

Sports And Performance Nutrition

Prof: Geetha Ghaliyavar

Department Of Sports Nutrition

IIT Madras

Week-02

Lecture-09: Introduction to fats and its importance in performance

Other than carbohydrates and protein, fat is the last macronutrient. Let us understand what does fat do as a macronutrient? What are the food sources of fats, the good fats and the bad fats? Should athletes follow a high fat diet? Let's hear. And if you ever have given it a thought, what keeps you warm on a cold night? And what is the male sexual hormone testosterone made of? Heart and brain are the most important organs and apart the fluids that surround them, what else is protecting them? Fats are not just an integral part of each cell. They keep you warm. There's plenty of fat under the skin and also around your abdomen called the visceral fat. And if you're also thinking cholesterol is bad, sorry to bust that, the male sexual hormone itself is made from cholesterol.

Similarly, the most important vitamin, vitamin D also comes from cholesterol and fats also cushion important organs to protect them. And if you're somebody who skims on fat, you may want to reconsider. It is the fats in our diet that actually help absorb the fat soluble vitamins, A-D-E-K. And we'll learn more about these vitamins in detail in the next chapter.

Unlike the liver glycogen that can barely last a few hours, the body has enormous stores of fat, which is the adipose tissue. The adipose tissue itself can give you energy and all that extra food that you indulge in and the calories get siphoned off as storage and kept as adipose tissue. And that can give you energy for a long time. We've already discussed one gram of carbohydrates and proteins gives four kilocalories. Whereas one gram of that oil or ghee gives you over double the amount of calorie, which is nine kilo cal for every gram.

If you are the typical Indian who also enjoys a dollop of ghee and some butter on your food, you will know what makes it tasty and flavourful. Since foods that contain fat obviously have over double the calorie, unlike carbohydrates and proteins, they both give you a feeling of fullness or satiety. That means they also take much longer for digestion. So athletes who can consume larger portions of fats in their meals obviously have to think twice if they're training very close to consuming a meal as that. Interestingly, fats are also a source of energy for endurance workout.

At a low to moderate intensity of workout, a major chunk of the fuel can come from fatty acids. That also means that at a low to moderate intensity of workout, you are able to exercise at a comfortable pace where you can walk and talk. So that means there is a steady supply of oxygen that is needed in your breath. So unlike carbohydrate foods, the fuel economy of fats is different. Fats not only need more oxygen, they also offer energy at a much slower rate.

So what are the food sources of fats? As straightforward as it is, adding ghee to food is a source of fat. But do you think the dals, nuts or what you see in this photo as eggs or meat, don't they

already come with fats in them? So several food options like the oily fish to the avocado, which is about 50% of fat can be a hidden source of this macronutrient. The general recommendation of consumption of fat for an individual can be about 1 gram per kg body weight. So for a 55 kg of an average lady, that could be about 55 grams of fats. So do keep in mind that for each day of that 55 grams of fat intake, you only need to consume half of that as what you add addition to the other natural sources of fat that can come from the food. Meaning to give you an example and to make my math simpler, 50 grams of fat and half of it can come from the dairy, milk, nuts, dals and so on. So I don't need more than 25 grams of additional fats that can be added, such as oil and ghee into my food and cooking. And 25 grams of additional fats added is the upper limit. You can of course consume lesser than that. In the Indian cuisine, we seldom have meals consumed without cooking.

And most commonly, sunflower oil is typically used in many households for cooking. Though it is a polyunsaturated fatty acid, it has got slightly higher amounts of omega-6 than that is pro-inflammatory. So sunflower oil is best moderated and limit its use to a few dishes, though it has the highest smoke point and is best for deep frying. So that brings us to our focus on monounsaturated fatty acids. The most traditional oils, the Kachigani, are now what is quite pompous and popular, the cold pressed oils.

These Mufa oils are heart healthy and best to choose from the Indian varieties such as the cold pressed mustard oil, thill oil, the recent ones such as the rice bran oil and of course of the saturated oils, the cold pressed coconut oil can be used instead of ghee or butter and about half to one teaspoon the entire day is more than enough. And of course olive oil is not an Indian oil, but however it has some very important compounds that are irreplaceable and cannot be found in some of our traditional oils. The reason why I suggested that you limit your intake of ghee, coconut oil or butter is because it is a saturated fat and more than half to one teaspoon in a day is adequate. Now coming to the most important part of the polyunsaturated fatty acids. Of the PuFas, the Omega 3 is most important for an athlete.

Oily fish such as Indian salmon, mackerel, sardines and turvies are excellent sources of Omega 3. Omega 3 is made up of EPA and DHA, icoso pentanoic acid, docosa hexanoic acid. DHA forms a part of the retina and a chunk of the brain is also made up of it. So other than the brain and the eye health, Omega 3 has an extremely important role for athletes as I mentioned. Intense exercise and long hours of training in athletes can increase the exercise induced inflammation.

That means that there is a lot of oxidative stress and free radical damage. Consuming good quality of Omega 3 regularly can lower this exercise induced inflammation in athletic population and we know from research data that has confirmed especially in injury Omega 3 can preserve the muscle mass especially when an athlete is not able to train. However, these studies have used a very large amount of Omega 3. So about 2 to 5 grams of Omega 3 has improved muscle repair in injured athletes. There is also an important role of Omega 3 to help athletes recover from intense training.

As a dietician, if you are a pescatarian and can consume fish, that is the best option for you to choose these fish such as Indian salmon, sardines and mackerel at least 2 to 3 times in a week. Even better, smaller fish such as sardines and mackerel have lower mercury contamination and are safer fish. Approximately 100 grams of each of these fish can give you 2000, 1000 and about 500 mg of Omega 3 respectively. Are you one of those who loves deep fried fish? I am

sorry to burst your bubble but the way the fish is cooked can impact its Omega 3 content. Deep frying fish can lower the Omega 3 content.

It is best to cook the fish gently under modest heat. And if you are a vegetarian, I have not forgotten you. The vegetarian form of Omega 3, alpha linolenic acid is available in nuts such as walnut, flax seeds, watermelon pumpkin seeds, dark green leafy vegetables and avocado. Of course, olive oil is a good option. Keep in mind, seeds do have an anti-nutritional property called the cyanide.

So roast your flax seed very mildly and always powder them fresh to retain most of the Omega 3. Here is a cat. The way the body uses Omega 3 is in the form of EPA DHA. So the vegetarian ALA, the alpha linolenic acid has to be converted to EPA DHA. And that sadly is not a very efficient process.

So the conversion rate can be very poor between 5 to 15% only. And it is a complicated one, dependent on several vitamins and some minerals. That is where a fish oil capsule comes into the picture. Even for the ones who can eat fish and don't enjoy it much, there is an alternative. So a fish oil capsule can be very convenient to consume a large dose of Omega 3.

Even for a vegetarian athlete who shies away from consuming fish, this can be easy to consume. What if you are deterred by the fish burps? I am asked in my consultation that, you know, I suffer from fish burps. Well, if you choose a good brand, I definitely can assure you, you don't have to go through the ingredients. But if you still suffer from that, here is a simple solution. You can refrigerate the fish oil capsules and that can help you lower this side effect.

Is there a best time to consume the Omega 3? The good news is, this unlike some minerals, vitamins, which are ideal to be taken only around a certain time, has no restriction. And especially if you are concerned about the fish burps, consume Omega in any meal and that can prevent any discomfort. I really wanted to take some time to discuss about trans fats. There are some naturally available trans fats in dairy and in red meats. But they are very safe and you don't have to be concerned about them at all.

But the man made trans fats, they are the culprits that can cause further inflammation in athletes and lead to abnormal or deviated cholesterol, typically increasing the bad cholesterol. Sadly, you find trans fats in all the tasty food items, from fast food to fried items, especially which are commercially made, where the oil has been recycled and reused. And in all those yummy cakes and cookies, where the butter is subjected to very high temperature, the trans fats get formed. Therefore, it is best for athletes, particularly in the peak competition cycle, to restrict eating from outside. And if your mummy tells you, please eat home cooked meals, I second that.

Avoid and limit trans fats. The guidelines are to consume less than 1% of trans fat daily. Do remember, a food label that reads trans fats free can still contain less than 0.5 grams of trans fats. So these trans fats not only increase the bad cholesterol, they also unfortunately lower the good cholesterol or the HDL. When athletes are already challenged with exercise induced inflammation, consuming plenty trans fats is adding fuel to fire.

So is there a correlation to the time of fat consumption and exercise training? As I already walked you through how fats are calorie dense, they obviously take longer to digest. If you have adequate time gap of 2 to 3 hours before training, meals with higher fat can still get digested. To give you an example, you went to a party and over indulged in all the dishes and

some with very high amount of fats, that could be either a dessert as Jamun or any deep fried item and you are worried about going back to training. And I can already predict you are going to be sluggish and you may even perhaps miss your training that day. That's because the fats have taken predominance and longer to digest.

So it beats the purpose for an athlete to consume high fat meals just before training. Similarly, after an intense training session when the focus should be on enough hydration to refuel and replenish the lost glycogen store, consuming high amounts of fats can slow down digestion and that offsets the recovery process. Interestingly, the medium chain triglycerides can be beneficial for athletes as they get quickly absorbed from the intestine and are siphoned off to the liver and get burned during exercise. What are the reset suggestions for those athletes who want to follow a high fat low carbohydrate diet? High fat diets can allow you to consume the large lion share of calories coming from fatty foods. While limiting to less than 50 grams of carbohydrate over weeks, this pushes the body to burn the stored adipose tissue of fats for exercise fuel.

But we now have conclusive studies to say that low carbohydrate and high fat diets lower performance. So what can be an ideal balance for those athletes who want to lower their body weight and fat mass and push fat burning for endurance workouts? Train low, which is during most training days, you can try to adapt to high fat diets and deliberately steer clear from your rice roti to enhance these body composition transformations. However, in the peak competition cycle, the guidelines and the suggestions today are to go back to eating high carbohydrate to have the best performance outcomes. So for those athletes who want to try this, do keep in mind that this process takes a few weeks to adjust to fats get burnt only in low to moderate intensity activity to convert to energy. So the recommendations are train low, which means that you can opt for high fat diets in training, but in the peak competition season, you need to go back to consuming adequate carbohydrates for recovery and performance.

To summarize, choose heart healthy traditional Indian oils, prioritize consuming omega-3 rich foods to help lower exercise induced inflammation. Also, if you are in injury rehabilitation, omega-3s can support repair and recovery, along with maintaining muscle mass and of course that's at a higher dosage. Athletes should restrict commercially available fast food and bakery items to limit their trans-fat intake. High fat diets can lower performance, especially if you are also consuming low amount of carbohydrate. So in the competition season, to ensure adequate intake of carbohydrates, that is train low and compete high.

Thank you for listening. Namaskar. I am Gaurav Rana. I am an international suitor. I am a vegetarian naturally, so I am very happy to be able to help you. I have been working on the body workout for omega-3 and the requirements are very good. Like that, muscles, brain, body recovery, and other things are very good.

One must take walnuts and Badams for omega. Omega 3 tablet can supplement this need it will improve your mind. Overall, I think that the body will improve. So, Omega is the best option for the body.