



POWER BACK DIET John Underwood American Athletic Institute

DIET NUTRITION SUMMARY

WHAT YOU PUT IN YOUR BODY IS WHAT YOU WILL GET OUT OF IT...

Research has shown that practicing proper methods of nutrition is essential to maximizing your athletic performance. Peak physical performance can only occur when the body is supplied with an adequate amount of essential nutrients. Using improper methods of nutrition will decrease your level of performance. The Power Back Diet provides the necessary information to help you achieve the highest level of performance possible. The psychological advantages of maintaining good nutritional practices are great: you'll compete better if you feel good physically and mentally. You will also compete better knowing that you have done everything possible to be at your best.

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It must also be noted that athletes must take some food into the body every four hours. This prevents low blood glucose levels which in turn reduce cortisol, the stress hormone from being released, which is responsible for tearing down muscle capacity.

You cannot run on empty. A hand full of raisins or a couple bites of a power bar or a few sips of watered down Gatorade or fruit drink can keep you blood glucose level up and you alert and physically responsive. You cannot train or compete at optimal levels with low blood glucose levels. Remember your brain and your muscles run off the blood glucose levels.

Menus for Healthy Living

First and foremost remember that 2/3 of your diet must come from carbohydrates or you will have no energy. It takes 40- 54 hours to turn protein into usable muscle fuels. If you don't have enough carbs

in your diet you run out of gas all the time, are chronically fatigued and cannot compete at an optimal level.

Carbohydrates

A carb is a carb right? Oh yeah, there are simple carbs and complex carbs and that's about it, right? Nope, it's a little more involved than that. There is this little something called the glycemic index. The glycemic index is "a relative measure of the extent to which blood glucose increases after ingesting a food containing 50 g of carbohydrates."

Cutting to the chase here is what the glycemic index is and what it tells you. The glycemic index tells you how fast the carbs are released into your blood stream as blood glucose (blood sugars). A food with a high glycemic index will cause a rapid spike in your blood sugar levels. Now the glycemic index is completely different and not tied in any way to whether the carb is simple or complex. For example, honey and a baked potato. Most people recognize the honey as a simple carb and the potato as a complex carb. The honey has a rating of 126 on the glycemic index while the baked potato has a rating of 135 on the glycemic index. A higher number indicates that food causes a more rapid increase in blood sugar levels. Both foods would cause a very rapid increase in blood sugar levels. Another example, fructose and soybeans. Fructose is rated at 30 while soybeans at 20 -both low glycemic index foods, both would cause a very slow and gradual increase in blood sugar levels.

What's the use of all this? Well the body controls the blood sugar levels by releasing insulin into the blood stream. Higher level of blood sugar cause more insulin to be released in order to bring the levels back to normal ranges. So if someone ate honey or a baked potato (plain, nothing on it), their blood sugar levels would rapidly increase and the body would respond by releasing insulin into the blood stream to get the sugar levels back down to normal. On the other hand if they ate fructose or soybeans, the blood sugar would raise gradually and be cleared from the blood stream without causing a huge spike in the blood sugar levels AND without causing a release of insulin to control the blood sugar levels.

In order to see how the glycemic index is useful we have to understand one of insulin's role in the body. Insulin will regulate the blood sugar levels to maintain them within a certain range. Let's say we eat that honey and get the blood glucose spike which release a bunch of insulin, how does the insulin get rid of the excess blood sugar? Insulin "pushes" the blood sugars out of the blood stream into the bodies natural storage facilities.

These are the muscle glycogen stores, the liver glycogen stores, and lastly fat. If we've been sitting around all day doing nothing and we eat a big glob of honey, where does that blood glucose get stored? We haven't been doing much so the muscle glycogen is pretty full - but insulin will top it off for us. Ok, we've still got a lot left, where else can we put it. Let's check the liver, it's almost full, but we can put a little bit more in there - ok, it's topped off. All the good

places to store that blood sugar is gone now, filled up. But there is one place left that NEVER fills up, it's the adipose tissue - fat. This is a storage facility that is pretty much bottomless. So insulin "pushes" the rest of the blood glucose into the fat tissue (it's convert to fat) and now you've got a little bit more fat on your body.

Let's change that now, say we ate the soybeans or fructose. The blood sugar levels rise slowly and stay at a more constant level, so we really don't get an insulin surge like we did before. As we are sitting there doing things, like clicking the remote control while channel surfing, looking around the room, we use up a little bit of our glycogen stores - so the body replenishes them with the blood glucose floating around. The big thing is we didn't get that insulin spike that pushed the blood glucose into our fat reserves.

Knowing this can be used to our advantage too. After you workout your muscle and liver are going to be fairly depleted of their glycogen reserves. This is the time when we can use the insulin to our advantage. By taking in a high glycemic index carb we will raise the blood sugar levels rapidly, causing an insulin surge to occur, which will help to push the blood glucose into the reserves of the muscle and liver, replenishing what was lost during exercise. If you have trained intensely enough, none of the carbs taken in at this time will be turned to fat. The reserves will be so depleted that all the glucose will be stored in the muscles and liver.

Now that you know a little bit about the glycemic index, where do you find out the GI for different foods? I could list them here, but that'd get a little long. A search on the internet will turn up websites that have lists. One word of caution though, I know of at least two different "standards" for the GI. One index has been standardized on glucose as being 100 points while the other has been standardized as white bread being 100 points. So don't compare items on one list to another list unless you know that they are standardized the same.

One last thing about the glycemic index. Eating proteins and fat with a high-GI carb will lower the overall GI of the meal. You can still eat high-GI food, just make sure it's along with proteins and fat.

Now this is a very simplistic explanation of what's going on. But it's a general guideline and hopefully will give you some insight into what the body does when we eat certain foods.

The simplest way to accomplish power back diet is to simply fill your plate with 2/3 carbohydrates and 1/3 protein and fat.

Top Carbs: baked potato, rice, bread, rolls, pasta, bagels, etc.

Want to know exactly what to eat? The following menus each contain between 1,500 and 1,800 calories and are designed around food-group servings from USDA's Food Pyramid. Use these menus as a guide to developing your own menus, substituting equivalent amounts of your

favorite foods from within the same food group whenever you like. Vegetarians can easily substitute such meat and dairy alternatives as tofu and beans for protein, and calcium-fortified soy milk and soy milk products for the dairy category. Loads of training will require intakes 2-3X greater than this during intense patterns in order to have enough energy.

Many athletes simply do not know what foods payout big energy so they buy foodstuffs that are of little nutritional value for an athlete. In order for athletes to realize what foods and dietary options are necessary for proper nutrition here are some suggestions:

These examples also give the food buyer a better variety of foods that pay big energy dividends...

MENU 1 Breakfast

1/2 cup orange juice (1 Fruit)

1 cup cooked oatmeal (2 Grain)

1 cup low-fat milk (1 Milk)

Lunch

3 slices (3 ounces) turkey breast (1 Meat)

2 slices whole-grain bread (2 Grain)

Fresh spinach leaves and tomato slices (1 Vegetable)

1 tablespoon reduced-fat mayonnaise (1 Fat)

1 apple (1 Fruit)

Afternoon Snack

1/2 cup tomato juice (1 Vegetable)

2 large rice cakes (1 Grain)

Dinner

1 cup black bean soup(1 Meat Alternative)

1 corn tortilla, toasted (1 Grain) and topped with 1 cup chopped cooked vegetables (2 Vegetable)

1/2 cup shredded reduced-fat Jack cheese (1 Dairy)

3 fresh pineapple rings (1 Fruit)

Snack

1 cup sugar-free, fat-free lemon yogurt (1 Dairy)

MENU 2

Breakfast

1 cup cantaloupe or Persian melon cubes (1 Fruit)

1/2 cup bran flakes cereal (1 Grain)

1 cup low-fat milk (1 Milk)

Lunch

1 cup lentil soup (1 Meat alternative)

1 cup raw spinach (Vegetable)

1 cup sliced mushrooms (Vegetable)

1 tablespoon reduced-fat salad dressing (1 Fat)

2 large or 4 small bread sticks (2 Grains)

1/2 cup unsweetened applesauce (1 Fruit)

Snack

1 cup grapes (1 Fruit)

1 slice (3/4 ounce) reduced-fat cheese (1/2 Milk product)

Dinner

1 large flounder fillet (1 Meat) broiled with 1 teaspoon olive oil (1 Fat)

1 cup steamed broccoli spears (1 Vegetable)

1/2 small baked potato (2 Vegetable) topped with 1/2 cup nonfat plain yogurt (1/2 Milk product)

1/2 cup fruit salad (1 Fruit)

Snack

3 graham cracker rectangles or 6 squares (1 Grain)

1 cup low-fat milk (1 Milk)

MENU 3

Breakfast

1/2 grapefruit (1 Fruit)

1 slice whole-grain toast (1 Grain)

1 tablespoon reduced-calorie margarine or butter (1 Fat)

2 eggs, scrambled in nonstick skillet without fat (1 Meat)

1 cup low-fat milk (1 Milk)

Lunch

Pasta Salad: 1 cup cooked pasta (2 Grain) with 1 ounce reduced-fat cheese cubes (1 Milk)

1/2 cup chopped cooked vegetables (1 Vegetable)

2 tablespoons low-fat salad dressing (2 Fat)

1 cup melon chunks (1 Fruit)

Snack

4 pretzel rods (1 Bread)

1/2 cup vegetable or tomato juice (1 Vegetable)

Dinner

3 ounces lean steak (1 Meat), sliced and wrapped in 2 fat-free flour tortillas (2 Grain) with 1/2 cup diced tomato (1 Vegetable)

1 cup raw spinach leaves (1 Vegetable)

1/2 cup red or sweet white onion slices (1 Vegetable)

1 kiwi, peeled and sliced (1 Fruit)

Snack

2 cups air-popped popcorn (1 Grain)

MENU 4

Breakfast

3 small pancakes (3 Grain) with 2 tablespoons reduced-calorie syrup (Free) and 1 cup blueberries (1 Fruit)

1 cup low-fat milk (1 Milk)

Lunch

Tuna Salad Sandwich: 2 slices whole-grain bread (2 Grain) 3 ounces water-packed tuna (1 Meat)

1 tablespoon reduced-fat mayonnaise (1 Fat)

Chopped, celery, lettuce leaves (Free)

1 pear (1 Fruit)

Snack

2 large cinnamon rice cakes (1 Grain) with 1/2 cup unsweetened applesauce (1 Fruit)

Dinner

1/2 chicken breast (1 Meat), baked or broiled, skin removed

1/2 cup cooked brown rice (1 Grain)

1 cup steamed zucchini and carrots (2 Vegetables)

1 small roll (1 Grain)

1 tablespoon reduced calorie margarine or butter (1 Fat)

Snack

1 cup fat-free, sugar-free hot cocoa, made with low-fat milk (1 Milk)

3 fat-free cookies (1 Grain)

MENU 5

Breakfast

1 large bagel (2 Grain), toasted with 1 ounce reduced-fat soft cheese (1 Milk)

1 cup strawberries (1 Fruit)

Lunch

1 cup split pea soup (1 Meat Alternative)

1 whole wheat pita pocket (2 Grain) filled with Shredded lettuce (Free)

1 ounce reduced-fat feta cheese (1 Milk)

1/2 cup chopped tomato (1 Vegetable) 1 tablespoon reduced-fat vinaigrette dressing (1 Fat)

Snack

1 peach or 1/2 cup canned peaches packed in unsweetened juice (1 Fruit)

2 gingersnaps (1 Grain)

Dinner

3 ounces lean pork (1 Meat), stir-fried with 1/2 cup sweet red pepper, 1/2 cup onion and 1/2 cup sliced mushrooms (2 Vegetables) in 2 teaspoons vegetable oil (2 Fat)

1/2 cup cooked brown rice (1 Grain)

1 cup fresh pineapple cubes or 1/2 cup canned pineapple packed in unsweetened juice (1 Fruit)

Snack

1/2 cup low-fat frozen yogurt (1 Milk)

APPENDIX A Sample Menus and Snacks: 2,000 Calories

*****Remember heavy training loads and patterns necessitate 2-3x this caloric intake.*****

Breakfast

Blender Drink

Banana, 1..... 100

Milk, 1 cup 2%..... 120

Peanut Butter, 1t..... 95

Toast, 1 slice..... 70

Jam, 1t..... 15
Calories..... 400

Lunch

Hamburger on Bun

Bun..... 120
Grnd. Beef, 2 oz..... 120
Catsup, 1T..... 20
French Fries..... 220
Milk, 1 cup 2%..... 120
Oatmeal Raisin Cookies(2)
(2 1/2" diameter)..... 120
Calories..... 760

Dinner

Roast Pork, 3 oz..... 220
Baked Potato..... 100
Broccoli, 1 stalk 20
Margarine, 2t..... 70
Bread, 1 slice..... 70
Sliced peaches, 1 cup..... 130
Milk, 1 cup 2%..... 120
Calories..... 730

Snack

Lo-cal Pudding, 1 cup..... 130
Total Calories..... 2020

Breakfast

Grapefruit Juice, 6 oz..... 75
Unsweetened Cereal,
1 cup..... 110
Banana, 1 medium..... 100
Milk, 1 cup 2%..... 120
Toast, 1 slice..... 70
Margarine, 1t..... 35
Jam, 1t..... 15
Calories..... 525

Lunch

Chicken Salad Sandwich

Bread, 2 slices..... 140
Chicken Breast, 2 oz..... 120
Lo Cal Dressing, 1T..... 30
Milk, 1 cup 2%..... 120
Apple, 1 medium..... 80
Calories..... 490

Dinner

Chili, 2 cups..... 600

Saltine Crackers, 12..... 160
Milk, 1 cup 2%..... 120
Carrot and Celery Sticks..... 10
Calories..... 890

Snack

Orange, 1 medium..... 80
Total Calories..... 2025

Breakfast

Apple Juice, 6 oz..... 90
Oatmeal, 1 cup..... 145
Raisins, 1T..... 30
Milk, 1 cup 2%..... 120
Toast, 1 slice..... 70
Margarine..... 35
Calories..... 490

Lunch

"Sloppy Joe"

Hamburger Filling, 2 oz..... 200
Bun..... 140
Carrot and Celery Sticks..... 10

Milk, 1 cup 2%..... 120

Chocolate Chip Cookie

1 small..... 50
Calories..... 520

Dinner

Turkey Tacos

Taco Shells, 3..... 210
Picante Sauce, 2 oz..... 30
American Cheese,
4 oz. shredded..... 220
Ground Turkey, 4 oz..... 310
Lettuce, Onion,
Tomato, etc..... 10
Milk, 1 cup 2%..... 120
Calories..... 900

Snack

Orange, 1 medium..... 80
Total Calories.....1990

Breakfast

Orange Juice 6 oz. 80
English Muffin 140
Peanut Butter, 1T 90
Banana, 1 medium 100
Milk, 1 cup 2% 120

Calories 530

Lunch

Cheese Pizza, 2 slices..... 400

Milk, 1 cup 2%..... 120

Apple, 1 medium..... 80

Calories 600

Dinner

Chicken and Noodles,

1 cup..... 300

cooked carrots, 1/2 cup..... 25

Lettuce Salad..... 10

Dressing, 1T..... 60

Milk, 1 cup 2%..... 120

Calories..... 515

Snack

Milk, 1 cup 2% 120

Fig Bars, 5 250

Calories 370

Total Calories 2015

Breakfast

French Toast,

2 slices..... 300
 Syrup, 2 oz..... 200
 Strawberries, 4 oz.,
 unsweetened..... 25
 Milk, 1 cup 2%.....120
 Calories..... 645

Lunch

Turkey Sandwich

Bread, 2 slices..... 140
 Turkey Breast, 3 oz..... 105
 Lettuce, Tomato slices..... 5
 Lo-cal Mayonnaise, 1T..... 30
 Milk, 1 cup 2%..... 120
 Calories..... 400

Dinner

Beef Stew, 2 cups..... 400
 Dinner Roll, 1..... 70
 Margarine, 1t..... 35
 Applesauce, 4 oz..... 55
 Milk, 1 cup 2%..... 120

Lo-cal Pudding, 1 cup..... 130
 Vanilla wafers, 6..... 100

Calories..... 910

Snack

Popcorn, 2 cups, no butter..... 60

Diet Soda, 12 oz..... 0

Calories..... 60

Total Calories..... 2015

Breakfast

Cantaloupe, 1/4 60

Egg, poached 75

Toast, 2 slices 140

Margarine, 1t 35

Jam, 2t 30

Milk, 1 cup 2% 120

Calories 460

Lunch

Tuna Pocket

Pita Bread, 1..... 120

Tuna, 3 oz..... 100

Lo-cal Mayonnaise, 2T.. 60

Lettuce, tomato slices... 5

Pretzels, 1 oz..... 110

Milk, 1 cup 2%..... 120

Calories..... 515

Dinner

Broiled Turkey Breast,

3 oz..... 130

Wild Rice Pilaf, 1 cup..... 270

Spinach Salad..... 15

Dressing, 1T..... 60

Angel Food Cake, 1 slice..... 125

Chocolate Syrup, 2T..... 75

Milk, 1 cup 2%..... 120

Calories..... 795

Snack

Pineapple, 1 cup..... 150

Graham Crackers, 3 squares..... 80

Calories..... 23

Total Calories 2000

LOADING

Prior to a major competition the diet may increase to deliver a larger store of energy over time, ex. A tournament or series of races like trials and finals. Below is an example of such:

Example of 3-day carbohydrate loading for an endurance athlete.

DAY 1

Breakfast

Cereal, 1½ cups

Milk, low fat, 1 cup

Orange Juice, 1 cup

Roll/Toast, 1 roll / 2 pieces of toast

Jam & Preserves, 1 tbsp

Morning Snack

Sport Drink/Lemonade, 2 cups

Sport Bar, 1
Banana, 1 med

Lunch

2 Sandwiches:
Roll/bread, 2 roll / 4 slices of bread
Lean meat, 2 oz (60 g)
Cheese, 1 oz (30 g)
Vegetables, 2 cups
Fruit Juice, 100%, 1 cup
Afternoon Snack
Sport Drink/Lemonade, 2 cups
Apple, 1 large
Bread, 2 slices
Jam or preserves, 1 tbsp

Dinner

Vegetables, 2 cups
Olive oil, 1 tbsp
Soy Sauce, 2 tbsp
Chicken breast, baked, 3 oz (85 g)
Rice, cooked, 1½ cups
Yogurt, fruit and low fat, 1 cup
Fruit Juice, 100%, 1 cup

Nutrition Facts:

Calories	Protein	Carbs	* Fat	Calcium	Iron	Fiber
3000	116 g	554 g	47g	1395 mg	34 mg	45 g

Day 2

Breakfast

Low fat granola, _ cup
Yogurt, fruit and low fat, 1 cup
Raisins, ¼ cup
Roll/ Toast, 1 roll/ 2 pieces of toast
Jam and preserves, 1 tbsp

Morning snack

Sports drink/lemonade, 2 cups
Trail mix, ½ cup
Peach, 1 med

Lunch

Minestrone soup, 1 cup
Crackers, ½ cup
Spaghetti, cooked 2 cups
Tomato sauce, ½ cup
Parmesan cheese, 1 tbsp
Fruit Juice, 100%, 1 cup
Afternoon snack
Sport drink/lemonade, 2 cups
Banana, 1 med
Sport bar, 1

Dinner

Salmon filet, 3 oz (85g)
Potato, baked or mashed, 1 cup
Olive oil, 1 tbsp
Steamed vegetables, 2 cups
Frozen yogurt, 1 cup

Nutrition Facts:

Calories	Protein	Carbs *	Fat	Calcium	Iron	Fiber
3240	104	573	69	997	23	44

Day 3

Breakfast

Omelet:
Egg whites, 2
Vegetables, 1 cup
Roll/ toast, 1 roll/ 2 pieces of toast
Jam and preserves, 1tbsp
Orange, 1 med

Morning snack

Sports drink/lemonade, 2 cups
Sports bar, 1
Pear, 1 large

Lunch

Grilled turkey breast sandwich:
Deli turkey, 2 oz (60g)
1 roll/ 2 pieces of bread
Olive oil, 1 tbsp
Pesto pasta with tomatoes, 1½ cups
Fruit Juice, 100%, 1 cup

Afternoon snack

Sport drink/ lemonade, 2 cups
Pretzels, 10 small
Unsweetened applesauce, 1 cup

Dinner

Stir-fry vegetables, 1 cup
Risotto, 2 cups cooked
Shrimp, fish, or chicken 3 oz (85 g)
Olive oil, 1 tbsp
Fruit yogurt low fat, 1 cup
Berries, 1 cup

Nutrition Facts:

Calories	Protein	Carbs*	Fat	Calcium	Iron	Fiber
3360	112	573	74	1365	22	40

Travel Menus and Guides

When you travel diet changes from home diet. This list can help guide you to some valid dietary choices:

Look for:

Breakfast Buffet Style

A variety of breakfast options need to be provided, including juices, fruits, cereals and hot food options. Examples are:

Cereals

- Cold cereals: wholegrain cereals, bircher muesli
- Hot cereals : porridge and oatmeal (with dried fruit, brown sugar, cinnamon)

Dairy

- Milk and soymilk (whole, low fat, and skim)
- Natural, plain and fruit yogurt (whole and low fat)
- Low fat cottage cheese (plain or with fresh fruit)

Breads

- White and whole-grain toast, English muffins, bagels

Other hot items:

- Pancakes, waffles (made with white and whole grain flour, added oats, raisings, fruit)
- Eggs (poached, hard boiled or scrambled eggs)

Spreads

- Butter or margarine
- Honey, jam
- Peanut butter

Fruit

- Fresh fruit pieces or fruit salad
- Compote and stewed fruit
- Dried fruit and nuts
- Juices (orange, apple and other)

Drinks

- Coffee, tea (herbal and black), hot chocolate, milk.

Lunch - Buffet Style

Both hot and cold food options need to be available. Suggestions include:

Sandwiches

- A variety of white and whole grain rolls or breads with butter and margarine on the side
- Cold cuts (lean ham, tuna/salmon in brine, lean chicken, roast beef, cheese)
- Salads (variety of lettuce, spinach, tomatoes, cucumbers, carrots, peppers, onions etc.)
- Condiments (mustard, chutney, preserves, honey, margarine, low fat mayonnaise)

Hot dishes

- Soup (minestrone, vegetable)
- Pasta and noodles (pasta with tomato based sauces, Chinese or Japanese noodles with soy)

sauce; lean protein sources such as turkey, chicken, fish, lean beef)
- Rice based dishes (risotto, fried rice, pilaf, Spanish rice; lean protein sources such as turkey, chicken, fish, lean beef)
- Corn meal (polenta)
- Home made pizza
- Tortilla based dishes (chicken burrito, fish tacos, wraps)

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- Baked potato (with variety of toppings)

Dessert

- Fresh fruit or fruit salad
- Low fat muffins or fruit and vegetable cakes (banana bread, carrot cake)
- Yogurt and custard
- Trail mix (nuts and dried fruit mix)
- Italian yogurt ice cream ($\frac{1}{2}$ plain yogurt + $\frac{1}{2}$ vanilla ice cream)

Drinks

- Water, juice, tea (herbal), hot chocolate or coffee

Dinner

In the evening most skiers need to consume a large hot meal. Please ensure that minimal oil is used and lean meat and low fat dairy products are utilized. A variety of options are stated below:

Main Course

- Soup
- Vegetarian and/or meat pasta
- Stir-fry dishes with rice or couscous
- Sweet and sour chicken/beef and rice
- Grilled fish, skinless chicken breast, lean steak with potatoes
- Risotto, pilaf, or fried rice with chicken, fish, or steak
- Asian noodles with meat and vegetables
- Vegetarian or meat-based curry with rice
- Vegetarian and meat-based Mexican food
- Serve with plenty of bread rolls and salads (dressing served on the side; use olive oil)

Dessert:

- Fruit crumble, pies, cakes
- Rice pudding or milk rice
- Bread and custard pudding
- Fruit salad or fresh fruit bowl
- Serve with low fat ice cream, yogurt, or custard

Drinks:

- Water, juice, tea (herbal), coffee

PRINCIPLES OF GOOD NUTRITION

In all aspects of nutrition realize that extremes are difficult for your system to deal with. Try moderation and to establish a regular nutritional process that your body functions on.

If you want to be a successful athlete, you have to eat sensibly (junk food is out) and work your tail off at practice. I mean conditioning

that goes far beyond any other lifestyle. That's how great champions are made in sport!

Four Food Groups

Athletes can achieve a balanced diet by eating foods from the four basic food groups. The training table guidelines listed below indicate the minimum number of servings from each food group for each day. The menus in Appendix A are consistent with these recommendations.

Meat Group: This group includes high protein foods: meats, poultry, fish, eggs, legumes (such as dry beans and lentils), and nuts. Choose lean meats, fish, and poultry (without skin) to help keep your fat intake low. Remember to keep portion sizes moderate.

Dairy Group: This group is rich in protein, calcium, and other nutrients needed for healthy bones and muscles. Choose products labeled "low-fat" or "non-fat" to get the full nutritional value without the extra fat calories found in whole milk products.

Fruit/Vegetable Group: This group includes all fresh, frozen, canned, and dried fruits and vegetables and juices. This food group is loaded with vitamins and minerals and fiber. Foods in this group are mostly composed of carbohydrates.

Grain Group: This group is the main source of complex carbohydrates and fiber. It includes grains such as oats, rice, and wheat, and the breads, cereals, noodles, and pasta made from them.

TRAINING TABLE GUIDELINES

Group	Minimum Serving Sizes
Meat	2-4oz.
Cooked meat	5-7 oz/day
Milk	1 cup
Fruit/Vegetable	1/2 cup cooked 1 cup raw 1 med. size piece fruit 1/2 cup juice
Grain	1 slice bread 1 cup cereal 1/2 cup pasta

CALORIES

A "calorie" is a unit used to describe the energy content of foods. Your body requires energy, and the food you eat supplies that energy. When you take in more food calories than you use, those extra calories are stored as fat, and you gain weight. Weight loss occurs when you

consume fewer calories than you use. This causes your body to utilize its stored fat for energy, and you lose weight as a result. Losing weight gradually helps assure that mostly fat will be lost. Losing weight too quickly will cause you to lose muscle and water in addition to fat, sapping your strength and endurance in the process. Gradual weight loss is best accomplished by combining your training with a *slight reduction* in food intake. Remember, your body requires a certain amount of energy and nutrients just to keep you alive and healthy.

For this reason, *your caloric Intake should not fall below 1,700-2,000 calories per day.* In planning your diet, it will be helpful to estimate how many calories you need each day. Caloric needs differ from athlete to athlete depending upon body size and activity level. Appendix A contains examples of 2,000 calorie menus to help you plan your diet. Appendix B can help you plan to eat wisely at fast-food restaurants.

Fat

No fat... No Hormones to train...

Everyone needs a little fat in their diets, and athletes are no exception. Many of your hormones that you need to train and recover come from fat sources. Fat should make up about 20-30% of the calories you consume.

Most of the fat we consume is naturally found in foods (meats, nuts, and dairy products) or added during the preparation of food (e.g. fried foods). Sources of additional fat include margarine, peanut butter, and salad dressings. Hormones come from fat. No fat... No hormones to train.

Fat is also a valuable fuel source, when your glycogen(stored muscle fuels) are used up.

Protein

Protein is used for growth and repair of all the cells in your body. It also determines how much muscle mass you can maintain. Often over the course of a long season, we see muscle wasting meaning an athlete gets thinner and thinner and may not realize that as you lose mass you lose structural power and strength. As you thin out you are weaker and weaker. Good sources of protein are meat, fish, and poultry. Many plant foods, like beans and nuts, are good protein sources too. However, nuts are also high in fat and so should be eaten only in small quantities. Your diet should provide 12-15% of its calories as protein. The typical American diet provides more than enough protein, so you don't need to worry too much about your protein intake.

The Importance of Protein in the Optimum Eating Plan for the Athlete

Practice, workout, compete. Practice, workout, compete. Practice, workout, compete. For the competitive athlete, this may be the typical scenario during the season. Include a long school day, attention to homework, and less than perfect sleep habits, and you

have a potential disaster on your hands. Although such activity levels are necessary in the quest to become the best you can be, have fun and play to your fullest potential, build mental confidence, and prevent sports-related injuries, this type of schedule can wreak havoc on the body. Especially, if you are not taking the proper steps to rebuild, repair, and recover.

We know that practice, workouts, and games stress the body, physically. Although each of these components is needed to compete successfully, the actions performed during these events, actually, traumatizes the body. At the molecular level, muscle tissue is broken down, pulled, strained, and frayed. The joints and connective tissue around them are bruised, inflamed, and swollen. Blood plasma is 'thinned-out' and vital organs, like the heart, kidney, and lungs, along with various systems such as the respiratory, hormonal, and central nervous system, are stressed to the max. The result is anything, but optimum performance conditions.

Although these practices, workouts, and games are physically traumatizing to the body, they are needed in order to acquire the skills needed to compete successfully, improve physical capacities, and are, just plain, fun. When performed correctly and at the right intensities, they send signals to the body to rebuild itself. Not, simply, to the state it was prior to the event. You see, the body is not a machine that just takes 'wear and tear', slowly breaking down over the years. The body is a smart organism that, when sent the right signals (progressive workouts / gameplay) and given the right recovery tools (rest and proper nutrition), can rebuild itself to a state better than before such activities. Think of the practices, workouts, and games as the catalyst for making the body faster, bigger, and stronger. When proper recovery strategies are taken, these stresses are rewarded, positively. However, if the body does not have the right nutrients available for repair, the stresses of the practices, workouts, and games becomes a negative situation for the body. Repeated trauma and less than optimum recovery tactics manifest themselves as overtraining; the body cannot rebuild and repair itself. To the contrary, it starts to breakdown, performance declines, and susceptibility to injury increases.

Adequate protein intake is vital to the rebuilding and recovery process. Protein delivers all of the raw ingredients needed by the body for repair. Various protein sources are made up of different amino acids. These amino acids are the molecular building blocks of our body. When proteins are digested, our bodies break them down into amino acids that the body can use to rebuild itself as needed. As you can see, protein is critical in the rebuilding and recovery processes of the body. Inadequate intake of protein, inferior protein sources, and inadequate intake of other nutrients, such as carbohydrates, which leads to the use of protein as fuel instead of repair, will lead to a state of overtraining and degeneration; anything but, optimal performance conditions.

Although it would be wise to read as many food labels as possible, purchase a book that details nutritional breakdowns of food, and

educate yourself, as much as possible, in the science of nutrition, we have been able to reduce eating strategies, down, into an easy to understand form. The Optimum Eating Plan for Athletes simplifies nutritional goals and presents them in a way that is easy to implement, immediately.

Nutritional Goal #1: Include a quality source of protein with each meal and mini-meal or snack. Every, three to five hours.

Key Phrase:

Translation:

1st Choice Proteins

Eggs / Egg Whites
Low-Fat Cottage Cheese
Fish
Protein Powders

2nd Choice Proteins

Turkey
Chicken
Duck

3rd Choice Proteins

Lean Beef
Lean Pork
Lamb

Be consistent with your nutritional goals. Include a quality protein source, regularly. Missing a protein source at one meal is not going to doom your efforts. Likewise, consuming a quality protein, once, is not going to make a significant impact on your development. Consistency is crucial.

Quality sources of protein can easily be chosen by remembering our key phrase. You don't need to memorize endless food lists or count and measure everything you eat. Select a protein about the size of the palm of your hand and include it at each meal or mini-meal / snack.

Although, quite simplified, we find our athletes are able to interpret and understand the material, well, and are able to comprehend and make wise food choices, immediately. Two, of the key components, needed to successfully modify your food intake, favorably

Vitamins and Minerals

If you eat a balanced diet from the four basic food groups, you will consume all the vitamins and minerals your body needs. Including ample portions of fresh fruits and vegetables in your diet will help ensure an adequate intake of vitamins and minerals. Vitamin and mineral supplements are usually unnecessary, but if you like to have the added "insurance" of taking a supplement, choose a vitamin and mineral

supplement that does not exceed 100% of the Recommended Daily Allowance (RDA) for each nutrient.

Zinc is critical in sweat loss sports. Low zinc levels have the same symptoms as Chronic fatigue syndrome.

B vitamins are your recovery vitamins. They are so critical for an athlete to train and compete at a high level you should take B vitamins supplements.

Iron if you don't have it you are doomed. It is responsible for the oxygen dynamics in human muscle. One iron pill (ferrous sulfate or gluconate) one time per week is critical. Always take with vitamin C or O.J. at night is best then go to bed... never with Calcium or dairy products. (Prevents it from binding to blood cells) Remember more is not better with iron.

Eating Before Training or Competition

When you eat can often be as important as *what* you eat before competition and between matches in a tournament. When you eat a regular meal, it takes about three hours for the food to be completely digested and absorbed. As a result, meals are best eaten three to four hours before competition. For athletes too nervous to consume solid foods before competition, special sports nutrition supplements may be an option. Carbohydrate supplements and liquid-nutrition supplements can be taken up to one hour before training or competition, but you should experiment with such products to make certain that you do not experience discomfort. A properly-formulated sports drink can be consumed before, during, and following training or competition to help minimize dehydration and provide a source of energy to working muscles.

In Between Rounds/Games

As soon as you finish a competition you should take in some glucose (from Gatorade or Powerade watered down) At least 10 ounces and some simple carbs. ex. Powerbar or fruit. Ex. Raisins Banana. This needs to be done asap. Within minutes.

Nutritional Preparation for Tournaments and Multiple Heat Competitions

Preparing for a single event is challenging enough, but what should you do if you have to compete in a series of events? Many sporting competitions involve multiple games or a series of heats and finals in the same day, or over consecutive days. To further complicate matters, in some situations the exact start time of an event may not be known (e.g. tennis tournament) making planning even more difficult. whatever the scenario, meeting your nutritional needs to compete at your best means you need to consider a number of key factors.

When it comes to tournaments expect the unexpected. Don't just plan for what you hope will happen, plan for the worst-case scenario. For example, in tennis the match could

go for a shorter or longer duration than expected due to a player injury, rain delays or a close game that goes to an extra set. For a successful competition, planning is important but flexibility is required. If you only have limited strategies, meal times or a restricted eating pattern then there is a good chance you will be caught out.

Challenges with food timing

General advice for eating before exercise is to have a carbohydrate-rich meal or snack 2-4 hours before exercise. However, in a tournament situation this may not always be practical. The breaks between events may not be long enough for a meal or large snack to be digested. Instead a better strategy might be to have a planned "graze" throughout the day on lots of small nutritious snack foods. Individual tolerance varies however, use the following as a guide:

Time Before Exercise	Suggested Food Choices
3-4 hours	Toast Bread with jam or honey + Sport drink baked potato + cheese filling + Fruit Juice Honey on toast breakfast cereal with milk bread roll with banana fruit salad with fruit-flavored yoghurt pasta or rice with a sauce based on low-fat ingredients (e.g. tomato, vegetables, lean meat)
1-2 hours	Liquid meal supplement milk shake or fruit smoothie sports bars (check labels for carbohydrate and protein content) breakfast cereal with milk cereal bars fruit-flavored yogurt fruit
Less than 1 hour*	sports drink carbohydrate gel cordial sports bars raisins

* NB. A small number of people experience an extreme reaction following the intake of carbohydrate in the hour prior to exercise. In addition to these guidelines, you should consider:

- the time of day you will be competing (and don't forget to include warm up time!)
- whether foods you would normally eat at those times of the day are going to be appropriate - e.g. can you keep a yoghurt cold until mid-morning?
- whether foods normally used at particular times of the day could be used as part of your tournament plan - e.g. breakfast cereals make handy snacks

Snacking throughout the day may not satisfy your appetite as well as your usual meal plan. To avoid being hungry, plan for a larger snack or small meal at a strategic time, such as the longest expected break. Practice your competition eating strategies in training so that you can be confident of avoiding stomach upsets on the day.

Challenges with food availability

You've worked out when you are going to eat, but what are you going to choose? Typically sporting venues provide a limited selection of foods and fluids, many not conducive to athlete diet or nutrition. Try to find out in advance, what will be on offer to avoid any voids on the competition day. The safest option is to take your own food supplies. Consider food freshness, refrigeration needs and perishability. Foods that are generally consumed cold or cooled should be kept this way. Some foods

such as low-fat yogurts may be able to be kept cold for a few hours but should be consumed early in the day. Fragile food such as sandwiches and fruit should be kept cool and in a protective container – no one likes a warm, soggy sandwich or a squashed banana! Robust food options that can be stored at environmental temperature include dry biscuits, rice cakes, canned fruit, dried fruit, cereal bars, sports bars, fruit buns/scrolls, scones and sport bars and gels. Cup-a-soups are a good option if you have access to boiled / hot water.

It's always a good idea to pack a variety of foods and always pack a bit extra. You may change your mind about what you want or you may need to eat more than you expect. However, avoid eating everything in your bag, just because it is there. You can always take your surplus supplies home at the end of the day.

Flavor fatigue

Your exercising muscles aren't the only things that get tired. Your taste buds can get tired as well! Many suitable carbohydrate-rich foods are sweet tasting, however over a long day of competing "flavor fatigue" can set in. Salty foods often become more appealing. Many salty foods are higher increase our thirst. This may encourage fluid intake and increase fluid absorption and fluid retention. Excess water table weight can impede performance. Therefore, plan to include some salty foods in your tournament eating pattern but not too much. Options include sandwiches or peanut butter, dried biscuits, soup, low-fat 2 minute noodles.

Challenges meeting high energy requirements

Supplements such as sports bars and liquid meal supplements should be considered if you expect to have particularly high-energy requirements, limited time to refuel or if you tend to suffer from stomach upset during competition. Liquid meal supplements empty quickly from your gut, decreasing the likelihood of stomach upset. They also provide valuable nutrients such as carbohydrate and protein for refueling and recovery between events.

If you have high-energy requirements you may also consider high-sugar carbohydrate options such as jam and honey as spreads, jelly beans, dried fruit ex. pineapple and raisins. These will provide additional energy in the form of carbohydrate.

Challenges with hydration

You've now thought about the foods you are going to eat and when, but don't forget the vital ingredient – fluid! Preventing dehydration is a key to sustained performance, especially when competing for long periods and in multiple events over one or many days.

Tips for maintaining hydration in tournament situations include:

- Start exercise well hydrated.
- Drink plenty of fluids from the time you wake up and keep drinking to a plan all day. Steady drinking throughout the day/night will have you better prepared than drinking large amounts of fluid irregularly. Sip, Sip, Sip...
- Include carbohydrate-rich beverages such as sports drinks to continually top up carbohydrate stores and maintain fluid balance.
- "Still" beverages (e.g. sports drinks, cordial, water) may be better tolerated than carbonated drinks especially if you are required to compete at short notice.
- Always have drink bottles handy for regular fluid consumption.
- Keep fluids cool with ice (alternatively, freeze drinks the night before allowing them to defrost slowly over the day of competition).

Practical Example

School Swimming Meet

Time	Event	Advice
7:00 am	Breakfast	Cereal + low fat milk + slice of toast with jam
9:00 am	Warm up and race 50 m freestyle heats	Drink at least 1 cup of water in the half hour before race
10:00 am	Break	Fruit smoothie / banana + water or sports drink
11:00 am	Warm up and race 50 m backstroke	
11:30 am	Recovery, warm up and race 50 m freestyle final	Remember fluids - water & sports drink
12:00 noon	Lunch	Power Bar ham sandwich + fruit raisins, pineapple
1:30 pm	Warm up and race 100 m medley	Remember fluids - water & sports drink
3:00 pm	Break	Power Bar or Cereal bar + sports drink
4:00 pm	Warm up and race 4x50 m freestyle relay	Remember fluids between races.
4:30 pm	Recovery, warm up and race 4x50 m medley relay	Don't forget fluid replacement after racing. Sports drinks will help to replenish carbohydrate until you get home for dinner
6:00 pm	Dinner	Chicken + rice /real meal

Summary

Preparing for a competition or tournament involves putting the basics of sports nutrition into practice. Planning ahead will help you have a successful competition and avoid food-related stresses on the day(s) of competition. Don't forget fluids as part of your plan!

Methods Of weight Control That Should be Avoided Dehydration Dehydration reduces every physiological capacity for performance.

Weight loss in wrestlers usually occurs in a short period of time and consists primarily of water loss. If you lose weight faster than 2-3 pounds per week, you are likely losing water (and perhaps muscle tissue). Unfortunately, when you dehydrate after weigh-in, your body absorbs water at a relatively slow rate: only about 2 pints per hour and it takes up to 48 hours for the water balance in your tissues to be restored. The ill effects of dehydration include a decrease in muscular strength and endurance, a decrease in blood flow to muscle

tissues, and an impaired ability to properly regulate your body temperature. Therefore it is recommended that:

- ? wrestlers should limit weight loss by dehydration to a bare minimum.
- ? Use of diuretic drugs ("water pills") to help lose water weight should be avoided. These drugs can cause disorders in the way your heart and kidneys function.
- ? wrestlers should not rely upon sitting in a steam room or sauna to cut weight. Exercise in a plastic suit should also be avoided. These practices are strongly discouraged because they can cause rapid dehydration and heat stroke, which may be fatal

A pre-event meal rich in carbohydrates is best. Plan a meal consisting of high-carbohydrate, either in solid form or in a liquid formula.

	HIGH CARBOHYDRATE PRE-EVENT MENUS	
Non acidic juice banana Toast with butter and jelly/honey Beverage of choice		Non acidic juice Pancakes with syrup Toast w/margarine and jelly Beverage of choice
Peaches	—	
Non acidic juice Spaghetti with meat sauce Italian bread with margarine Fruit cup Beverage of choice	Baked chicken, no skin Baked potatoes fruit Dinner rolls Beverage of choice	Fruit lasagna Roll fruit beverage of choice

Take liquid meals 2 to 3 hours prior to an event. They should be low in fat and high in carbohydrate, with some vitamins and minerals added. Some examples of liquid meals are Nutriment, Sustacal, and Instant Breakfast Gatorade Powerade.

Do not ingest foods and beverages high in sugar within 1 hour of the start of competition. Sugars taken at the start of a match stimulate insulin production and therefore actually cause an accelerated use of glycogen supplies. Take adequate fluids to ensure hydration. Unsweetened beverages may be taken within 15 to 30 minutes of

competition. Glucose and Fructose drinks work best. Use watered down sport drinks ex. 20 ounces of Gatorade with 20 ounces of h₂O same mixture with fruit drinks like Minute Made drinks. Sip don't guzzle.

Supplemental carbohydrate during the event is not necessary for events lasting less than 60 minutes. For longer events or multiple-event, day-long activities, endurance and performance may be improved through carbohydrate consumption during the events. Carbohydrate intake during exercise is a major consideration in ultra-endurance events and long-duration endurance events such as marathons.

Once an appropriate and realistic competition weight has been established and achieved, nutrition emphasis should be on maintaining and stabilizing weight to achieve peak performance. In order to accomplish this, the following guidelines for athletes are recommended:

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- Following the Food Guide Pyramid, choose a training diet that is high in complex carbohydrates (55-60% of total energy), moderate in protein (20%), and low in fat (20-25%).
- Drink to stay hydrated, and replace % of sweat loss (body weight loss) after exercise.
- Before a match, consume a high-carbohydrate, easily digested meal.
- Eat or drink carbohydrates to replenish glycogen after practice or matches.
- Maintain strength and energy by avoiding weight cycling or rapid weight loss.
- Eat small-to-moderate sized meals every 3-4 hours to help maintain steady glucose levels and avoid "crashing." This will help control appetite and reduce binge eating.

what if I exercise early in the morning?

It is not always practical to eat a meal 3-4 hours before exercise. If you train early in the morning you should opt for a light snack about an hour before exercise. For example, some fruit or a cereal bar on the way to training along with some fluid such as sports drink. Make up for your smaller carbohydrate intake by consuming carbohydrate during the event or just after the training session.

what if I am too nervous to eat?

You will perform better when you are well-fuelled and well hydrated, and the pre-event meal may play an important role in achieving these goals. Experiment to find a routine that works and foods that are safe and familiar to you. Liquid meal supplements such as Power Bar Protein Plus powder provide an alternative for anyone who has difficulty tolerating solid foods pre-exercise. You may also find that foods such as cereal bars and sports bars can be eaten if you nibble them slowly over the hours leading up to your competition.

Should I avoid carbohydrate 1 hour before exercise?

Most athletes are able to consume carbohydrate in the hour before exercise without affecting performance, and in some cases it can even improve the outcome of the session. However, a small percentage of athletes experience a drop in blood glucose levels and symptoms such as fatigue, shakiness and dizziness after consuming carbohydrate immediately before exercise. This reaction is a response to the increase in carbohydrate use that occurs after carbohydrate intake, associated with a rise in the levels of the hormone, insulin. When the start of exercise coincides with extra carbohydrate use, it is usual to see a small dip in blood glucose levels. In most people, this is a temporary event which is quickly corrected by the body without any side-effects. However, in a few individuals, the drop in blood glucose is greater, or the individual is sensitive to the change, suffering a pronounced fatigue. If you are affected in this way consider the following advice:

- Experiment to find the best timing for your pre-exercise meal. Try allowing a longer period between eating and exercising.
- If you need to eat close to exercise, opt for a snack that provides at least 70 g of carbohydrate. There is some evidence to suggest that small amounts of carbohydrate (<50 g) are more likely to cause problems in sensitive individuals than larger amounts. This is probably because the small intake of carbohydrate is swamped by the carbohydrate use. Larger intakes will compensate for a greater rate of use, leaving the athlete with a net gain in carbohydrate availability.
- Include some low glycemic index foods (yoghurt, multigrain bread, pasta, oranges) in the pre-exercise meal. These result in a slower release of glucose throughout exercise and a smaller insulin response compared to higher glycemic index foods.
- Include some high-intensity activity in your warm-up. This helps to stimulate glucose release from the liver and prevents blood glucose levels from dropping too low.
- Consume carbohydrate during the event.

Should I avoid eating before exercise if I am trying to lose weight?

Exercising in a fasted state (8 hours since the last meal) results in a greater proportion of fat being used as the exercise fuel compared to doing the same workload after a carbohydrate-containing meal or snack. However, it is possible that you will be able to exercise harder and for a longer period if you consume carbohydrate before exercise. Overall, this will result in greater energy use and a better contribution to the negative energy balance that is needed to cause fat loss. To make a decision about eating before your workout, it is useful to consider the goals of the session. If your primary goal is to improve performance, have something to eat before exercise. If your primary goal is weight loss, and you will do the same amount of exercise regardless of whether you eat or not, save your meal until after the session.

Recovery Nutrition

What are the priorities for recovery nutrition?

Recovery is a challenge for athletes who are undertaking two or more sessions each day, training for prolonged periods, or competing in a program that involves multiple events. Between each work-out, the body needs to adapt to the physiological stress. In the training situation, with correct planning of the workload and the recovery time, adaptation allows the body to become fitter, stronger and faster. In the competition scenario, however, there may be less control over the work-to-recovery ration. A simpler but more realistic goal may be to start all events in the best shape possible. Recovery encompasses a complex range of process that include:

- restoring the muscles and liver with expended fuel
- replacing the fluid and electrolytes lost in sweat
- allowing the immune system to handle the damage and challenges caused by the exercise bout
- manufacturing new muscle protein, red blood cells and other cellular components as part of the repair and adaptation process

The importance of each of these goals varies according to the workout - for example, how much fuel was utilized? Was muscle damage caused? Did the athlete lose much sweat? Was a stimulus presented to increase muscle protein? A proactive recovery means providing the body with all the nutrients it needs, in a speedy and practical manner, to optimize the desired processes following each session. State-of-the-art guidelines for each of the following issues are presented below:

- **Refueling**

The muscle can restore its fuel (glycogen) levels by about 5 per cent per hour, provided that enough carbohydrate is eaten. Depending on the fuel cost of the training schedule and the need to fuel up to race, a serious athlete may need to consume 6-10 g of carbohydrate per kg body weight each day (300-700 g per day). If the time between prolonged training sessions is less than 8 hrs, it makes sense to use all of this period for effective refueling. To kick-start this process an intake of at least 1 g/kg of carbohydrate - 50-100g for most athletes - is needed. This has led to the advice that athletes should consume carbohydrate - either their next meal, or at least a snack - as soon as possible after an exhausting workout, to prepare for the next.

- **Rehydration**

Most athletes finish training or competition sessions with some level of fluid deficit. In hot conditions or after strenuous sessions, fluid losses are usually large and require a focused effort to rehydrate after the workout. In this case, comparing pre- and post-session measurements of body weight can provide an approximation of the overall fluid deficit. Athletes may need to replace 150 per cent of the fluid deficit to get back to baseline - for example, if you are 2 kg lighter (2 litres lighter) at the end of the session, you will need to drink 3 litres of fluid over the next hours to fully replace the existing and ongoing fluid losses.

- **Immune System**

In general, the immune system is suppressed by intensive training, with many parameters being reduced or disturbed during the hours following a work-out. This may place athletes at risk of succumbing to an infectious illness during this time. Many nutrients or dietary factors have been proposed as an aid to the immune system - for example, vitamins C and E, glutamine, zinc and echinacea - but none of these have proved to provide universal protection. The most recent evidence points to carbohydrate as one of the most promising nutritional immune protectors. Consuming carbohydrate during and/or after a prolonged or high-intensity work-out has been shown to reduce the disturbance to immune system markers. Carbohydrate intake may be beneficial for a number of reasons. For example, it reduces the stress hormone response to exercise thus minimising its effect on the immune system. It also supplies glucose to fuel the activity of many of the immune system white cells.

- **Muscle Repair and Building**

Prolonged and high-intensity exercise causes a substantial breakdown of muscle protein. During the recovery phase there is a reduction in catabolic (breakdown) processes and a gradual increase in anabolic (building) processes. Recent research has shown that early intake of essential amino acids from good quality protein foods helps to promote the increase in protein rebuilding. In fact, protein consumed immediately after, or in the case of resistance training work-outs, immediately before the session, is taken up more effectively by the muscle into rebuilding processes, than protein consumed in the hours afterwards. However, the protein needs to be consumed with carbohydrate foods to maximise this effect. Carbohydrate intake stimulates an insulin response, which potentiates the increase in protein uptake and rebuilding.

How does recovery eating fit into the big picture of nutrition goals?

For the athlete who is undertaking two or more training sessions each day, eating for recovery plays a substantial role in the daily food schedule and in total nutrient uptake. Either meals (which generally supply all the nutrients needed for recovery) must be timetabled so that they can be eaten straight after the work-out, or special recovery snacks must be slotted in to cover nutrient needs until the next meal can be eaten. These recovery snacks then need to be counted towards total daily intake.

For athletes who have high-energy needs, these snacks add a useful contribution towards the total day's nutritional and energy needs. When there is a large nutritional budget to play with, it may not matter too much if the snacks only look after the key recovery nutrients - for example carbohydrate - or contain extra kilojoules from fat. On the other hand, for the athlete whose skinfold goals require a careful attitude to dietary intake, recovery snacks may need to be low in fat, and count towards meeting daily needs for vitamins, minerals and other nutrients. Snacks that can supply special needs for calcium, iron or other nutrients may double up as recovery snacks and good overall choices.

What are the practical considerations for recovery eating?

Some athletes finish sessions with a good appetite, so most foods are appealing to eat. On the other hand, a fatigued athlete may only feel like eating something that is compact and easy to chew. When snacks need to be kept or eaten at the training venue itself, foods and drinks that require minimal storage and preparation are useful. At other times, valuable features of recovery foods include being portable and able to travel interstate or overseas without penalties from customs officials, being individually packaged and sealed for the benefit of lengthy nights of drug testing, or being labeled with nutritional information so that the athlete can check how much they need to consume to meet their recovery goals. Situations and challenges in sport change from day to day, and between athletes - so recovery snacks need to be carefully chosen to meet these needs.

The following table provides ideas for snacks providing carbohydrate, as well as carbohydrate-protein combinations.

Carbohydrate-rich recovery snacks (50g CHO portions)

- 700-800ml sports drink
- 2 sports gels
- 500ml fruit juice or soft drink
- 300ml carbohydrate loader drink
- 60-70g packet jelly beans
- 2 slices toast/bread with jam or honey or banana topping
- 1 large chocolate bar (80g)
- 2 cereal bars
- 1 cup thick vegetable soup + large bread roll
- 115g (1 large or 2 small) American muffins, fruit buns or scones
- 300g rice
- 300g (large) baked potato with filling
- 100g pancakes (2 stack) + 30g syrup

Nutritious carbohydrate-protein recovery snacks (contain 50g CHO + valuable source of protein and micronutrients)

- 250-300ml liquid meal supplement
- 250-300ml milk shake or fruit smoothie
- 1-2 sports bars (check labels for carbohydrate and protein content)
- 1 large bowl (2 cups) breakfast cereal with milk

- 1 large or 2 small cereal bars + 200g carton fruit-flavored yogurt
- 220g 3 slices of toast
- 1 bread roll with cheese/meat filling + large banana
- 300g (bowl) fruit salad with 200g fruit-flavored yoghurt
- 2 crumpets with thick spread peanut butter + 200ml flavored milk
- 300g (large) baked potato + cheese filling + glass of milk
- 200g (1/3-1/4 pizza) with chicken/meat and vegetables

It is important for athletes to avoid the common restrictive eating patterns prior to competition, followed by binge eating afterwards. This pattern is detrimental both to athletic performance and to psychological well being. Athletes who are in tune with their body needs are much more likely to be successful and enjoy competing to its full potential

I believe that meal replacement drinks such as Gator Pro are valuable adjuncts to a athlete's diet. They can be beneficial when consumed before a competition because they keep weight gain to a minimum due to the low stool residue, yet they provide needed calories and fluids. They are also absorbed more quickly than solids and can be consumed closer to competition. The athlete must experiment in advance to determine which drinks best suit their individual needs. High-carbohydrate drinks such as Gator Lode may be more appropriate as a recovery carbohydrate following exercise, when sometimes appetite is reduced. I do not recommend other dietary supplements other than a well-balanced multi-vitamin-mineral supplement.

These are suggestions for nutrition that can help you have more energy and be a better athlete...