

Introduction and aim

Information about the nutritional status and dietary practices and requirements of synchronized swimming (SS) athletes is very scarce (Lundy, 2011).

The body composition and somatic profile of current top young elite SS athletes need to be updated (Bante et al., 2007).

This study examines the body composition and nutritional status of young elite synchronized swimmers aiming to ascertain whether there are risks associated to their health and performance.

Materials and methods

15 swimmers of the junior Spanish national team ($15,8 \pm 1,0$ y; $54,9 \pm 4,3$ kg; $168,4 \pm 5,0$ cm; BMI $19,4 \pm 2,0$ kg/m²) completed anthropometric assessment (ISAK), seven-day food intake record, and haematology and blood biochemistry analysis during a pre-competition period.

Food intake was quantified using PCN-GRAMS 1.1 CESNID® software and compared with the European Food Safety Authority (EFSA) recommendations to assess nutritional status.

Energy requirements were estimated using the Harris-Benedict formula and Ainsworth's compendium of physical activities.

Results

Anthropometry (mean \pm SD): $\Sigma 6$ skinfolds $70,6 \pm 10,5$ mm; body fat mass $17,7 \pm 2,1\%$; skeletal muscle mass $43,1 \pm 2,2\%$; somatotype $2,8 \pm 0,5$ / $3,5 \pm 0,9$ / $3,7 \pm 1,1$ for endo-, meso- and ectomorph components, respectively.

Nutrition: energy intake 2184 ± 406 kcal/d; CHO consumed $4,6 \pm 1,1$ g/kg; protein consumed $2,1 \pm 0,4$ g/kg; energy intake from fat $32,8 \pm 5,3\%$.

Haematology and biochemistry: haematocrit $37, \pm 1,8\%$; haemoglobin $12,4 \pm 0,5$ g/dl; transferrin 261 ± 36 mg/dl; ferritin $24,7 \pm 16,4$ ng/ml.

Estimated energy requirements were 2871 ± 358 kcal/d ($12,02 \pm 1,5$ MJ/d). All the swimmers were not in intake/expenditure energy balance. A high percentage of swimmers failed to meet macro- (CHO: 85,7%; Protein: 64,3%; Fat: 78,6%) and/or micronutrient (Fe, Mg: 92,9%; Zn: 100,0%) recommendations for the general population of their age.

Discussion and conclusions

SS is characterized by high and complex physiological demands (Rodríguez-Zamora et al., 2012).

Young synchronized swimmers must be properly conditioned and properly nourished to perform optimally and to meet developmental requirements. A high proportion of the young elite swimmers studied were not in energy balance and/or failed to meet macro- and/or micronutrient recommendations, which may negatively impact performance and physiological development.

More research is needed to understand the unique nutrition needs of this population and to propose general guidelines or recommendations for this high-risk athletic population.



Bante S, Bogdanis GC, Chairopoulou C, Maridaki M (2007). J Sports Med & Phys Fitness 47, 291-299.
Lundy B (2011). Int J Sport Nutr Exerc Metab 21, 436-445.
Rodríguez-Zamora L, Iglesias X, Barrero A, Chaverri D, Erola P, Rodriguez, FA. (2012). PLoS One 7(11), e49098.

