

PROJECT 3: Nutritional Recovery Solutions

Part I: Nutrition for Recovery

Recovery from athletic performance, physical activity, and exercise is enhanced by optimal nutrition. Meeting energy needs is a nutrition priority for athletes because optimum athletic performance is promoted by adequate energy intake. Energy and nutritional needs must be met during times of high physical activity in order to maintain body weight, replenish glycogen stores, and provide adequate protein to build and repair tissue. Restricting energy intake, using severe weight-loss practices, eliminating one or more food groups from the diet, or consuming unbalanced diets with nutritional deficiencies may require supplements. Because the poor enforcement of the regulations specific to nutritional supplements, they should be used with caution and careful product evaluation. A qualified sports dietitian, who is a Board Certified Specialist in Sports Dietetics in the United States, should provide individual nutritional and supplementation assessment.

Athletes need to consume adequate energy during periods of high-intensity or long-duration training to maintain body weight and health and maximize training effects. Low energy intakes can result in loss of muscle mass, loss of bone density, an increased risk of fatigue, injury, and illness, and a prolonged recovery process. Athletes should consume diets that provide at least the recommended dietary allowance for all nutrients. Before exercise, a meal or snack should provide sufficient fluid to maintain hydration, be relatively low in fat and fiber, be relatively high in carbohydrate to maximize maintenance of blood glucose, be moderate in protein, be composed of familiar foods, and be well tolerated by the athlete. During exercise, primary goals for nutrient consumption are to replace fluid losses and provide carbohydrates for maintenance of blood glucose levels. These nutrition guidelines are especially important for endurance events lasting longer than an hour when the athlete has not consumed adequate food or fluid before exercise or when the athlete is exercising in an extreme environment where the heat, cold, or high altitude are of concern.

After exercise, dietary goals are to provide adequate fluids, electrolytes, energy, and carbohydrates to replace muscle glycogen and ensure rapid recovery. Carbohydrate intake during the first thirty minutes and again every two to six hours will be adequate to replace glycogen stores. Protein consumed after exercise will provide amino acids for building and repair of muscle tissue. In general, no vitamin and mineral supplements are required if an athlete is consuming adequate energy from a variety of foods to maintain body weight. A multivitamin or other mineral supplement may be appropriate if an athlete is dieting, habitually eliminating foods or food groups, is ill or recovering from injury, or has a specific nutrient deficiency. Vegetarian athletes may be at risk for low intakes of energy, protein, fat, and key other nutrients. Consultation with a sports dietitian is recommended to avoid these nutrition problems. Proper recovery nutrition efforts are essential when there is a second training or competitive session during a single day.

Dehydration decreases exercise performance and adequate fluid intake before, during, and after exercise is important for health and optimal performance. The goal of drinking is to prevent dehydration

from occurring during exercise and individuals should not drink in excess of sweating rate. After exercise, athletes should strive to consume approximately 16–24 oz. (450–675 mL) of fluid for every pound (0.5 kg) of body weight lost during exercise. Being well hydrated is an important consideration for optimal exercise performance. Because dehydration increases the risk of potentially life-threatening heat injury such as heat stroke, athletes should strive to maintain proper hydration before, during, and after exercise. Dehydration can compromise athletic performance, particularly in hot weather, and may impair mental and cognitive performance. Because many athletes do not consume enough fluids during exercise to balance fluid losses, they complete their exercise session dehydrated to some extent. Given adequate time, intake of normal meals and beverages will restore hydration status by replacing fluids and electrolytes lost during exercise.

Next to physical training, taking control of your nutrition is the best way to impact athletic performance. Assuming a proactive and educated stance in regards to recovery nutrition is a specific area where most athletes and their parents can truly make significant gains. Much of the issue, especially with younger athletes, is appropriate meal and snack selection during recovery from athletic training or competition. Practical and realistic ingredient combinations along with palatability with the younger athletes can be a difficult and often frustrating endeavor for parents, coaches, trainers, and the athletes themselves. As a baseline, recovery snacks and meals should strive to provide the athlete with about 10 grams of protein and between 100-150 grams of carbohydrates that possess a moderately high to high glycemic index. Below are six examples of recovery meals and six examples of recovery snacks that closely meet these nutritional requirements. These are provided to help illustrate the content and serving size of these meals and snacks.

As noted above, hydration requirements for athletes are essential to maintain. Sports drinks can be used but can significantly impact total carbohydrate intake. Generally speaking, a single 22 ounce sports drink can provide all of the athlete's carbohydrate needs in regards to recovery. However, these drinks can also be expensive, contain high levels of sugar or caffeine, and many do not address protein requirements for recovery. For the purposes of this education piece it is being suggested that recovery nutritional requirements be met through foods. The meals and snacks below meet the recovery nutritional requirements and therefore it is being suggested that the athletes drink water with them. As far as preparation is concerned you can usually add spices such as salt and pepper as needed for taste and other spices can be used to add variety or interest. Low-fat or non-fat margarines or spreads should be used to keep fat intake low. These suggestions should act only as a guide and experimentation with meals and their preparation is highly recommended. If the athlete is not interested in the foods then it is likely that they will not be willing to consume the appropriate combinations of nutrients that will help to enhance their recovery from athletic performance. Directly below are included several nutritional resources that will help assist in the selection of an optimal recovery meal.

Additional Resources:

[Carbohydrate Content of Common Foods.pdf](#)

[Protein Content of Common Foods.pdf](#)

[Glycemic Index and Load of Common Foods.pdf](#)

Part II: Recovery Meals

Meal 1: *Baked Fish with Rice and Sweet Potatoes with Fresh Pineapple and Dessert*

1/2 baked fillet Atlantic perch (5.97g of protein/0g CHO)

¼ cup of cooked long grain rice (1.25g protein/36.98g CHO)

½ cup of cooked sweet potatoes (2.1g protein/26.93g CHO)

1 cup of fresh pineapple (0.84g protein/20.34g CHO)

½ slice of commercially prepared pecan pie (2.26g protein/64.64g CHO)

TOTAL: 12.42g protein/148.89g CHO

Suggestions: Try marinating fish with fresh squeezed lemon juice before baking then again once fish is done. Add small amount of fat-free margarine to sweet potatoes or sprinkle with a small amount cinnamon or brown sugar before serving. Try cooking the diced pineapple over the fish as a relish.

Meal 2: *Mushroom and Black Olive Pizza with Fruit Cocktail and Dessert*

1 slice of cheese pizza (6.53g protein/18.28g CHO)

1 cup shiitake mushrooms sliced & baked onto pizza (2.26g protein/20.87g CHO)

10 black olives sliced and baked onto pizza (0.36g protein/2.76g CHO)

1 cup fruit cocktail without syrup (1.09g protein/28.11g CHO)

1 cup vanilla ice cream (4.62g protein/31.16g CHO)

Suggestions: For a bit more interest and flavor try sprinkling pizza slice with a small amount of mozzarella or parmesan cheese or a dash of tabasco sauce before serving.

TOTAL: 14.83g protein/101.18g CHO

Meal 3: Homemade Cornbread and Beans with Two Desserts

½ cup pinto beans prepared (7.7g protein/22.42g CHO)

1 cup raw fresh onion into beans (1.76g protein/14.94g CHO)

1 medium raw fresh tomato cut up into beans (0.18g protein/0.78g CHO)

1 piece of yellow cornbread from dry mix (4.32g protein/28.86g CHO)

1 slice yellow cake with chocolate frosting prepared (2.24g protein/37.63g CHO)

½ cup flavored Italian ice dessert (0.03g protein/15.66g CHO)

TOTAL: 16.23g protein/120.29g CHO

Suggestions: Try spicing up the beans by adding a chopped jalapeno or chile pepper while cooking. For a bit less protein try skipping the cornbread altogether and eat the beans like a soup.

Meal 4: Fresh Country Style Green Beans with Italian Bread and Pineapple Upside-Down Cake

1 cup fresh green beans prepared & cooked (2.36g protein/9.85g CHO)

1 slice of finely chopped cured pork bacon into beans (2.34g protein/0.9g CHO)

1 cup fresh chopped onion into beans (1.76g protein/14.94g CHO)

1 fresh sliced tomato into beans (0.18g protein/0.78g CHO)

1 slice of Italian bread toasted (1.76g protein/10g CHO)

1 slice of Pineapple upside-down cake prepared (4.03g protein/58.08g CHO)

TOTAL: 12.43g protein/94.55g CHO

Suggestions: For a vegetarian option simply omit the chopped bacon and try adding fresh lemon juice to the green beans or sprinkle with a small amount of mozzarella or parmesan cheese. For best results do not overcook the beans.

Meal 5: Whole Wheat Spaghetti with Tomato Sauce, Garlic Bread, and Angel Food Cake

1 cup whole wheat pasta cooked (7.46g protein/37.16g CHO)

1 cup ready to serve pasta tomato sauce (4.45g protein/34.40g CHO)

2 small fresh tomatoes diced and cooked into past sauce (0.36g protein/1.56g CHO)

1 slice Italian bread toasted with garlic powder to taste (1.96g protein/10.5g CHO)

1 slice angel food cake prepared (1.65g protein/16.18g CHO)

TOTAL: 15.52g protein/99.8g CHO

Suggestions: Add mushrooms, bell peppers, squash, zucchini, or your other favorite vegetables to the sauce for additional heartiness. Add a small amount parmesan cheese to top the sauce. Spread a small amount of fat-free margarine over the garlic bread before toasting.

Meal 6: *Mexican Tostada with Chocolate Covered Bananas*

1 Tostada with guacamole (6.24g protein/16.01g CHO)

1 fresh tomato diced (0.18g protein/0.78g CHO)

1 cup ice berg lettuce shredded (0.5g protein/1.63g CHO)

2 cups sliced fresh bananas (3.28g protein/68.52g CHO)

2 tablespoons chocolate syrup (0.78g protein/24.42g CHO)

TOTAL: 10.98g protein/111.36g CHO

Suggestions: For more spice add a small amount of diced fresh jalapeno or fresh salsa to your tostada or for extra protein add a few black beans to the top. Try the dessert with frozen chocolate covered bananas for a cooler treat.

Part III: Recovery Snacks

Snack 1: *Bagel and Bananas*

1 plain 4" bagel (8.92g protein/44.95g CHO)

2 bananas (2.58g protein/53.9g CHO)

TOTAL: 11.5g protein/98.85g CHO

Snack 2: *Graham Crackers and Honey*

2 cups of graham crackers (11.6g protein/129.02g CHO)

1 tbsp. honey (0.06g protein/17.30g CHO)

TOTAL: 11.66g protein/146.32g CHO

Snack 3: *Chocolate Milkshake and Applesauce*

11 oz. chocolate milkshake (9.15g protein/63.45g CHO)

1 cup applesauce (0.46g protein/50.77g CHO)

TOTAL: 9.61g protein/114.22g CHO

Snack 4: *Cinnamon Raisin Bagel with Pairs*

1 cinnamon raisin bagel 4" (9.43g protein/49.13g CHO)

1 cup canned pairs in syrup (0.53g protein/50.99g CHO)

TOTAL: 9.96g protein/100.12g CHO

Snack 5: *Chunky Peanut Butter Pita with Bananas and Pretzels*

1 tbsp. Chunky Peanut Butter (3.85g protein/3.45g CHO)

1 banana sliced (1.29g protein/26.95g CHO)

1 plain pita 6 1/2" (5.46g protein/33.42g CHO)

10 snack pretzels salted (6.2g protein/47.52g CHO)

TOTAL: 16.8g protein/111.34g CHO

Snack 6: *Tropical Trail Mix with Apples and Honey*

1 cup tropical trail mix (8.82g protein/91.84g CHO)

1 apple sliced (0.36g protein/19.06g CHO)

1 tbsp. honey (0.06g protein/17.30g CHO)

TOTAL: 9.24g protein/128.2g CHO