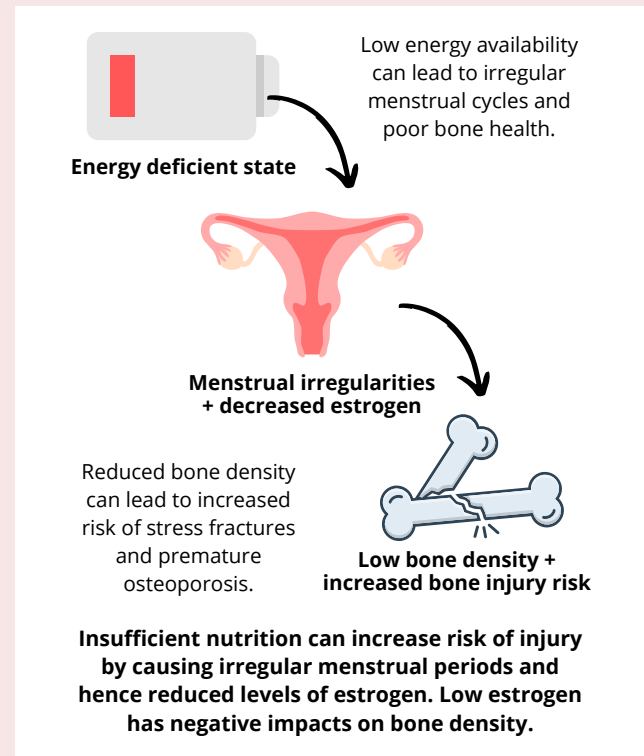


Nutrition for athletes varies according to the specific sport, exercise frequency and intensity. Appropriate fueling considerations ensure adequate energy for sport and recovery. Insufficient nutrition can increase the risk of injury and can negatively affect athletic performance. (1)

Para athletes have differences in mobility, bone health, body composition, metabolic and neurological function which impacts their energy requirements. Currently, there are no standardized nutritional intake guidelines for athletes with disabilities. (1) Fueling between para athletes differs significantly from person to person, which supports the need for individualized nutrition plans tailored to specific needs. (2)



## Specific Considerations for Para Athletes

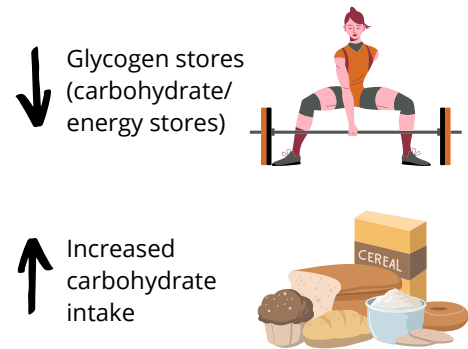
- Para athletes have lower total energy expenditure (TEE) compared to athletes without disabilities which results in less food consumption to maintain energy balance. However, negative energy consumption can lead to nutritional imbalances. (1)
- Despite adequate intake of macro and micronutrients, energy intake of female para athletes has been shown to be significantly lower compared to their male counterparts. (2)
- A neurogenic bladder or bowel and a longer GI transit time can impact nutritional composition and energy intake. (3)
- Athletes with amputations have been shown to have a higher energy cost during walking and a lower power output during cycling. This results in reduced daily energy expenditure. Regarding bone health, a lower ground reaction force reduces bone load and results in decreased bone mineral density. (3)

## Nutritional Recommendations for Para Athletes

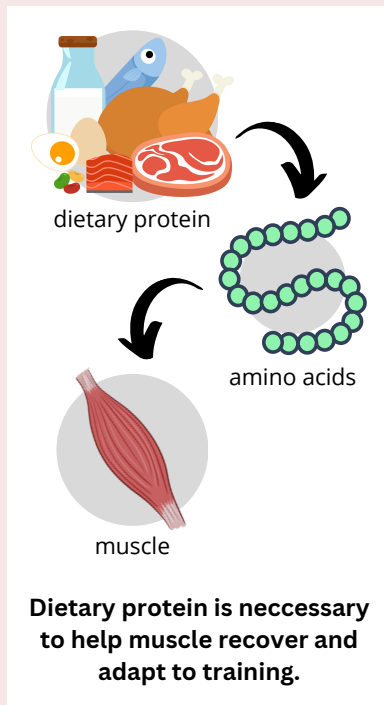
### Carbohydrates

- Athletes with wheelchairs use more upper body muscles for their sports and use almost the same amount of stored glycogen even though the storage of muscle glycogen is significantly lower. (1)
- Glycogen stores in athletes with spinal cord injury, cerebral palsy, or amputations might be less due to lower active muscle mass. Guidelines for these athletes are tailored based on their active muscle mass, energy requirements, and fat-free mass. (3)
- Depending on the disability and sport type, it may be appropriate to increase the athlete to a higher carbohydrate intake. (2)

Each para athlete will have unique needs that must be taken into consideration when developing a fueling plan.



Certain para athletes may have a reduced ability to store carbohydrates. This means some para athletes may need to eat more carbohydrates than what is recommended for non-para athletes.



### Protein

- Para athletes have been shown to have a lower protein intake due to lower muscle activity and energy expenditure. (1)
- It is reasonable to implement a post-exercise protein intake of 20-25 g to enhance recovery in athletes. (3)
- Planning 3-4 protein servings over a day might improve overall muscle protein synthesis and minimize breakdown. (3)
- Overall protein intake is recommended to be at least 1.2 g/kg/day in athletes with spinal cord injuries and between 1.2 up to 2.2 g/kg/day in athletes with other disabilities. (3)
- Take caution in protein intake with athletes with kidney disease. (3)

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## Nutritional Recommendations for Para Athletes (continued...)

### H2O and Fiber

- The level of intake and knowledge about water and fiber needs in para athletes is low. (1)
- Suggestion of small salted snacks (like pretzels) before exercise can help stimulate thirst and fluid retention. (3)
- All para-cyclists, regardless of spinal cord injury, cerebral palsy, visual impairment or amputees, should aim to prevent fluid loss to 2% of body weight. (3)



### Vitamins and Minerals

- Vitamin D is the most common deficiency in Paralympic athletes. Not only does this affect sport performance but it can increase the risk of osteoporosis due to increased bone resorption and decreased bone formation. Vitamin D and calcium supplementation is often recommended. (1)
- In wheelchair athletes, there has been a reported higher incidence of Vitamin D deficiency in the winter months and with indoor sports. Paralympic athletes are more likely to have insufficient exposure to sunlight due to increased sensitivity and thermoregulation issues in the paralyzed extremities. (2)
- Paralympic athletes are prone to increased excretion of Vitamin C in sweat and urine. (1)
- Wheelchair athletes and athletes with spinal cord injuries have been shown to suffer from a variety of micronutrient deficiencies including: calcium, magnesium, iron, phosphorus, selenium, niacin, riboflavin, thiamine, folate, and vitamins A, E, B6 and B12. (1) (2)
- Increased intake of fresh fruits and vegetables can help address the low intake of vitamins and minerals. (2)

# FUELING CONSIDERATIONS FOR PARA ATHLETES



## Citations

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