Sports Nutrition For College Swimming

Kristy Trumbo
Nutrition Overview

- Current research has found that physical activity, athletic performance, and recovery from exercise are enhanced by optimal nutrition.
- Proper selection of foods and fluids and timing of intake are best for optimal health and exercise performance.
Energy/Calories

- The only way to have energy to swim is to consume enough calories.
- Meeting calorie needs is a nutrition priority for athletes.
- When calorie output equals calorie intake you have calorie balance.
- Role of calories in athletes is: supporting exercise activities, daily living activities, and basic body functions.
Energy/Calorie Requirements

- Calorie intake needs depend on body size as well as activity and its intensity, and duration.
- Inadequate calories can compromise athletic performance.
  - Fat and lean tissue will be used for fuel by the body.
  - Loss of lean tissue mass can cause a loss of strength and endurance.
Carbohydrates

- Carbohydrates are the best source of fuel, especially for nerve cells, and the brain.
- Plate should be: ½ fruits and vegetables, ¼ protein and ¼ should be carbohydrates.
Carbohydrates

- Muscle glycogen is the primary carbohydrate in an athlete's working muscle that provides energy during exercise.
- Glycogen is then depleted as one exercises.
- As glycogen stores become low, athletes may experience what many refer to as “hitting the wall” or “bonking.”
- This causes athletes to feel tired, weak, confused, nauseated and may not be able to continue their workout.
Carbohydrates

- Therefore, consuming food and beverages high in carbohydrates can aid in preventing “hitting the wall” while helping with improving athlete’s performance.
- Carbohydrates can benefit performance by helping maintain blood glucose and glycogen levels while replacing fluids and electrolytes lost with sweating.
- Sufficient carbohydrates will allow athletes to sustain faster and longer workouts.
Carbohydrates

Sources of carbohydrates include fruits, vegetables and whole grains. In addition these foods supply fiber, vitamins and minerals.

Foods:
- Cliff Bar (2.4 oz) - 45g carbohydrates
- Power Bar (2.25 oz) - 42 g carbohydrates
- Large apple - 50 g carbohydrates
- Raisins (3/8 cup) - 100 g carbohydrates
- Skim milk (1 cup) - 100 g carbohydrates
Protein

- Having the proper amount of calories from carbohydrates allows protein in the diet to be used for preservation of lean mass.
- It does this by building and repairing lean mass broken down during exercise.
- For this reason, carbohydrates instead of protein should be used as primary sources of calories during exercise.
Protein

- The recommended serving size for protein is 3-4 ounces of meat, which is about the size of a deck of cards.

- High Quality Protein Sources:
  - Lean meats, poultry, fish, eggs and egg whites, low fat dairy products, beans, and soy products
Fat

- Fat is an important energy source for maintaining general health.
- High intensity exercises will cause an athlete’s body to rely more on carbohydrates than fat.
- As activity length increases though, the more the body relies on fat as it’s fuel source.
Fat

- Athletes, like all people should consume a diet lower in saturated fat and cholesterol.
- If fat consumption is too low, this could be detrimental to training and performance.
Fat

Types of fats:

- Unsaturated fats: Most are liquid at room temperature. These fats will decrease the risk of heart disease. Examples include: vegetable oils, avocados, nuts and seeds.
- Saturated fats: Are solid at room temperature. These fats increase the risk of heart disease. Examples include cheese, meats, and dairy.
Vitamins and Minerals

• As an athlete’s caloric needs increase, it is important to consume a well balanced diet to meet vitamin and mineral needs.
• Vitamins and minerals play important roles in the energy pathways to supply energy and aid in recovery after workouts.
• Athletes should consult a physician or dietitian before taking any supplement if they feel they cannot meet vitamin and mineral needs.
Vitamins and Minerals

- If an athlete does not meet calorie and vitamin/mineral needs through the diet, a supplement will NOT enhance athletic performance.
Electrolytes

- Sodium, Chloride, and Potassium:
- Electrolytes are present in the human body, and the balance of the electrolytes in our bodies is essential for normal function of our cells and our organs.
- Electrolytes are lost in sweat and dehydration.
- Sodium and Potassium are the most important electrolytes depleted in sweat.
- They must be replaced when significant amounts are lost, through sports drinks and by eating a variety of fruits, vegetables, nuts, seeds, dairy foods, lean meats, and whole grains.
Fluid and Hydration

- Since swimmers are always surrounded by water, they may not pay attention to fluids. However, it is important for swimmers to drink the proper amount of fluids to prevent dehydration.
- A loss of athletic performance can be seen with just a 2% loss of body weight as water!
- Dehydration can affect performance and threaten health.
Fluid and Hydration

- If dehydration reaches 5% of body weight, cramping and heat exhaustion can result.
- Athletes should drink every 15-30 minutes during exercise (5-10 oz fluids)
- It is important for athletes to replenish their bodies with the proper amount of fluids and electrolytes before, after and during exercise.
Fluid and Hydration

“Drink early, and Drink Often”- athletes should not wait until they are thirsty before drinking; they may already be dehydrated.

Athletes should begin drinking fluids before their workout begins and should continue to drink throughout the workout.

Athletes should be careful with drinking too much water because this may lead to overhydration, which dilutes electrolytes, especially sodium.

To prevent overhydration, the best approach for athletes would be to drink an electrolyte replacement drink (sports drink) rather than plain water.
Monitoring Hydration Status

- Many athletes finish a workout or competition dehydrated.
- A good marker of how much sweat was lost during exercise is body weight.
- Athletes can weigh themselves before and after practice to determine how much weight was lost from sweat.
- For every pound that is lost: athletes should drink about 2-3 cups of fluid for replenishment.
- Athletes should continue to drink fluids throughout the day to get back to their pre-exercise weight and should eat salty foods throughout the day to replace electrolytes lost.
Monitoring Hydration Status

- Another important way athletes can check hydration status, and the easiest is urine color and volume.
- If an athlete’s urine is light in color/clear during normal urination, they are properly hydrated.
- If an athlete’s urine is dark in color (very yellow) during normal urination, they are not properly hydrated.
- Be aware though: some vitamins color urine if taken in large supplemental doses.
Monitoring Hydration Status
Pre Exercise Meal

- To prevent hunger and provide energy, athletes should eat meals and snacks before exercise.
- These meals should be low in fiber, easy to digest, high in carbohydrates and moderate in protein.
- Example:
  - A package of peanut butter crackers with a banana
  - Yogurt with whole grain cereal
  - Sports Bar (Luna, Clif Bar, Powerbar)
  - $\frac{1}{4}$ cup of nuts and a medium apple, or an orange
During Exercise

- Athletes should ensure they are drinking plenty of water and fluids.
- Drinking 6-12 oz of a drink with carbohydrates every 15-20 minutes can provide the proper amount of carbohydrates and energy for a workout.
- Examples:
  - Gatorade
  - Powerade
  - Propel
Recovery

- What an athlete puts into their body the night before will help fuel the body the next morning for practice.
- The standard rule of thumb is attempt to eat within the first 30 minutes to 2 hours after competition or practice because the body is three times more receptive to replacing muscle glycogen.
- Ex. Chocolate milk- contains optimal carbohydrate to protein ratio, which is critical for helping refuel tired muscles after strenuous workouts and get the body ready for the next workout.
Sample Pre-Exercise Meal for a Morning Event

- Dinner (day before)
  - 2 cups spaghetti (60g carbohydrates, 320 calories)
  - 1 cup pasta sauce (30 g carbohydrates, 125 calories)
  - 1 cup mixed greens (5 g carbohydrates, 25 calories)
  - 1 dinner roll, plain (15 g carbohydrates, 80 calories)
  - ½ c. cooked broccoli (5 g carbohydrates, 25 calories)

Total: 115 g carbohydrates, 575 calories
A Sample Pre-Exercise Meal for a Morning Event

- **Bedtime Snack**
  - 1 cup orange juice (30 g carbohydrates, 120 calories)
  - 1 small banana (15 g carbohydrates, 60 calories)
  - 1 granola bar (15 g carbohydrates, 60 calories)
  - Total: 60 g carbohydrates, 240 calories

- **Light Breakfast**
  - 1 ½ cup Cheerios (45 g carbohydrates, 180 calories)
  - 1 cup skim milk (12 g carbohydrates 80 calories)
  - 1 small banana (15 g carbohydrates, 60 calories)
  - Total: 72 g carbohydrates, 320 calories
Breakfast Choices

- Oatmeal packet with a banana and a cup of hot cocoa or milk
- A bagel or 2 slices of bread with 2 tablespoons of peanut butter, a yogurt or glass of milk and a piece of fruit
- 2 cereal bars with a container of yogurt and fruit
- 2 scrambled eggs with 2 slices of toast and a piece of fruit and milk.
- An Egg McMuffin and a piece of fruit
- A bowl of cereal with low-fat milk and a piece of fruit
Lunch Choices

- Pasta with sauce with a salad (2 tablespoons of dressing) and a glass of low-fat milk with protein on the salad or in the sauce
- 2 medium slices of cheese pizza and a salad or a piece of fruit
- A 6 inch sub sandwich with cheese, turkey, ham, or roast beef and assorted vegetables, a piece of fruit and a glass of milk.
- Peanut butter sandwich, yogurt, fruit and a glass of milk
- A salad with chicken/turkey and/or cheese, or eggs and beans and 2 tablespoons of dressing, a roll or a bagel with a thin spread of peanut butter
Dinner Options

- Chicken and vegetable stir-fry over brown rice
- Cheese tortellini with marinara sauce and a salad
- 6 inch hoagie (turkey, ham, roast beef, cheese and veggie) and a salad or soup
- 2 fajitas or tacos (shrimp, beef, chicken, cheese with vegetables)
- Chili and a roll
- A veggie burger and yogurt or milk
- 2 slices of thick crust pizza and a 1 cup of salad
- An omelet (vegetables and low-fat cheese) with a whole grain bagel
- A grilled chicken salad and a baked potato with low fat cheese and broccoli on top
Afternoon Snack

- Mix of 1 cup of cereal, dried fruit and ¼ cup milk
- Frozen yogurt cone
- A sports bar (Balance, Luna, Cliff, Powerbar)
- ¼ cup of nuts and a piece of fruit
- Yogurt with cereal and or fruit

Evening Snack

- Fruit Smoothie with low fat milk or yogurt
- 2 tablespoons of peanut butter with crackers
- Snack size bag of microwave popcorn
Dietary Supplements and Ergogenic Aids

- Many athletes seek to “fine-tune” their training and nutrition by taking supplements or ergogenic aids which they may believe may give them enhanced performance.

- Many producers of supplements make claims that appeal directly to athletes and very few can support their claims through scientific study and research.
Dietary Supplements and Ergogenic Aids

- Lack of FDA testing on supplements can lead to possible contamination of dietary supplements and ergogenic aids. Because of this, banned substances is an issue of concern for athletes.
- Proceed with caution when considering the use of these types of products and consult with a MD or RD.
- Dietary supplements or ergogenic aids cannot substitute for genetic factors, years of training, and overall good nutrition.
Female Athlete Triad

- The female athlete triad is a combination of disordered eating, amenorrhea, and low bone density.
- Result of eating low or very low energy diets.
- This restrictive eating and intense training results in: amenorrhea, low levels of estrogen, and bone density loss (osteoporosis).
- Symptoms of the female athlete triad are: fatigue, poor performance, inability to gain weight with strength training, feeling cold, extreme mood changes.
Iron

- All athletes, especially female endurance athletes are at risk for iron depletion.
- This is due to heavy sweating, and/or menstrual losses.
- Insufficient iron intake or decreased uptake of iron into the blood are the most probable causes of poor iron intake.
- Low iron stores, can cause decreased endurance and performance.
- Good food sources of iron: Meat, fish, poultry, beans, enriched cereal, green leafy vegetables, eggs, dried fruits such as raisins and dried figs.
Osteoporosis

- Low calcium intake can lead to increased risk of stress fractures and decreased bone density, particularly in amenorrheic athletes.
- Calcium is important for growth, maintenance and repair of bone tissue, muscle contraction, and normal blood clotting.
- Peak Bone Mass: 18 girls, 20 in boys.
- Female athletes are at greatest risk for low bone-mineral density if calorie intakes are low, dairy products and other calcium-rich foods are low or eliminated from the diet, and if they have menstrual dysfunction.
Foods rich in Calcium

- Yogurt, milk (low fat or nonfat)
- Cheese, including american, ricotta, cheddar cheese and mozzarella cheese
- Milk shakes
- Salmon
- Tofu
- Spinach, broccoli, brussel sprouts, peas,
- White beans, baked beans
- Almonds
Any Questions or Comments ?
References

- Pre-Workout/Pre-Race Nutrition. (n.d.). Retrieved April 4, 2009, from USA Swimming:
  http://www.usaswimming.org/USASWeb/ViewMiscArticle.aspx?TabId=395&Alias=Rainbow&Lang=en&mid=614&ItemList=533