Carbohydrates in the diet

Carbohydrate provides an important, but relatively short-lived, supply of fuel for exercise that must be refilled each day from carbohydrate foods in the diet. The players’ everyday eating and drinking plan needs to provide enough carbohydrate to fuel their training program and to optimise the recovery of muscle glycogen stores between workouts. General targets can be provided for carbohydrate needs, based on the player’s size and the demands of the training program (see Table below). However, actual needs are specific to the individual and need to be fine-tuned with consideration of the total energy needs and specific training goals. It is important to get feedback from performance in training and match play to assess whether there is a problem with fuel availability.

### Targets for carbohydrate intake
- Immediate recovery after exercise (0-4 hours): about 1 g per kg of the player’s body weight per hour, consumed at frequent intervals
- Daily recovery from a moderate duration/low intensity training session: 5-7 g per kg BW per day
- Recovery from moderate-heavy endurance training (such as pre-season) or fuelling up for a match: 7-10 g per kg BW per day

### Strategies for choosing carbohydrate foods and drinks and for optimising glycogen recovery
When the period between training sessions is less than 8 hours (as in pre-season for elite players), carbohydrate intake, in the form of solids or liquids, should start as soon as practicable after the first session to maximise the effective recovery time. There may be some advantages in meeting carbohydrate targets through a series of snacks during the early recovery phase.

During longer recovery periods (24 hours), the pattern and timing of carbohydrate-rich meals and snacks does not appear to be critical, and can be organised according to what is practical and comfortable for each player.

There is no difference in glycogen synthesis when carbohydrate is consumed in liquid form or as solid foods. Given the amount of carbohydrate to be consumed, high carbohydrates foods will need to be spread out over the full 24 hours.

It is valuable to choose nutrient-rich carbohydrates and to add other foods to recovery meals and snacks to provide a good source of protein and other nutrients. These nutrients may assist in other recovery processes, and in the case of protein, may promote additional glycogen recovery when carbohydrate intake is below targets or when frequent snacking is not possible.

Carbohydrate-rich foods and drinks with a moderate to high glycaemic index (GI) provide a readily available source of carbohydrate for glycogen synthesis. These foods should form the major part of recovery meals.

Adequate energy intake is also important for optimal glycogen recovery; the restrained eating practices of some players, particularly females, make it difficult to meet carbohydrate intake targets and to optimise glycogen storage from this intake.

### Special comments
Guidelines for carbohydrate should not be provided in terms of percentage contributions to total dietary energy intake. Such recommendations are neither user-friendly nor strongly related to the muscle’s absolute needs for fuel.

### Examples of carbohydrate foods with moderate-high Glycaemic Index
- Most breakfast cereals
- Most forms of rice
- White and brown breads
- Sports drinks and soft drinks
- Sugar, jam and honey
- Potatoes
- Tropical fruits and juices

### Examples of nutrient-rich carbohydrate foods and meal combinations
- Breakfast cereal with milk
- Flavoured yoghurt
- Fruit smoothie or liquid meal supplement
- Sandwich with meat and salad filling
- Stir-fry with rice or noodles