**Sports And Performance Nutrition**

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**Week-04**

**Lecture-18: Anabolic window period for nutrient intake**

Hi everyone, in the recent chapters I had discussed about train low strategies which was low carbohydrate intake or avoiding eating carbohydrates. Then we also touched upon high fat diets and exercise performance. In this lecture let us understand what is anabolic window period. Food consumed immediately after exercise can have an impact on recovery. Is there a prime time to maximize the absorption of this nutrient for optimal gains? Let us go further into this learning. So what is anabolic window period? Anabolic window period is the optimal time post exercise in which the maximum protein absorption can occur.

So it is suggested that is best to time protein intake within about 30 minutes to 60 minutes after training. You must be well versed with these three pillars which involves recovery protocol. So taking care of the time, the type and the amount of nutrient within this prime anabolic window period can support recovery for an athlete. So, the focus of this lecture is around protein.

Of the three macronutrients, though protein is an energy yielder, its primary function is to support growth and maintain muscles. Muscle tissue is dynamic and is constantly undergoing a catabolism which is breakdown and anabolism which is synthesis or making of new muscle tissue. For an athlete other than honing the sports specific skills, aligning strength and conditioning and strength training is pivotal to muscle mass and muscle maintenance. So along with weight bearing exercise or strength training, ensuring high amounts of protein intake is very important for athletes. This way the athlete can ensure that he is always having a positive protein balance which can ensure he is able to repair and recover his muscle tissue.

Weight bearing exercise or sometimes even the sports specific training can lead to micro tears of the muscle tissue and that can be repaired only with adequate supply of high quality proteins. So the muscle protein synthesis or MPS is amplified only when there is a stimulus to the muscle with strength training coupled with intake of high quality protein. If an athlete does not take care to consume high quality or adequate amounts of protein, this can delay the recovery process. Now in my practice I do see athletes who not necessarily always plan their meals in such a way that they consume a meal immediately as they finish their training session. So that brings us to the question what about the prime anabolic window period within the first hour of training.

To take you back to this slide, I do not know how many of you may recognize this. In the protein chapter in the fundamentals of macronutrients, I had already discussed of what can be the ideal time to consume protein. So to revisit this, athletes or sports person can plan their protein on rising, before workout, during workout, after workout and also bedtime. Also the muscle remodelling process is of course complicated and requires about 25-30 grams of

protein in every meal. We know some amino acids within the body can be changed from one to another and hence some amino acids can be made within ourselves.

If you recollect, I also emphatically talked about one amino acid which is very crucial for muscle protein synthesis which is leucine and we will discuss that in just a bit. Also to emphasize the intake of adequate or high amount of carbohydrates. In the prime anabolic window along with protein rich food, carbohydrates may not have a direct impact on muscle mass but it is important to note that when you consume good amount of carbohydrate immediately after training along with proteins, they release the hormone insulin. Laminar oxygen influences the prevention of the breakdown of muscle tissue. So that way further damage to the muscle can be prevented by combining adequate amounts of protein along with carbohydrates.

So the best practice of course is to consume high quality proteins within 30 minutes or 1 hour after exercise. However it is equally important to distribute the same amount in 3 to 4 meals through the entire 24 hour cycle to maximize this muscle protein rebuilding. I know of some athletes who can push themselves to eat even 2 chicken breasts because they believe it can be beneficial for them. So you may ask me what happens if my protein intake can be more than 25 or 30 grams in 1 meal. So the nuance that the body cannot digest or absorb more than 30 grams of protein is not true.

To rephrase, yes there is a certain amount of protein that the body can use towards repair and rebuilding of the muscle tissue. But even if you double the amount, sorry to burst your bubble but the body uses extra protein and oxidizes or burns it as just an energy source for day to day activities. So ensuring leucine is high in meals post training can be a deciding factor for MPS. So this is an essential amino acid meaning that the body cannot make this thus we need to consume it in our daily diet from high quality proteins. So this is available of course through foods that come from animal source be it chicken, eggs or dairy.

So leucine has a direct impact on muscle protein synthesis and this is known as the leucine trigger where you want to ensure about 2.5 to 3 grams of leucine at least in a serving. So there are several high quality proteins that one can consume and most of these are from the animal source. Do keep in mind dairy is the best option which offers leucine and of course a fast digesting dairy source as a whey protein supplement also is very leucine rich and hence becomes superior for muscle building. Some scoop of a whey isolate can comfortably give you 2.

5 grams of leucine and that can help you meet the target very conveniently. So hence dairy or milk based options including chocolate milk can be an excellent recovery drink. I haven't forgotten the vegetarians choosing high quality protein sources tofu, tempeh or any soya based products such as soya chunks, soya granules in about larger portions of 50 to 40 grams of soya chunks can help you meet a decent amount of protein in one meal. So do keep in mind that though the prime anabolic window period is suggested to be between 30 minutes to 1 hour, the latest research guidelines do conclude that it is equally important to consume about 25-30 grams of protein in at least 3 to 4 meals and that may not be necessarily in just 24 hour which is one day that the muscle protein synthesis can stretch beyond that up to 48 hours or even 2 days and of course do ensure you consume 3 times more carbohydrates particularly if you are looking at increasing muscle mass. In the anabolic window period when the proteins are being

siphoned off into muscle building carbohydrates replenish muscle glycogen and prevent breakdown of muscle tissue.

When can a protein supplement be beneficial to an athlete and we dealt with this topic in detail in protein supplements. An athlete has a hard training and many times cannot always carry a full meal that can be consumed immediately after exercise. Sometimes athletes can travel beyond 1 hour to reach the academy and sometimes they get back only after the entire day session around evening or night. In that situation a protein supplement can be very useful to meet the high training load and ensure recovery for athletes. The amount of protein needs to be tailored to every athlete sport and situation.

On an average an athlete can plan anywhere between 1 to 2 grams of protein per kg body weight and also if you recollect if you are making weight or aiming for weight loss particularly in low carbohydrate diets the protein amounts can go up. In the process of low carb consumption ensuring higher protein can help maintain the muscle mass and also offer some additional calories for the day to day energy expenditure. Speaking of how it is also very important to plan for protein through the day we discussed of casein which is a protein supplement which is nothing but the paneer or the protein that is got after curdling of the milk from which rasgulla is made. The casein protein can maintain high amounts of protein or amino acids through the night when the muscle protein is being remade and this bedtime protein consumption can only increase muscle mass when coupled with strength training and does not lead to increase in fat percentage. Here are a few examples of food that athletes can plan to consume immediately after their training boiled eggs with either 3 slices of toast or tapathis or even a large bowl of approximately 300 grams of rice.

Now you may ask why not omelets? Any extra added oil can slow down the digestion process and if you recollect it is best to keep the fat and high fiber away from training. So incorporate them in meals which are a few hours post training. Grilled chicken which is marinated either in vinegar acids or curd and with a lot of herbs can prevent carcinogenic compounds. So you can either pan fry or grill it and that can be a good recovery meal. For vegetarians as I already called out tofu, tempeh, edamame and soya based extruded products such as soya granules or chunks can be a good high quality protein giving adequate amounts.

If you needed to consume dals or pulses like chole you will perhaps have to eat 300 or 400 grams which is 4 katoris of chole to get about 25 odd grams of protein and that can be very cumbersome for a athlete. And of course a protein supplement becomes quite convenient and easy to get a large amount of protein with a very small scoop. So to summarize consume high quality protein within the first 30 minutes to 60 minutes of window period after an intense exercise session. But most importantly plan to consume about 25-30 grams of protein also beyond that 1 hour in the remaining 3-4 meals across 1-2 days. This will ensure the maximal or optimal muscle protein synthesis.

Thank you for listening. Hi, I am Pragati Singh. I am a professional cricketer. I have been playing cricket as a profession for 5 years and my proficiency is I am a batting all rounder. Cricket as a sport is very challenging and demanding.

So particularly on a match day during a one day game you have to be on the ground for more than 8 hours and as an all rounder I have to bat and go less than. And carb loading 1 or 2 days before the match has really helped me to give that extra energy and to put in extra efforts in

the ground without getting fatigued. When you do an activity for more hours whether it's batting, bowling or fielding you tend to get fatigued and this is where carb loading has helped me a lot to boost my energy to perform well on the ground. It has also helped me to enhance my endurance level to sustain myself for such long hours of the game. Cricket is a very high intensity sports whether it's T20 or one day and recovery has become one of the main aspects of the game and as a female vegetarian cricketer I have to make sure that I consume right amount of protein which will help me to recover well.

As a vegetarian you don't have too many options to meet your protein needs and this is where whey protein and casein has helped me a lot to meet my protein needs. I have been using whey protein and casein for more than 9 months and it has really helped me to recover well and be ready the next morning. Better recovery has helped me to perform well consistently on the field. This further has helped me to perform well and prevent myself from any injuries which are commonly associated with cricket.