



Nutrient Intake of Elite Canadian and American Athletes with a Spinal Cord Injury

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ABSTRACT:

The nutrient needs of athletes with SCI (spinal cord injury) are dependent on their physiological alterations, and adaptations to training load and intensity of practice. Limited research is available regarding the geographical differences between SCI elite athletes and possible nutrient deficiencies. The purpose of this study was to examine the diets of ($n=12$) Canadian (CAN) and ($n=27$) American (USA) elite SCI athletes from the *US Paralympic Canadian Sport Institute* utilizing a self-reported 24 hour diet recall. Nutrient inadequacy was estimated by the proportion of athletes with mean intakes below the estimated average requirement through the Research Solutions Food Processor Diet Analysis Software (ESHA). Mean energy intakes were $1,603 \pm 855$ kcal for women and 1906 ± 756 kcal for men respectfully. Reported micronutrient intakes were below EAR in $>60\%$ of (USA) athletes in Vitamin D, Folate, Calcium, Magnesium, Potassium and Zinc. Over 60% of (CAN) athletes reported intakes below EAR in Niacin, B6, B12, Vitamin C, Vitamin D, Folate, Calcium, Iron, Magnesium, Potassium and Zinc. In conclusion, nutrient intakes below the estimated average recommendation (EAR) were consistently found for both groups of elite SCI athletes and suggested similar nutrient insufficiencies. Further research is needed to examine nutrient intake using other methods of dietary assessment and to determine the factors that may lead to nutrient insufficiency among elite athletes with SCI.

INTRODUCTION:

Adequate nutrition for elite athletes is vital for optimal performance, sustained practice and overall capacity to perform at a high physical caliber. Limited research is available regarding the geographical differences between elite athletes with spinal cord injury (SCI) and possible nutrient deficiencies as well as information regarding adequate nutrient intake guidelines. Although there are established guidelines for elite athletes without SCI, these guidelines may be inconsistent with the needs of this specific group of elite athletes. Analyzing the current diets of these athletes is an important step in determining nutrient needs.

PURPOSE:

The purpose of this study was to analyze the diets of elite athletes with SCI from the *US Paralympic Canadian Sport Institute* utilizing a self-reported 24 hour diet recall to predict nutrient insufficiency status.

METHODS:

- The diets of ($n=12$) Canadian (CAN) and ($n=27$) American (USA) elite athletes with SCI were recorded using a self reported 24 hour diet recall
- Nutrient inadequacy was estimated by the proportion of athletes with mean intakes below the estimated average requirement (EAR) through the Research Solutions Food Processor Diet Analysis Software (ESHA).
- Each athlete recorded type, quantity, preparation method and time of each meal and snack to later be analyzed for macronutrient and micronutrient values.

RESULTS:

- Mean energy intakes were $1,603 \pm 855$ Kcal for females ($n=19$) and 1906 ± 756 Kcal for men ($n=20$)
- Micronutrient intakes were below EAR in $>60\%$ of athletes in: (USA)
 Vitamin D, Folate, Calcium, Magnesium, Potassium and Zinc (CAN)
 Niacin, B6, B12, Vitamin C, Vitamin D, Folate, Calcium, Iron, Magnesium, Potassium and Zinc

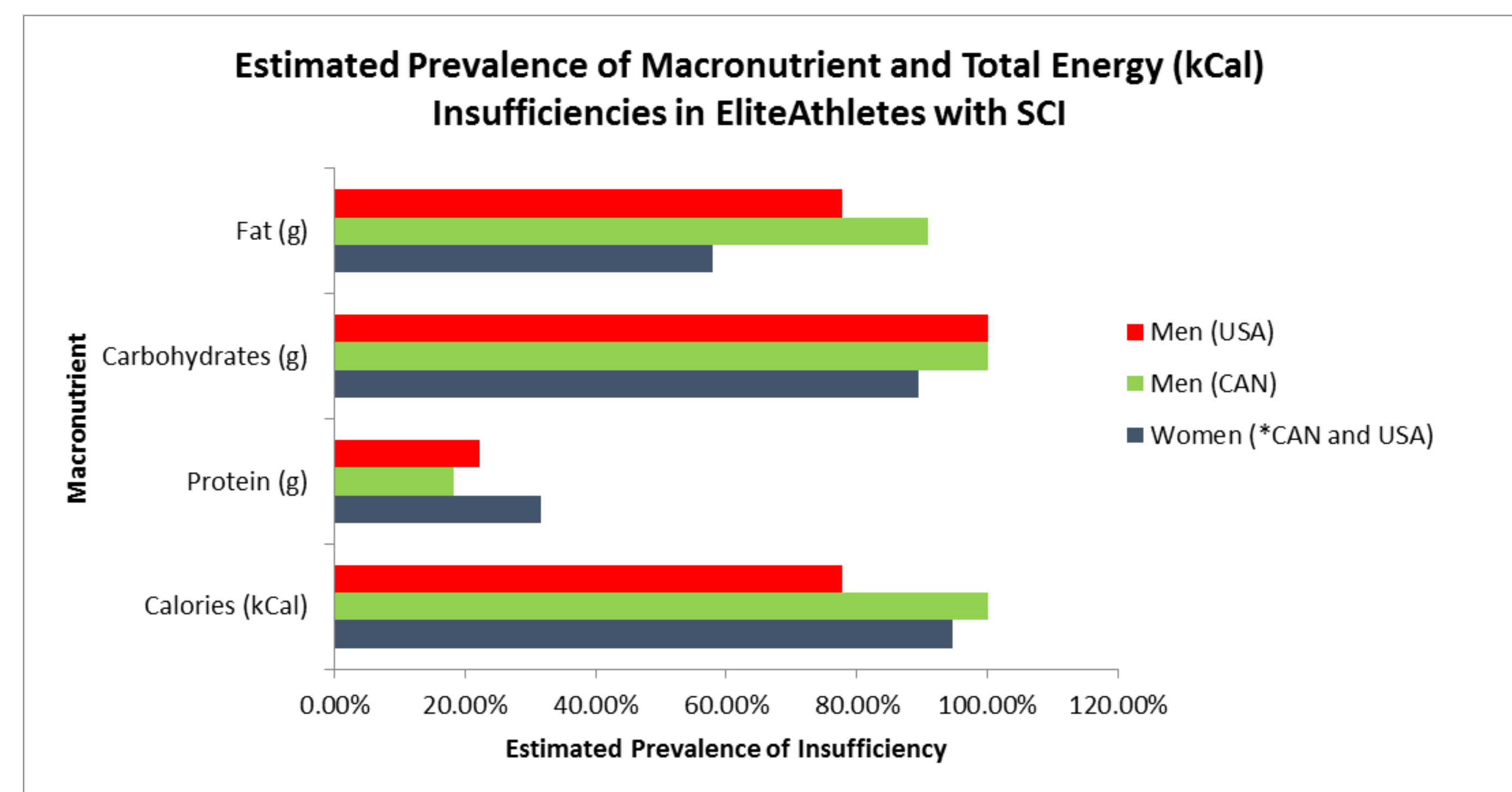


Figure 1. Estimated prevalence of macronutrient and total energy insufficiencies in elite athletes with SCI. Means represented for groups (USA) Males and (CAN) Males. *Females in groups (CAN) and (USA) were combined because of small sample size.

Estimated Prevalence of Micronutrient Insufficiencies in Elite Athletes with SCI

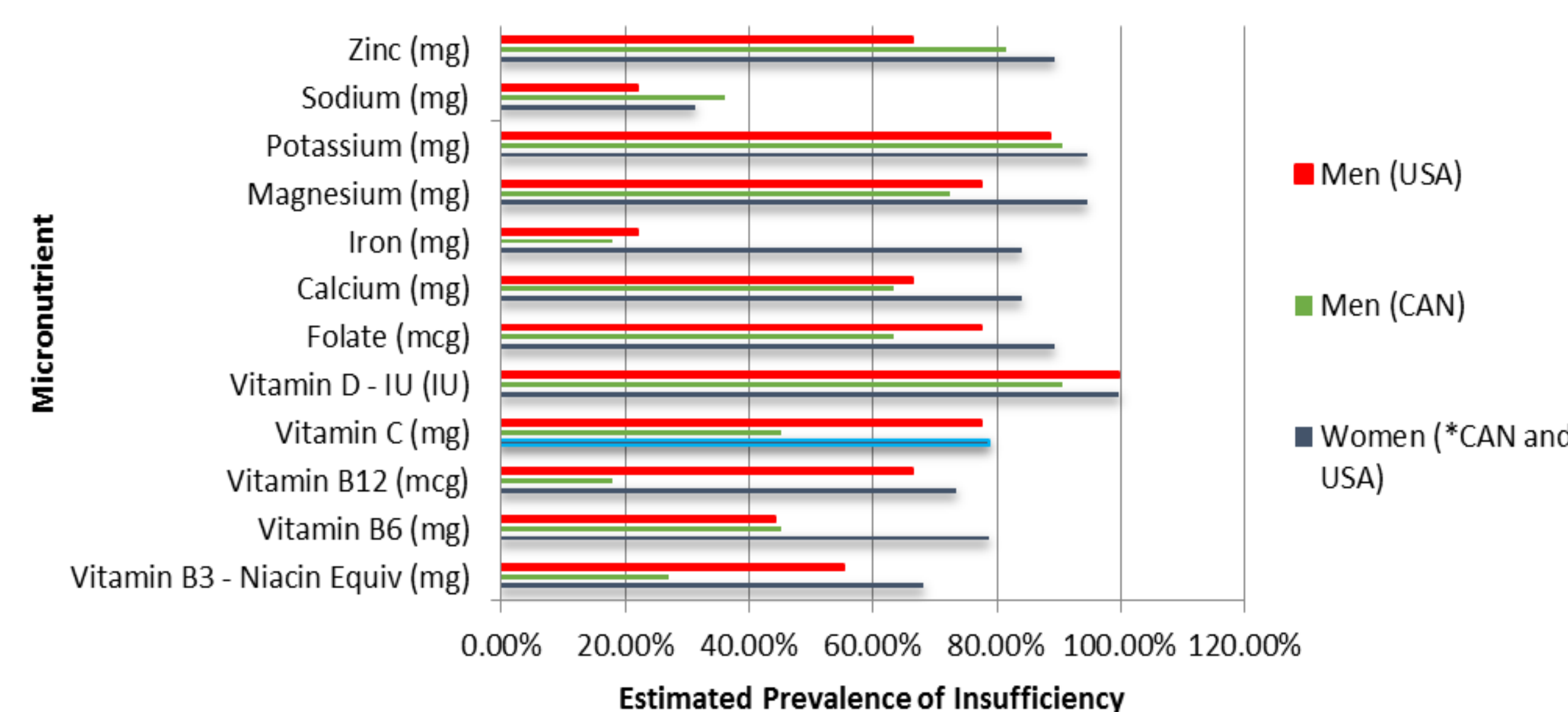


Figure 1.2 Estimated prevalence of micronutrient insufficiencies in elite athletes with SCI based on 24 hour recall. (USA) Males, (CAN) Males and (CAN)/(USA) *Females in groups (CAN) and (USA) were combined because of small sample size

Table 1. Mean nutrient intakes ($n=39$) of 24 hour diet recalls in SCI athletes, (USA) and (CAN)

NUTRIENT	M+SD
Micronutrients	
VITAMIN B6 (mg)	1.2±1.2
VITAMIN B12 (mcg)	3.0±3.8
VITAMIN C (mg)	75.0±96.7
VITAMIN D (IU)	92.0±159.2
FOLATE (mcg)	189.5±202.9
CALCIUM (mg)	783.4±576.3
IRON (mg)	13.9±8.1
MAGNESIUM (mg)	200.4±246.3
ZINC (mg)	6.3±8.2
Macronutrients	
PROTIEN (g)	84.3±44.8
CARBOHYDRATE (g)	211.5±93.9
FAT (g)	69.8±44.9

TAKE HOME MESSAGE:

- Micronutrient insufficiencies were found within both groups of elite SCI athletes, the highest reported insufficiencies were in group (CAN).
- This could suggest regional differences as related to diet and intake status
- Males and females in both groups also had variable intake insufficiencies, with women in both groups (CAN) and (USA) averaging the highest insufficiency status.
- Athlete performance could be affected based on insufficient intake of nutrients, but further investigation is needed to determine inadequate intake status with larger sample size and multiple trials.
- Nutrient needs also may vary according to training load, type of injury

REFERENCES:

Krempien, J. L., & Barr, S. I. (2011). Risk of Nutrient Inadequacies in Elite Canadian Athletes With Spinal Cord Injury. *International Journal Of Sport Nutrition & Exercise Metabolism*, 21(5), 417-425.