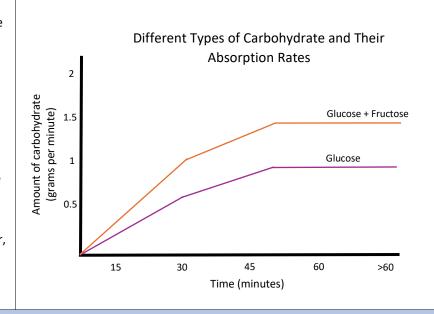
# **Fuelling with Carbohydrate – During Exercise and Competition**

#### **Goals of Intra-Exercise Nutrition**

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

### **Food Characteristics and Practical Application of Sports Gels**

- 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)
- A gel containing a total of 30g of carbohydrates per serve with a 2:1 glucose to fructose ratio contains 20g of glucose and 10g of fructose
- To consume 90g of carbohydrates per hour, you would need to consume a total of 3 gels within the hour → equates to 60g glucose and 30g fructose per hour



#### **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
- Select foods with transportable carbohydrates → glucose and fructose → to absorb more than 60 grams per hour
- The gastrointestinal tract is trainable  $\rightarrow$  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 or glucose-fructose mix) (1)
> 2.5 hours	Race long continuous training effort	90 grams per hour (2:1 glucose: fructose) i.e., 60g glucose and 30g fructose per hour

(1)(2)

## **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

- Use the following links or scan the QR code to access a calculator to determine the amount of carbohydrate to consume before exercise!
- Use the carbohydrate content of the example foods included here to correlate with your recommended amount

Calculator Home Page: https://asluggett.github.io/Sport-Nutrition/

During -Exercise Carbohydrate Calculator: https://asluggett.github.io/Sport-Nutrition/intra\_nutritional\_calculator.html



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