

Timing of protein Intake is Critical

Until recently ingesting a protein and carbohydrate beverage or snack before training was not in vogue. Also it has been established that pre-exercise meals decrease the body's testosterone levels after training, a situation that at first may not seem desirable. As always coaches are seeking to enhance the anabolic environment through natural means and if a meal blunts the circulating testosterone level then this may not be sensible. This was an area that was not well researched or understood until recently. However, there is now sound evidence to suggest that ingesting protein before training and exercise may help promote better recovery after training. Volek (52) suggests that the lower testosterone level found following training after ingesting a pre-exercise protein meal could be as a result of the greater uptake and use of circulating testosterone. In other words the available protein and testosterone get consumed by the fatigued muscle when protein is taken before and after training. Other authors suggest that pre-exercise protein may increase the capacity of the trained muscle to recover and repair as a result of the greater insulin response of ingesting protein (51,54). Mero and colleagues (32) have studied this extensively and suggest that ingesting protein before training may reduce the increase in platelet count which is a normal occurrence during strength training. The authors conclude that a reduced platelet count may be good for the health of blood vessels. Thus taking protein before training may have beneficial health effects. In addition, researchers have shown that protein uptake in the muscle is about two and a half times greater when a protein-carbohydrate snack is taken before exercise compared to immediately after exercise (55). So the best time to take a protein-carbohydrate snack to ensure a speedy recovery may be shortly before training!

Recent evidence convincingly shows that consuming protein in addition to carbohydrates immediately after strength training results in greater glycogen restoration and muscle synthesis (ie muscle building) compared to consuming carbohydrates only (4,24,54).

When trained Rugby players ingested a protein-carbohydrate drink after intense weight training their total work capacity improved up to 16% greater than when they only consumed carbohydrates in a subsequent bout of training. The authors speculated that the greater work capacity for the protein-carbohydrate trial may be as a result of the greater glycogen storing capacity of the muscle when protein is added to the post-training beverage (10).

Further there is growing evidence to suggest that when protein is combined with carbohydrates that not only is there a performance improvement in a subsequent bout of exercise but that muscle damage is also less (52). The exact amount that a

player should ingest before and immediately after training is not clear and it seems that it would certainly depend on the player's body weight. For team players 0.4 grammes of protein per kilo of body weight and 1.2 grammes of carbohydrates per kilo of body weight is recommended. Amounts in the region of 20-40 grammes of protein would therefore seem to be reasonable for the lightest to the heaviest playing Gaelic games. For example a player weighing 70 kg would strive to ingest 28 grammes of protein in combination with carbohydrates of 84 grammes. The 83 kg player (the average weight of an intercounty Gaelic player) would strive to ingest 34 grammes of protein and 102 grammes of carbohydrates after playing or training. Any protein ingested before and immediately after training should be calculated into the daily requirement of the player. An example of an 83 kg player's protein intake is outlined in section 22, 'A Typical Meal Plan for one day'.

In summary then, a combination of protein and carbohydrate consumed immediately following training or playing will aid recovery of muscle fuel and start the repair process within the muscles. Also there is good evidence to recommend that a player consume a protein and carbohydrate snack shortly before training. If there is a subsequent exercise routine then it is likely that the player will perform better if he has consumed a mix of carbohydrates and protein as opposed to carbohydrates alone.

Protein Rich Foods

While sports drinks are a convenient way of getting both carbohydrate and protein into the fatigued muscles it is important to ensure that your mainstay protein intake comes from solid foods. Table 3 identifies foods high in protein:

Table 3: A selection of high protein foods.

Breakfast	Lunch & Dinner	Snacks
<ul style="list-style-type: none"> ▪ Eggs ▪ Cold meats ▪ Cereals that include nuts ▪ Bacon ▪ Dairy including Milk, Cheese & Yoghurt 	<ul style="list-style-type: none"> ▪ Fish ▪ Beef ▪ Poultry ▪ Curds ▪ Dairy including Milk, Cheese & Yoghurt ▪ Cold meats 	<ul style="list-style-type: none"> ▪ Protein&Carbohydrate Recovery drinks ▪ Protein bars ▪ Nuts and Seeds

Some foods are richer in protein than others. Some protein rich foods however, also contain high levels of 'hidden' fat stores. For example, a normal portion or cut of roast lamb will contain 134 calories of which 40% of the calories are

saturated fat. The remaining 60% of the calories are from protein. This is why you are recommended to choose white meats (chicken, turkey) and fish instead of red meats. White meats such as turkey and chicken are low in fat. For example a slice of roasted chicken contains 135 calories (the same calorie level as the cut of roast lamb). However, only 20% of the calories come from fat with 80% from protein. The best source of high quality protein and beneficial fats are contained in fish. They are an excellent alternative to red meats. For example, one Rainbow trout contains approximately 330 calories. 252 of these calories are from protein with the remaining 78 calories from mainly unsaturated fats including healthy Omega-3 fats. One cautionary note however, all players should avoid fast food products such as battered fish, chicken nuggets etc. These are saturated with fat and tend to be processed to a high degree.

Key point 5

1. Protein is an essential nutrient
2. Players in training require between 1.2 grammes and 1.7 grammes of protein each day
3. You should eat protein at each meal - this should be the major source of your protein requirements.
4. The timing of protein during the day is critical
5. Protein ingested before training in conjunction with carbohydrates may help promote a favourable repair environment following training
6. Protein and carbohydrate ingested immediately after training speed up muscle repair and growth