

Principles of Sports Nutrition



Brenda Turner, M.S., R.D.
July 21, 2008

Nutrition for the Athlete

Individuals should nourish themselves with a diet consisting of fruits, vegetables, whole grains, lean proteins, and healthy fats no matter what age or athletic ability.



Nutrition Guidelines for Athletes Applies to the General Population

Emphasize:

- Fruits and vegetables
- Whole grains
- Smaller portions
- Healthy snacks between meals
- Balance and variety
- Lean protein sources
- Breakfast and prevention of getting too hungry
- Whole foods (minimize processed foods)
- Eat in moderation

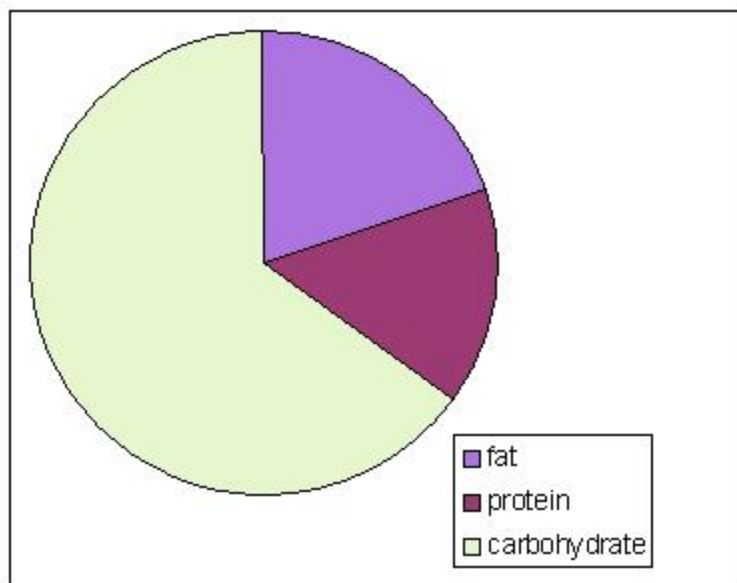
Food Guide Pyramid

MyPyramid

MyPyramid.gov



Athletes Diet



55-65% Carbohydrate*

10-15% Protein

25-30% Fat

* \geq 40 years old – 45-60% CHO

Fuel Before Exercise

- Eat 2-4 hours prior to exercise
- 200 – 600 Kcal is adequate
- Consume foods high in Carbohydrates (CHO), moderate protein and fiber, low in fat
- Adequate hydration

Fuel During Exercise > 90 minutes

- CHO is preferred fuel
 - power gels or liquid (especially for impact exercise)
 - Food as simple carbohydrate (bananas, apples)
- Protein and fat consumption not advised
- Proper hydration (drink q 15 minutes)

Post Exercise Meal

- Eat within 2 hours after exercise
 - Muscles are insulin sensitive
- Consume 3:1 of Carbohydrate to Protein (8 ounces of chocolate milk or yogurt with a banana)
- Important for vigorous training

Carbohydrate Facts



- Necessary for peak athletic performance.
- Up to 2000 calories worth of carbs can be stored as glycogen, enough to run 20 miles.
- Use increases with ↑ intensity of exercise.
- IF LOW - ↑ oxidation of fats → FFA + glycerol for energy. Slow process which may cause early fatigue.

How can athletes maximize glycogen stores?

- High carbohydrate foods throughout the day.
- Carb-rich foods during exercise.
- High-carb, moderate protein meal/snack post exercise (3:1 carb:protein ratio).
- Glycogen loading: Well trained muscles can store 20-50% more glycogen than untrained muscles.

Simple vs. Complex Carbohydrates

- Simple CHO intake during exercise – not same hypoglycemic effect as pre exercise consumption.
- Both provide glucose needed to fuel muscles and the brain.
- Complex tend to have more vitamins and minerals than simple.

Protein



- Builds fat free muscle mass.
- Sports diets should provide adequate protein not excessive protein.
- Can be converted to glucose for energy or converted to stored fat.
- Most Americans eat far more protein than their protein needs suggest.

Protein Needs for Athletes

Healthy Adults: 0.8gm/kg

Power Athletes: 1.6-1.7gm/kg

Endurance Athletes: 1.2-1.6
gm/kg



Protein Value of Foods

Grain	½ cup cooked 1oz bread	3 grams protein
Vegetables	½ cup cooked 1 cup raw	2 grams protein
Dairy	1 cup milk 1 cup yogurt	8 grams protein
Meat	1 oz meat ½ cup beans	7 grams protein
Fruit	1 piece ½ cup	Negligible

Protein Supplements

- Protein powders: Ex: MegaMass, Muscle Builder
 - Separate amino acids such as ornithine and arginine are also used.
 - Protein powders do not offer the vitamins and minerals that protein *foods* do.
 - Bulking up is a matter of exercise and extra calories, not supplements.

Scientific Evidence

- Currently there is no scientific evidence supporting the use of protein powders over eating protein foods.
- No scientific evidence suggesting that protein intakes exceeding .9 gm/lb provides additional advantages.

*More is not better; Too much can be unhealthy.

Hydration



Athletes at greatest risk for dehydration:

- Inadequate fluid intake
- Sweat profusely (\uparrow Na^{++} , Cl^{-} loss)
- Hot and dry environment
- Don't replace fluid during and after
- Drink only when thirsty, especially elderly

Fluid Loss in Athletes

Affected by:

- High altitude.
- Temperature and humidity.
- Sweating.
- Exercise duration and intensity.
- Clothing.

Athlete Hydration Guidelines

- Drink at least half body weight in ounces every day.
 - 150lbs= 75 ounces per day.
- More if caffeine and alcohol are consumed secondary to increased urine production.

Hydration... continued

<u>When</u>	<u>Amount</u>	<u>Time frame</u>
Day before event	Generous	24 hours per day
Day of event	13-26 ounces	2-3 hours before event
During event	6-12 ounces	Every 15 minutes
After event	150% of weight lost	Directly after event

Sports Drinks



- Just water is recommended in regular exercise of moderate intensities.
- Sports drinks= for athletes that are exercising at high intensity for 60 minutes or more.
- If sweat profusely when exercising during high heat index, may be beneficial.
- Good way to replace fluid, electrolytes, and glucose when necessary.

Sports Nutrition Beverages

Drink	Ounces	CHO, g	Na, mg	K, mg
Propel Fitness	8	3	35	0
Gatorade	8	14	110	30
G2	8	14 (7 sugar)	110	30
Powerade	8	17	55	30
Vitamin H2O	8	13	0	0
Red Bull	12	40	290	0

Beverage between 4-8% CHO may help with performance of \geq 90 minutes

Conclusion

- Athletes should eat a balanced diet rich in fruits, vegetables, carbohydrates, lean protein and healthy fats.
- Carbohydrates are the primary source of energy for the muscles, not protein.
- Athletes should be encouraged to consume the right amount of carbohydrates and protein.
- Many supplements, primarily ergogenic aids, do not have adequate research backing their effectiveness.
- Some supplements may be harmful
- It is important to discuss with athletes the supplements they may be taking.

References

1. Nancy Clark's Sports Nutrition Guidebook, Third Edition. Nancy Clark, MS, RD. 2003.
2. American College of Sports Medicine, *Current Comment*
2. www.goodhealth.com/articles/2008/01/28/eating.
3. <http://gssiweb.org/ShowArticle.aspx?articleid=667>
4. www.men.wedmd.com
5. www.rd411.com/article
6. www.rps.psu.edu/probing/sportsdrinks.html
7. <http://sportsmedicine.about.com/od/performanceenhancingdrugs/a/ErgogenicAids.html>
8. ACSM's Guidelines for Exercise Testing and Prescription, 7th Edition, 2006.