

Pre-race Fueling

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Background

Carbohydrate (CHO) is the primary fuel source for high intensity activities such as mountain biking, and consuming sufficient CHO daily, as well as prior to training and competition is necessary to sustain appropriate training and racing intensities. Guidelines pertaining to CHO intake in athletes is primarily based on research involving adult athletes (>18 yrs); however, existing evidence suggests that these guidelines are also appropriate for adolescent athletes (12-18yrs) (1).

Day-to-day Carbohydrate Intake

Athletes should consume sufficient CHO to meet the fuel costs of their training load on a day to day basis, as a result, daily CHO intake is based on training intensity and duration. Guidelines range from 3-5g/kg/day for light levels of daily activity (<1hr) to 8-12g/kg/day for extreme training (>4hrs/day) and should vary depending on daily training volume and goals (greater intake for longer sessions and less intake for shorter sessions) (1,2).

For practical purposes, a typical adolescent athlete participating in moderate to high intensity training, such as mountain bike riding 1-3hrs/day should target 5-8g/kg/day (5 on the lower range, 8 on the upper range). The appropriate CHO intake range in a 140lb athlete that is consistently riding 1-3hrs/day could be determined in this manner: Step 1. Convert 140lbs to kg by dividing by 2.2 ($140/2.2=64$ kg). Step 2. Multiply 64 by 5 and 8 ($64 \times 5=320$; $64 \times 8=512$). So, in this example the athlete should target 320 to 512g/day depending on typical ride duration. Athletes are encouraged to consume high quality sources of CHO (whole grains, fruits and vegetables) to meet daily needs and can monitor CHO intake by paying attention to g CHO/serving of food (3).

Pre-event fueling

In general, it is suggested that athletes consume CHO prior to training or racing at moderate to high intensities for >60min, or for high intensity competitions (mountain bike racing) from 45-60min. The amount and type of CHO consumed is dependent on the duration of the event and the time available before an event, with ranges from 1-4g/kg, 1-4hrs prior to the event (2). Additionally, as the athlete gets closer to the event the focus should be on progressively easier digestible options. For example, an athlete competing in a longer event (>4hrs) that starts at 4pm would be able to eat a fairly large, reasonably digestible meal (4g/kg) at 12pm. While an athlete competing for 1-1.5hrs starting at 8am would be ok to consume 1-1.5g/kg in an easily digestible form 1-1.5hrs prior to the event.

Intake options for CHO may vary by the time of day but should include easily digestible forms of CHO such as pasta, rice, oatmeal, pancakes, white bread, potatoes, etc.

farther out from the event start time (2-4hrs). As the athlete gets closer to the event, options may include bagels, white bread, sport specific bars and gels, and sports drinks (1-2hrs) ...of course other options are available, and creativity is encouraged. It is very important that the athlete practice various options leading up to an event to determine the timing of intake and foods for performance.

This may be a useful pre-race CHO intake example for a late morning race: Breakfast (~7am) 3-4 pancakes, ¼ cup syrup, 1 banana (~150g CHO); Mid-morning (~9 am) Clif bar, 20 oz sports drink (~65g CHO); ~60 min before race 20 oz sports drink and a Stroopwaffle (~40g CHO). Of course, this is just an example, but it provides an idea of how these concepts may be employed.

Once again, practicing pre-race CHO intake and timing ahead of the competition is encouraged. The athlete should focus on consuming foods that are appropriate, familiar, and enjoyable in addition to developing a practical schedule that allows for adequate digestion and absorption of nutrients prior to the event.

Considerations to help reduce gastrointestinal distress

Gastrointestinal distress is common among endurance athletes and can result from a variety of things such as high competition intensities and repetitive gastric jostling (4). Nutrition can also contribute to GI distress. Consuming high fat, protein, and fiber prior to exercise have all been associated with increased risk for GI distress, as has dehydration (4).

To help reduce the potential for GI distress prior to and during a race, care should be taken to reduce high fat, protein, and fiber intake in the hours leading up to a high intensity event. Items such as greasy meats and cheeses, as well as high fiber breads, fruits, and vegetables are just a few examples of foods that may increase the potential for GI distress. Instead, focus on easily digestible forms of CHO as mentioned above and provide adequate digestion time for the type and amount of CHO consumed. It is also beneficial to monitor hydration in the hours leading up to an event. This can be done simply by assessing urine color...it should be a light yellow or “straw” colored. If the urine is darker, the athlete is encouraged to drink more fluid with a goal of being hydrated prior to the event. Consumption of sports drinks containing CHO and sodium can be very beneficial in this manner to help with CHO intake, as well as hydration.

References

1. Desbrow et al. Sports Dietitians Australia Position Statement: Sports Nutrition for the Adolescent Athlete. *International Journal of Sport Nutrition and Exercise Metabolism*, 2014, 24; 570 -584. <http://dx.doi.org/10.1123/ijsnem.2014-0031>
2. Joint Position Statement on Nutrition and Athletic Performance. *Medicine and Science in Sports and Exercise*, 2017, 48; 543-568.
3. Desbrow B. Youth Athlete Development Nutrition. *Sports Medicine*, 2021, 51; S3-S12. <https://doi.org/10.1007/s40279-021-01534-6>
4. Prado de Oliveira et al. Gastrointestinal Complaints During Exercise: Prevalence, Etiology, and Nutritional Recommendations. *Sports Medicine*, 2014, 44; S79–S85.

