

ULTRA-PROCESSED FOOD INTAKE, BUT NOT BODY COMPOSITION AND MUSCLE STRENGTH, IS ALTERED IN A 50-DAY ANTARCTIC EXPEDITION

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Abstract

Introduction: Cold exposure can impair muscle strength due to a decrease in central and peripheral body temperatures. Cold can also alter appetite and consequently body composition in extreme environments such as Antarctica. **Objective:** To investigate the quantity and quality of food consumption, body composition and muscle strength of expeditioners in Antarctica in a 50-day expedition (~7 weeks; 7w). **Methods:** For analysis of food consumption, 7 volunteers (5 men and 2 women) completed 2 to 4 food intake records (FIR) throughout the weeks. Body composition was evaluated by body mass and the percentage of fat was estimated by 7 skinfolds (triceps, chest, midaxillary, subscapular, abdominal, suprailiac and thigh). For analysis of maximum isometric strength, 3 trials of handgrip test were performed with a dynamometer and the highest value was considered. All tests and FIR were performed at week 3 of expedition (3w) and at the end of 7w. For statistical analysis, paired *t* test was used to compare the time-points (3w vs. 7w). All experiments and protocols were approved by *Universidade Federal de Minas Gerais (UFMG)* - The Ethics Committee on Research (CEP 4.294.245). **Results:** The mean daily energy consumption from 3w to 7w was 2,561 kcal, of which $23.8 \pm 11.6\%$ was natural or minimally processed foods, $29.4 \pm 15.1\%$ processed foods and $45.2 \pm 17.7\%$ ultra-processed foods. The percentage of total energy intake of processed and ultra-processed foods was greater - ~3-fold greater - than in natura and minimally processed foods. This finding is

the opposite that found in the Brazilian population, for which a consumption of in natura and minimally processed foods is ~2-fold greater than processed and ultra-processed foods. On the other hand, body composition and maximum isometric strength did not alter from 3w to 7w.

Conclusion: Despite increasing ultra-processed food intake over the time, upper limb muscle strength and body composition were unchanged.

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