

FLUID AND CARBOHYDRATE INTAKE DURING TEAM GAMES

The effects of nutritional strategies on performance in team games are uncertain, because changes in performance are hard to measure accurately in these sports. A small number of researchers have used lab tests, simulated games, or real games to measure the effect of hydration status and carbohydrate feeding on simulated game performance. The lack of consistency in the outcomes of these studies may be due to lack of precision in the measurement of performance, differences between athletes or sports in the effects of the nutritional intervention, or differences in environmental conditions between studies. Until there are better research tools, those who work with team sport athletes should continue to give nutritional advice based on research with endurance athletes. However, the fluid and energy requirements in a team game may differ considerably from those of an endurance event, so the advice should be tempered by common sense and experience.

Performance in team sports is determined by a complex mixture of physical fitness and mental skills. Players may have to run quickly to the ball or scene of play, perform manoeuvres involving strength, and execute skills involving cognitive function and fine motor control. Nutritional strategies could impact these physical and mental components of performance.

Exercise-science and sports-nutrition organisations have produced position stands or recommendations about the intake of fluid and carbohydrate during exercise. Typically, these guidelines target the requirements of sports involving prolonged continuous exercise, such as running or cycling, and are based on research of such exercise. How well the guidelines meet the needs of team-sport athletes is not clear, because the fluid and carbohydrate needs of team players differ from those of endurance athletes in several ways. Table 1 identifies some of the unique characteristics of team sports with regard to fluid balance.

Table 1: Factors affecting fluid balance in team sports.

Fluid Loss

- Workload involves intermittent high-intensity exercise interspersed with low level activity and rest.
- Playing characteristics and workload in a sport vary between players, positions and playing styles.
- Each match in a sport is a unique situation. There is no standard workload even for the same player.
- Sports are often played in an inside environment where conditions of heat, humidity, and airflow differ substantially from field conditions.
- Athletes may wear team uniforms and gear for protection, sponsorship, or tradition, rather than for consideration of heat transfer.
- Sports originating in cool climates often have rules and traditions that may not be suited to hot environments.
- Matches played close together in tournaments may lead to chronic dehydration.

Fluid Gain

- There is a tradition of ignoring fluid needs to “toughen” players in some sports.
- Opportunities to consume fluid are intermittent (formal breaks between sets or periods of match, informal breaks such as substitutions, time-outs, and game stoppages).
- Some sports impose rules to prevent athletes drinking during a play period.

A small number of studies have used these different designs to measure the effects of hydration status and carbohydrate feeding during a match. Not surprisingly, some studies provide evidence that carbohydrate and fluid intake enhances performance, whereas others claim no effect. These differences in outcome may reflect nothing more than lack of precision in the estimates of change in performance, but it is also possible that these strategies really do have different effects in different situations. For example, hydration and refuelling may be of more benefit in matches that involve a longer duration of play, or for players who are involved in most of the game activity. Similarly, the effects of dehydration and carbohydrate depletion are likely to be more pronounced when athletes play matches in hot conditions.

The challenge for sports scientists is to develop better research tools to monitor the success of nutritional strategies. Meanwhile, those of us who work in team sports must continue to guide our athletes with common sense recommendations. Here is a summary of the recommendations in our review, based on intuition and personal experience rather than objective evidence of performance benefits.

- In hot environments, be aware of factors that can affect heat accumulation during training or competition – time of day, length of play, conditions in indoor venues and suitability of uniforms or protection gear.
- Players should track sweat losses in different environments by weighing themselves regularly before and after training sessions. Use the data to identify individuals at risk of dehydration and to implement a team fluid-intake plan.
- Players must begin each match properly hydrated. Fluid losses from previous matches or training need to be restored. It is also useful to drink immediately before a game. Players can learn to tolerate up to 5ml per kg during the warm-up.
- Opportunities to consume fluid during the game should be optimised. Ideally, players should consume fluid every 10-15 minutes. If rules of the game prevent this practice, players may be able to find ways that work within the regulations.
- Players drink more pleasant-tasting sports drinks than plain water. Sports drinks have the extra advantage of providing energy in situations where liver and muscle glycogen stores are likely to be depleted.
- Post-match rehydration is an important part of recovery. Use drinks containing substantial amounts of carbohydrate and salts. Avoid excessive intake of alcohol.
- Players should practice the strategies in training so they can implement them successfully in competition.