dell children's
Ascension

A STRUCTURE FOR NUTRIENT TIMING

By Isabel Alvarado MS, LAT, ATC
ATHLETIC TRAINER AT DELL CHILDREN'S

Carbohydrates are biomolecules made up of hydrogen, carbon, and oxygen and are split up into three different classes: sugars, oligosaccharides, and polysaccharides (Smith-Ryan &Antonio, 2013). They are vital sources of energy, containing 4 kilocalories per gram (Smith-Ryan &Antonio, 2013). Carbohydrates are important fuels for exercise due to the increased amount they are utilized by working skeletal muscles (Smith-Ryan & Antonio, 2013). Regardless of what type of exercise is being done carbohydrates are utilized, but as the intensity of exercise increases so does the body's reliance on carbohydrates as an energy source (Smith-Ryan & Antonio, 2013).

3-4 hours before exercise (200-300 grams): increases muscle glycogen stores and performance; prevents fatigue

> ***Examples:*** pasta, pancakes/waffles, yogurt with fruit, eggs with toast, cream cheese bagel, chicken and rice

30-60 minutes before exercise (50-75 grams): increases plasma glucose and insulin concentrations

> ***Examples:*** granola bars, crackers, sports drink, banana/apple/orange

During exercise (30-60 grams): immediate source of energy; mainly beneficial for endurance athletes

> ***Examples:*** sports gels, sports drink

After exercise: helps improve muscle and liver glycogen storage

> ***Examples:*** pasta, chicken and rice, baked potato with steak

Proteins are the building blocks of skeletal muscle due to the amino acids found in them (Smith-Ryan & Antonio, 2013). Athletes consume anywhere from 50 to 175% more protein than non-athletes in order to recover faster and rebuild/repair skeletal muscle after training and/or competitions (Smith-Ryan & Antonio, 2013). According to the Dietary Reference Intake (DRI), the daily recommended amount of protein is 0.8 grams per kilogram of body weight. For athletes, however, anywhere from 1.4 to 2 grams per kilogram of body weight daily is considered safe and may improve training adaptations (Campbell et al., 2017).

Before exercise: (20-30 grams): increases muscle protein synthesis

During exercise: (15 grams per hour): helps prevent muscle breakdown but is really only necessary for athletes training multiple times a day

After exercise: (30 grams): helps with protein synthesis for repair and adaptation (rebuilding) Fats that athletes should be focused on consuming are PUFA's particularly omega-3 and omega 6's such as: fish, nuts, and oils (Smith-Ryan & Antonio, 2013). Polyunsaturated fats are important to consume since they are essential fats, meaning they are necessary for normal body function, but the body cannot make them (Smith-Ryan & Antonio, 2013).