**EXERCISING SAFELY WITH MSUD**

**By Karen Dolins, MSUD Mom and Board Certified Specialist in Sports Dietetics**

Children with MSUD want to live normal lives, and that includes participation in sports. More and more parents are asking their doctors and dietitians how to modify their children’s nutrition plan to keep blood leucine levels in a safe range while they play soccer, tennis, baseball, and more. The nutritional needs of physically active individuals with MSUD have not yet been studied, but understanding some basic sports nutrition concepts can help guide us. This article will discuss the ways in which physical activity affects the need for calories, carbohydrate, protein, and fluid.

**Calories**

Muscles need energy to move. The amount of energy used is measured in calories. In MSUD, it is critical that energy balance is maintained to prevent breakdown of muscle which releases leucine and causes a rise in blood leucine levels. This means that the energy cost of activity must be balanced by the amount of energy (calories) taken in through food and formula.

**Carbohydrate**

Active muscles use a combination of fat and sugar for fuel. Sugar is derived from carbohydrate foods which include the starches used in most low protein food products, fruits, vegetables, juice, sweetened beverages, jellies, and candy. Sports drinks provide sugar along with fluid and electrolytes, usually sodium and potassium which may be lost in the sweat. High intensity exercise (a sprint) is fueled mostly by sugar while lower intensity exercise (a walk) uses more fat. Fortunately, sugar is not limited in the MSUD diet and most low protein foods are high in this nutrient!

**Protein**

While dietary supplement companies would have you think otherwise, protein is not typically used to fuel activity and a normal diet will provide enough protein to build muscle. Sports nutrition scientists advise those who are trying to build muscle to eat enough protein to meet the body’s needs but to get extra energy from carbohydrate foods. This is good news for the athlete with MSUD! You may have heard that leucine is especially important for building muscle. This is true, but with MSUD blood levels of this nutrient are almost always higher than they are in a person without MSUD. As long as you are taking your formula as prescribed (preferably 3-5 times daily), adequate protein will be available to build muscle. The bottom line is that muscle building is more likely to be limited by consuming too few calories or carbohydrates than by the protein restriction needed in the MSUD diet.

**Fluids**

Hydration is an important strategy for any athlete person, and the active individual with MSUD is no exception. The body is about 60% water by weight. Sweat causes some of this water to be lost, which puts strain on the body and has been found to impair athletic performance. For the exerciser with MSUD, this can also be dangerous. It is possible to estimate fluid needs by weighing oneself before and after activity (minimal clothing should be worn so you’re not weighing sweat trapped in the fabric). A loss of one pound indicates a fluid loss of 2 cups. Athletes maintain hydration most effectively by knowing their fluid needs and drinking to a schedule rather than to thirst. Sports drinks can be particularly helpful for the athlete with MSUD as they provide calories as well as fluid and the sugar and electrolytes they contain helps keep fluid in the body.

**Tips for exercising safely with MSUD**

* Make sure calorie intake is adequate by monitoring body weight.
* Include carbohydrate foods with all meals and snacks.
* Consume medical formula 3-5 times throughout the day to ensure adequate protein availability.
* Drink fluids throughout the day and consider sports drinks especially when exercising in hot and humid conditions.

Always check with your medical team and dietitian about making adjustments to your nutrition plan.