg fed groups (Pair Fed and High Mg).

Mean brain weight was less for the Deprived than the Well Fed groups, as expected (1.17 g vs. 1.29 g, $F_{1,28}=317$ $p < 0.001$); it was also less for the Lower than the Higher Mg groups (1.21 g vs. 1.26 g, $F_{1,28}=21.2$, $p < 0.001$). Total brain DNA was less for the Deprived than the Well Fed groups (2.00 mg vs. 2.21 mg, $F_{1,23}=42.000$, $p < 0.001$), and for the Lower than the Higher Mg groups (2.03 mg vs. 2.19 mg, $F_{1,23}=226$, $p < 0.001$). RNA, on the other hand, was higher for the Lower Mg than the Higher Mg groups (20.1 mg/g fresh tissue vs. 21.3 mg/g, $F_{1,28}=11.5$, $p = 0.005$) indicating catch-up development. There were no sex differences.

EFFECT OF AN ASTAXANTHIN CONTAINING PRODUCT ON CARPAL TUNNEL SYNDROME. Nir, Y., Spiller, G., Multz, C. Health Research and Studies Center, Los Altos, CA.

Carpal Tunnel Syndrome (CTS) is a debilitating disease often requiring surgery. Because not all patients respond to surgery and current non-surgical treatments provide limited benefits, investigations into alternative techniques are necessary. We investigated the effect of feeding 3 times a day an extract of *Haematococcus* algae grown in Hawaii, each dose supplying 4 mg of astaxanthin, 40 µg lutein, 65 IU vitamin A as beta-carotene combined with 50 IU vitamin E, on the symptoms of CTS in a double-blind, placebo-controlled, parallel design study. Twenty participants were randomized to receive either the extract (13 subjects) or a placebo (7 subjects) for eight weeks. Daytime pain rate and duration were measured at the beginning of the study and after 4 and 8 weeks of treatment with the use of questionnaires. Results showed a trend towards decreasing pain rate and duration in the subjects receiving the extract, but because of the small number of subjects the results did not reach significance ($P > 0.05$). The daytime pain rates (mean \pm SD) at 0, 4 and 8 weeks were, respectively, 1.69 ± 0.99 , 1.23 ± 0.70 , and 1.00 ± 0.88 for the treatment group, and 1.67 ± 0.47 , 1.83 ± 0.37 , and 1.50 ± 0.50 for the control group. Similarly, the duration of daytime pain was 2.15 ± 1.23 , 1.69 ± 1.13 , and 1.38 ± 1.44 hours for the treatment group, and 2.17 ± 1.07 , 2.67 ± 1.10 , and 2.17 ± 1.34 hours for the control group. The positive trend observed in this pilot study suggests that an astaxanthin-containing product may be effective in treating symptoms of CTS. Further investigation in a larger-scale study is needed.