Sports And Performance Nutrition

Prof: Geetha Ghaliyavar

Department Of Sports Nutrition

IIT Madras

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Lecture-20: Applied aspects of nutrient periodization

A warm hello, in this chapter we are going to be discussing how high fat diets can lead to fat adaptations for exercise. Why now you must be adapt to the fundamentals of macronutrients, carbohydrates, fats and proteins and how manipulating them, changing their type, their amount and changing the portions of these food groups, we can bring about changes in our exercise capacity. So by altering the quantity of these macronutrients we can bring about certain desired outcomes and let us learn about them. In the recent chapter of nutrient periodization I had already touched upon the concept of faster workouts, keeping the carbohydrate intake low before during and after workout, you can allow the body to adapt to different batteries of energies for exercise. If you recollect I had talked about how not consuming carbohydrates before during and after workout, you can make the body shift from a battery that was using glycogen or carbohydrates as fuel to the fat battery which uses the fatty acids as fuel for exercise. If you recollect in the fundamentals of carbohydrates, carbohydrates are the fuel for exercise and the immediate supply of energy that comes from the blood glucose which can last a few minutes and then the next supply comes from the liver which can store from 80 grams to about 100 roughly and that glycogen store also gets exhausted after about one and a half hours of exercise and then the muscle glycogen is obviously five times the store and can be very helpful for endurance workouts or athletes who do long distance activities such as cycling, marathon and triathlon.

However the body has enormous store of fat or adipose tissue. So by training your body to use fat as energy, you can allow exercise so by keeping the carbohydrate intake low, athletes can shift this gear to fat oxidation and allow for these gradual training adaptations. So by this technique of low carbohydrate and a high fat diet, athletes can also bring about body composition changes or physique transformation where they not only lower the body weight but also the fat percentage. So this is ideal for those who are looking to lose weight or for athletes who want to keep their body composition and lower their body weight or fat mass typically in the off season as I have been mentioning.

It's a given that you need to consume less calories so that you are in calorie deficit meaning you are moving more where the body is burning extra calories and your consumption of food is lesser than what you are spending. So it's always advisable to do this very sensibly across a few weeks. Crash dieting is not advisable and always leads to a yo-yo effect which is losing weight very fast and gaining it back also very easily. If one is not judicious about how they plan their weight loss journey, there's also a challenge of loss of muscle mass and lowered metabolic rate and this is honestly not what an athlete needs. Also these weight making strategies are very crucial for those athletes who are competing in a weight category sports be it the combat sports as Taekwondo or an equestrian or in weightlifting.

Athletes need to plan to compete in a specific weight category and this requires backwards planning definitely a couple of months ahead. So in this scenario where we are carb cutting automatically there are other macronutrients which need to increase. So since we are looking at a low carb meal automatically the addition comes from either protein or fats. However do note it is very important when you are trying to look at lowering your body weight overtly cutting calories which is not scientific is not advisable and we have discussed this in detail in the chapter of energy availability which was right in the beginning. So interestingly we calculate a minimum number of calories not by the kg body weight but by lean body mass and by lean body mass we refer to body weight minus the fat weight which gives you the lean body mass.

Lean body mass consists of organ weight, bone weight, muscle weight and water ad hoc and unscrupulous weight loss can negatively impact athletic performance not only that inadequate consumption of food or unnecessary starvation can also lower immunity particularly if an athlete has a high training load. So in this scenario the minimum requirement of carbohydrate intake should be at least 5 grams per kg body weight. minimum amount of carbohydrates is essential even if an athlete is in a tapering phase and has lower training load. To revisit fasted workouts not consuming any food before a workout to enhance fat oxidation is train low strategy and this is best suitable for low intensity workouts. An athlete who is not consumed any food will find it very difficult to sustain high intensity workouts.

There are several ways athletes can lower the carbohydrate intake either before workout even during workout and definitely after a workout. We have already discussed how an athlete can go into fat oxidation faster especially when the liver glycogen is lowered after overnight fast. Now what about after an exercise you can choose to consume high protein meals or high fat meals without carbohydrate in them. Similarly if you have two back to back sessions between the training you can also avoid consuming a carbohydrate meal or if your training is very late in the day you will skip carbohydrates in dinner and that way you will sleep low meaning you will go to bed without any carbohydrate intake. Also to be aware of what type of carbohydrates you can choose particularly when you consume very small amounts of carbohydrate through the day you may want to focus on moderate or a low glycaemic index.

If you recollect the basics of carbohydrates complex carbohydrates are those which are whole grains pulses such as chola or rajma with the skin on or sweet potatoes fruits like apple which are slow digesting. When the carbohydrate intake of a meal is low it is best to also ensure not only high quality of protein but in higher amounts too. High protein foods also help control appetite by increasing the appetite suppressing hormone called leptin and if you've seen a person who is skimping on carbohydrate you can imagine how irritable one must be. So for those individuals high protein diets offer complete proteins and if you recollect when we discuss the essential amino acids tryptophan is one of that and that directly impacts the serotonin or the feel good hormone. So it can keep you upbeat especially if you're thwarting your carb consumption.

When cutting carbohydrates if you recollect carbohydrates are protein spares and we learnt about this in the fundamentals of carbohydrate. So in this scenario adequate protein intake is important to not only maintain that muscle mass but perhaps also make up for that calorie deficit by cutting the carbohydrate food. High protein intake also suppresses the appetite stimulating hormone called ghrelin. So for those athletes who are making weight it is also best

to team high protein diets along with strength training which suppresses ghrelin hormone and most importantly on this note sleeping sound and continuous 7 to 8 hours is also known to suppress ghrelin hormone. We often see athletes sometimes not having the right guidance on how much weight to lose particularly in the weight category sports where the weighing in takes place either 24 hours prior or a few hours prior to the match sometimes athletes resort to unhealthy practices of weight making and we will learn about that in detail very soon in high performance chapters.

Always keep in mind it is safe to target less than 1kg of body weight loss one day prior to weighing. So it is best an athlete plants ahead in time and tries to stick within 2 to 3% range of the body mass and has at least a month or month and a half to lose that amount of weight. So of the three macronutrients if we are targeting to keep carbohydrate low and we understand the importance of protein in athletes the last of the macronutrient left is fats. So let's discuss high fat diets for athletes. I am sure you have heard about keto diets and there are several variations of that.

In this type of high fat diet 70 to 80% of the intake is from a fat source. Fats are alarmingly low as even 50 grams which is roughly about 3 chapatis for the entire day. So there is no consumption of fruits, milk or dairy products which contain lactose or starchy vegetables such as peas, corn or aloo and it is important to note in a high fat diet it is equally important to keep the protein modest while targeting a very low carbohydrate diet and ensuring high fat meals. Athletes are pushing their body to switch to the fat burning battery. So this is called ketosis.

This gets the body to adapt to using fat as fuel and if you recollect the energy systems that we have learnt fats oxidize only at a lower intensity where there is enormous supply of oxygen while some of the fuel still can be carbohydrate based burning of fats predominantly can suppress the use of glucose or glycogen for energy. So this way the athlete can bring about alteration or modifications to body composition. I am sure some of you have heard of this popular fat burner L-carnitine. L-carnitine is more like a vehicle that would perhaps take you from one place to the other. So L-carnitine takes the fats and pushes it into the mitochondria of the cell for it to be broken down.

But it is interesting for me to highlight there is more evidence for L-carnitine being an antioxidant that can enhance the recovery for an athlete rather than it is supporting fat burning and ironically for a weight loss strategy L-carnitine is long haul and works best when consumed for a long duration and with a high carbohydrate meal. Similarly a lot of individuals also consume MCTs or medium chain triglycerides to make up for the high fat intake. So apart the avocados, nuts, butter and ghee this MCT found in the coconut oil also has some benefits unlike the other fats which come from food that needs to be broken down MCTs can be used up directly for energy. So what is the takeaway message for weight making? Plan your weight loss strategy backwards keeping at least a couple of months at hand. So to summarize we did visit the concept of train low and compete high.

Carbohydrate is very crucial for exercise and carb cycling can be one way to ensure optimal performance. So can low carbohydrate and high fat diets help exercise or performance? High fat diets can help in fat adaptations and physique transformation however high fat diets do not support high intensity workout and hence those individuals who practice high intensity interval training or athletes in the peak competition season must support their training load with

adequate carbohydrate intake. To conclude low carbohydrate and high fat diets lower exercise capacity. Thank you for listening.