

FACT SHEET RECOVERY

NUTRITION RECOVERY

'Recovery' is defined as a return to normal condition or state of health, mind or strength. For athletes, recovery is usually a multifaceted approach aimed at returning the body to pre-competition or training state. Hydrotherapy, massage, the use of compression garments, rest, sleep and nutrition may all play a role in athlete's recovery strategies. Paying particular attention to nutrition recovery immediately after a training session or event has been shown to positively effect subsequent exercise performance. This can be particularly beneficial for those athletes competing in two or more sessions in one day or, on consecutive days.

THE GOALS OF POST EXERCISE NUTRITION RECOVERY

1. Replenish fuel (glycogen) stores used during the training session or competition;
2. Deliver protein to assist with muscle repair and synthesis; and
3. Restore fluid and electrolytes lost in sweat.

A periodised nutrition recovery plan targeting acute nutrition intake can positively influence training adaptations. Providing the right nutrients at the right time can facilitate gains from the training program, assist the athlete to get stronger, allow them to train at a high intensity and have a protective effect on the immune system.

Recovery strategies should be individualised based on workload, the fuel used during the session, body size, body composition goals and the period of time before the next training session or event. It is important to factor in tolerance and preference of foods and fluids immediately post exercise to promote adequate and timely consumption.

CAN WHAT YOU CONSUME DURING YOUR SESSION AFFECT YOUR RECOVERY?

The fuel and nutrient delivery during a session can influence the emphasis on recovery post session. For example, after exhaustive endurance sessions, muscle glycogen replenishment is the priority during the recovery period [See fact sheet on Eating And Drinking During Sport for more information].

REFUELLING – THE REPLENISHMENT OF GLYCOGEN STORES

It is well established that carbohydrate ingestion plays a critical role in muscle glycogen synthesis post exercise. Failing to replenish glycogen stores can contribute to fatigue and compromise an athlete's ability to train at a high intensity in subsequent sessions.

The general recommendation for carbohydrate intake post exercise is to consume 1.2g/kg BW/hr for the first four hours (e.g. 85g carbohydrate for a 70kg athlete), and then resume normal carbohydrate intake, based on an individual's identified carbohydrate needs for that day. Often it is not practical to consume such large amounts of carbohydrate immediately post exercise, particularly if the athlete experiences difficulty tolerating food or drink immediately post exercise, or finishes their session late in the evening. The good news is that research has shown that the co-ingestion of protein with a smaller amount of carbohydrate (0.8g/kg/hr) can have similar results. Consuming protein (0.2 – 0.4g/kg/hr) with carbohydrate stimulates endogenous insulin release and results in similar glycogen replenishment rates as the carbohydrate ingestion of 1.2g/kg/hr (1).

So what does this look like? Outlined below are the immediate food and fluid choices for a 70kg athlete to replenish glycogen stores:

- One serve whey-derived protein shake + 300ml low fat milk and 600ml sports drink
 - 2 tubs of yoghurt and 2 cups of fruit salad
 - A salad roll with 60g lean sandwich meat and a banana
- *These options each provide at least 14-28g protein and 56g carbohydrate

Delivering carbohydrate immediately post exercise may also have a positive effect on the immune system. Exercising in a carbohydrate-depleted state results in larger increases in circulating stress hormones. It has been thought that consuming carbohydrate during and immediately after exercise reduces this rise in stress hormones and may reduce the degree of exercise-induced immunosuppression.

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PROTEIN FOR MUSCLE REPAIR

Whether completing resistance training or a conditioning session, the delivery of high quality protein can provide the building blocks to repair muscle and promote muscle protein synthesis.

Consuming essential amino acids, in particular leucine, in the immediate recovery period is essential for promotion of muscle protein synthesis, critical for muscle recovery and adaptation. Consuming 20-30g of protein (or an equivalent of 9g of essential amino acids) has been reported to maximise muscle protein synthesis in the first hours of post exercise recovery. [1]

These protein requirements may be met with a well-timed meal or snack post exercise. However, it may not always be possible to eat sufficient amounts of both carbohydrate and protein immediately post exercise. The use of a rapidly digested whey-derived protein supplement may be a practical option when experiencing a suppressed appetite, competing with other post session commitments including medical screens, media commitments and other recovery practices post event.

Intake of small serves of high quality protein as part of meals and snacks outside of the immediate recovery period may also be a useful recovery strategy, and will assist with meeting other nutrition goals. For more information on the types and timing of protein, please refer to our fact sheet on Protein and Amino Acids.

REPLACING FLUIDS LOST IN SWEAT - REHYDRATION

It is not uncommon to finish a training session or event with a fluid deficit. It is common practice for athletes to monitor weight changes during sessions to determine individual fluid losses. When designing a rehydration protocol, consideration needs to be given to the next time the athlete has to train or compete. The general recommendations for fluid replacement are to replace 120-150% fluid deficit over the next 4-6 hours. These guidelines should be translated into a practical and individualised fluid plan to ensure that fluids are replaced effectively before the next training session. It is imperative that athletes are not fluid loading unnecessarily or at risk of disrupted sleep due to ingesting large amounts of fluid before bed to meet fluid targets (as sleep interrupted by multiple pee stops is not conducive to recovery!).

The inclusion of sodium within post exercise recovery fluids may assist in replacing electrolytes lost in sweat. Consuming electrolyte-containing fluids may also assist in effectively replacing fluids by assisting the retention of fluids ingested. The amount of sodium to rehydrate effectively has been shown to be 50-80mmol. This can be achieved by consuming fluids with this concentration of sodium or by adding extra electrolytes to commercially available sports drinks. Alternatively foods that contain sodium can be consumed with recovery fluids to ensure adequate electrolyte intake. For more information on fluid composition and hydration, please refer to our fact sheet on Sports Drinks.

An athlete's post exercise fluid plan should be devised to meet individual requirements and ideally provide the athlete with other nutrients to meet additional recovery goals. In recent scientific literature, cow's milk (and soy, though to a slightly lesser degree) has been shown to be an effective rehydrating post exercise beverage. Milk has a similar electrolyte composition to sports drinks with the added benefit of carbohydrate and protein to assist with meeting other recovery goals. For further information, please refer to our fact sheet on Dairy and Sports Performance.

TAKE HOME MESSAGE

Post exercise nutrition and hydration forms a crucial part of an athlete's recovery and has been shown to positively affect subsequent exercise performance. Recovery plans should be periodised and tailored to meet the individual goals of the athlete. The importance of carbohydrate for glycogen replenishment is well researched, with intake prioritised when the subsequent exercise session is within a short space of time. In addition to muscle protein synthesis, protein may also assist with glycogen replenishment goals when co-ingested with carbohydrates. Fluid replacement guidelines should be practical and individualised to ensure that fluids are replaced effectively before the next training session. To tailor a recovery plan to suit your sport and individual requirements, click here to find an Accredited Sports Dietitian near you.

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