Fuelling with Carbohydrate

Before Exercise and Competition

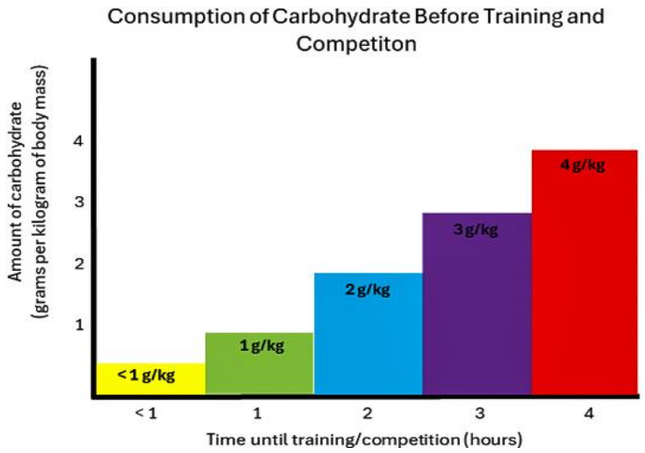
Goals of Pre-Exercise Nutrition

- Address hunger levels
- Meet the demands of exercise
- Keep glycogen levels topped up
- Suit individual preference or requirements

(1)

Guidelines and Considerations

- Time before exercise: more time → more food
- 1 - 4 grams of carbohydrate per kilogram of body mass → consume 1 - 4 hours before
- Meeting individual preferences → solid vs liquids or consuming regular snacks especially if prone to gastrointestinal difficulties



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Food Characteristics

- Low in fibre and fat → aids in digestibility and decreases bulk in gut
- High glycaemic index (GI) carbohydrates for faster absorption when closer to start time e.g., white bread, honey
- Low GI carbohydrates may provide more sustained energy → more suitable when exercise start time > 3 hours e.g., brown rice, oatmeal

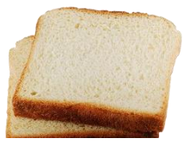
Example Foods

Medium Banana (~130g) 30g CHO

White Rice (Jasmine) (~125g serve) 40g CHO can have 2 serves with meal >3 hours

Sultanas 45g/30g CHO

Honey 20mL/20.6g CHO



White bread (1 slice ~33g) 15g CHO slide

Gluten free bread (1 slice ~38g) 17g CHO slide

Pre-Exercise Carbohydrate Calculator

https://asluggett.github.io/Sport-Nutrition/

https://asluggett.github.io/Sport-Nutrition/pre-training-carbohydrate-calculator.html

During Exercise and Competition

Goals of Intra-Exercise Nutrition

- Meet the demands of exercise
- Enhance performance
- Avoid "bonking" especially in longer duration events

Guidelines and Considerations

- Intake guidelines are independent of body mass and dependent on exercise intensity and duration
- Intake increases proportional to exercise intensity and duration
- Maximum glucose absorption is approximately 60 grams per hour
- The gastrointestinal tract is trainable → practice race day nutrition in training

Decision making table for intra-activity fuelling requirements

Duration	Activity Example	Carbohydrate Guidelines
< 45 minutes	Race or continuous training effort	Not required
45 – 75 minutes	Non-continuous training (e.g., intermittent interval training)	Mouth rinse (e.g., sports drink)
1.0 – 2.5 hours	Race, endurance training, and non-continuous training	30 – 60 grams per hour (glucose)
> 2.5 hours	Race long continuous training effort	90 grams per hour (2:1 glucose : fructose) e.g., 60g glucose and 30g fructose per hour

(1) (2)

Food Characteristics

- Easily absorbable carbohydrates → glucose and fructose
- Convenience and practicality → sports foods e.g. carbohydrate gels
- Sports drinks should have a 6 to 8% concentration of carbohydrate (6 – 8 g/100mL)

Examples Foods (Serving Size/Carbohydrate Content per Serve)

- Carbohydrates in this category are often sports foods
- Maltodextrin (glucose) is a common ingredient in sports foods

Sports Drink 600mL/35.6 g (5.9% carbohydrate solution)

Sports Gel 45g/29.8g Maltodextrin (Glucose) only

Sports Gel 51g/30g 2:1 Glucose:Fructose ratio

Intra-Exercise Carbohydrate Calculator

https://asluggett.github.io/Sport-Nutrition/

https://asluggett.github.io/Sport-Nutrition/intra_nutritional_calculator.html

1. Burke LM, Hawley JA, Wong SHS, Jeukendrup AE. Carbohydrates for training and competition. J Sports Sci. 2011;29(1):S17-S27.
2. Podlogar T, Wallis GA. New Horizons in Carbohydrate Research and Application for Endurance Athletes. Sports Medicine. 2022;52(1):5-23.

(3) https://afcd.foodstandards.gov.au/fooddetails.aspx?PFKID=F000262