

Nutrition

Fact Sheet

Fueling the School-Aged Athlete – The Score on Precompetition Meals

Do you ever wonder what to feed school-aged athletes before they exercise or compete? The answer lies with the individual athlete. School-aged athletes should listen to their bodies. From experience, they will know which foods make them feel the best both physically and mentally. Tried and true foods should be the basis for precompetition meals. Intensity, type of activity, and individual athlete preferences will influence their selection. A high school athlete may prefer a light snack before a running event but will eat a pancake breakfast before a swimming meet. Precompetition meals based on the athlete's preference can range from special foods to no food at all.



Goals of Precompetition Meals

- Prevent hunger during the competition or activity.
- Top-off carbohydrate stores as liver or muscle glycogen.
- Provide fluid for hydration.
- Possibly settle a nervous stomach.
- Provide a physiological edge with knowledge that the body is fueled and ready to go.

School-aged athletes should be encouraged to routinely eat a healthy diet that provides energy and nutrients needed for growth and extra exercise (American Dietetic Association [ADA], 1996a, 1996b). Consistently making healthy food choices contributes to the overall quality of the diet and optimizes sports performance.



Nutrition *Fact Sheet*



What is eaten by a school-aged athlete right before competition is not as important as what they eat every day. Precompetition meals are not a quick fix or magic bullet that will dramatically enhance performance (Harkins, Carey, Clark, & Benardot, 1993). However, the precompetition meal is important. Exercising in a fed rather than fasted state has been shown to improve performance (Neufer et al., 1987; Wright, Sherman, & Dernback, 1991). School-aged athletes who eat too little before exercising may feel hungry and tire easily causing their performance to suffer. Those who eat too much may feel uncomfortable and not perform well.

The precompetition meal should be high in complex carbohydrates (grains, vegetables, fruits), moderate in protein (meats, eggs, milk products), and low in fat and fiber (Cotugna, Vickery, & McBee, 2005). Ideally, a precompetition meal leaves an athlete feeling physically and mentally comfortable.

Precompetition Meal Tips

- Eat about 2–4 hours before the event.
- Eat high-carbohydrate, lowfat foods.
- Eat your personal favorite precompetition foods.
- Avoid foods that are not easily digested (varies for the individual athlete).
- Include adequate fluids.
- Include adequate calories.
- Avoid experimenting with new foods.

Precompetition meals tailored for the individual athlete should consider food preferences, psychological factors, and digestibility of the food. Favorite foods can make an athlete feel physically and mentally prepared to compete. Rituals are common among athletes and this can be applied to perceived lucky precompetition meals or foods. Consuming these foods may give them a psychological edge.

Meals high in complex carbohydrates are recommended because they are quickly digested and absorbed. Many athletes, especially those engaged in running activities, prefer not to feel too full. Foods high in fat, protein, and fiber take more time to digest and remain in the digestive tract longer. Stress and tension also decrease blood flow to the digestive tract which slows digestion and absorption. For this reason, foods that are more difficult to digest should be avoided or limited.

Nutrition *Fact Sheet*

Possible Foods to Avoid before Competition

- Fatty fried foods (doughnuts, nachos, fries)
- Sausage, bacon, hotdogs
- Candy bars, sugary foods
- Sauces and gravy
- High fiber (100% bran, prunes)
- Gas producing foods (cabbage, beans)



Focus on Familiar Foods

Although recommendations about carbohydrates have been developed for adult athletes, much is unknown about fuel needs of school-aged athletes. In general, a high carbohydrate diet is recommended for most athletes including teenagers (Meyer et al., 2007; Montfort-Steiger & Williams, 2007). The optimal amount of dietary carbohydrates will depend on the specific sport or activity, individual needs, and personal preferences. All healthy children can benefit from a diet that contains about 45–65% of energy from carbohydrate (ADA, 2008).

Eating a carbohydrate-rich snack, 2–4 hours before competition, will top-off the tank. Depending upon the athlete and activity, carbohydrate stores can be replenished by eating carbohydrate-rich snacks 0–4 hours after competition (Burke et al., 2004).

Liquid Meals

An alternative approach for school-aged athletes who have sensitive stomachs may be an occasional precompetition liquid meal. Digestive problems before competing have been reported by 40–50% of endurance athletes (Clark, 2008). Liquid meals rarely cause discomfort because they require less digestion and quickly pass through the digestive tract. A liquid precompetition meal might be a homemade yogurt, milk, and fruit smoothie; commercial breakfast shake; or lowfat liquid meal product.

Remember, a liquid precompetition meal is not a substitute for regular well-balanced meals. Sometimes a school-aged athlete may be too nervous to eat before an athletic event. Under such circumstances, they should be encouraged to routinely eat healthy meals and make a special effort to consume a high carbohydrate diet the day before competition when they feel less stressed.

Nutrition *Fact Sheet*

Sport Event and Meal Timing

The amount of time before an event and the duration, intensity, and type of athletic activity will influence the amount and type of food eaten. In general, if an athlete has

- 3–4 hours before exercise or competition, eat a heartier meal (more calories, more food, moderate fat intake),
- 2–3 hours, eat a small meal (lowfat, high-carbohydrate),
- 1–2 hours, eat a liquid or blended meal, small snack, and
- < 1 hour, a light carbohydrate snack as tolerated (Harkins, Carey, Clark, & Benardot, 1993).

Sugary Foods

Consuming sugary foods like candy bars, soft drinks, and jelly beans right before exercise or competition has not been adequately studied in school-aged athletes (Montfort-Steiger & Williams, 2007). Initial research found that some adult athletes who ate sugary foods right before exercise released more

insulin resulting in a drop in blood glucose and increased fatigue (Hargreaves, Costill, Katz, & Fink, 1985). In contrast, other studies found eating sugary foods before events might increase performance (Alberici, Farrell, Kris-Etherton, & Shively, 1993; Febbraio & Stewart, 1996; Jacob & Sherman, 1999). Individual athletes can only determine from experience if consuming sugary foods before competition gives them an energy boost or leaves them feeling fatigued.



School-aged athletes are different from adults and appear to use carbohydrates differently during exercise and may be more insulin resistant at certain stages of maturity (Montfort-Steiger & Williams, 2007). Sugary foods can harm teeth (Jones & Elam, 2003), and all children and adolescents should be encouraged to choose foods and beverages that are low in added sugar (Dietary Guidelines Advisory Committee, 2004).

Nutrition *Fact Sheet*

Precompetition Meal Suggestions

| Breakfast | Lunch/Dinner | Snacks |
|--|---|---|
| Oatmeal Sliced banana Multi-grain toast Blueberry jam Skim or lowfat milk Grape juice | Whole wheat pita pocket with lean sliced turkey, tomato, and lettuce Grapes Skim or lowfat milk | Minestrone soup Chicken noodle soup Sweet potato Baked potato Lowfat yogurt smoothie |
| Pancakes (light on the syrup and butter) Fresh strawberries Skim or lowfat milk Orange juice | Pasta with tomato sauce Small garden salad (small amount of dressing) Skim or lowfat milk | Bagels English muffins Lowfat fruit muffins Dry cereal Crackers Bread sticks Pretzels Bread Tortillas |
| Bagel Carrot raisin cream cheese spread Lowfat yogurt Pineapple juice | Thick crust vegetable pizza (small amount of cheese) Mixed fruit cup Tomato juice | Yogurt Skim or lowfat milk Granola bar High carbohydrate sports bars Sports drinks Animal crackers Graham crackers Lowfat pudding |
| Scrambled eggs English muffin Strawberry jam Cantaloupe Skim or lowfat milk | Chicken vegetable stir-fry Brown rice Vanilla lowfat pudding Orange juice | Fruit Apples, oranges, bananas, peaches, plums, cherries Watermelon Vegetable juice Dried fruit |

Nutrition *Fact Sheet*

For More Information

American Dietetic Association. www.eatright.org

BAM! Body and Mind. www.bam.gov

CDC Fruits and Veggies – More Matter (Centers for Disease Control and Prevention, HHS, NCI). www.fruitsandveggiesmatter.gov

MyPyramid for Kids. www.mypyramid.gov

PBH Fruits and Veggies – More Matter. www.fruitsandveggiesmorematters.org

President's Council on Physical Fitness and Sports. www.fitness.gov

Recipes from a Healthier You. (Based on the Dietary Guidelines for Americans, 2005). www.health.gov

SCAN–Sports, Cardiovascular, and Wellness Nutritionists – A Practice Group of the American Dietetic Association. www.scandpg.org

References

Alberici, J. C., Farrell, P. A., Kris-Etherton, P. M., & Shively, C. A. (1993). Effects of pre-exercise candy-bar ingestion on glycemic response, substrate utilization, and performance. *International Journal of Sports Nutrition*, 3, 323-333.

American Dietetic Association. (1996a). Timely statement of the American Dietetic Association: Nutrition guidance for child athletes in organized sports. *Journal of the American Dietetic Association*, 96, 610-611.

American Dietetic Association. (1996b). Timely statement of the American Dietetic Association: Nutrition guidance for adolescent athletes in organized sports. *Journal of the American Dietetic Association*, 96, 611-612.

Clark, N. (2008). *Nancy Clark's sports nutrition guidebook* (4th ed.). Champaign, IL: Human Kinetics.

Cotugna, N., Vickery, C. E., & McBee, S. (2005). Sports nutrition for young athletes. *Journal of School Nursing*, 21, 323-328.

Dietary Guidelines Advisory Committee. (2004). *The Report of The Dietary Guidelines Advisory Committee on Dietary Guidelines for Americans, 2005*. U.S. Department of Health and Human Services and U.S. Department of Agriculture. Retrieved June 26, 2008, from <http://www.health.gov/DietaryGuidelines/dga2005/report/default.htm>

Febbraio, M. A., & Stewart, K. L. (1996). CHO feeding before prolonged exercise: Effect of glycemic index on muscle glycogenolysis and exercise performance. *Journal of Applied Physiology*, 81, 1115-1120.

Hargreaves, M., Costill, D. L., Katz, A., & Fink, W. J. (1985). Effects of fructose ingestion on muscle glycogen usage during exercise. *Medicine & Science in Sports & Exercise*, 17, 360-363.

Nutrition *Fact Sheet*

- Harkins, C., Carey, R., Clark, N., & Benardot, D. (1993). Protocols for developing dietary prescriptions. In D. Benardot, (Ed.), *Sports nutrition a guide for the professional working with active people* (pp. 170-185). Chicago, IL: American Dietetic Association.
- Jacob, K. A., & Sherman, W. M. (1999). The efficacy of carbohydrate supplementation and chronic high – carbohydrate diets for improving endurance performance. *International Journal of Sports Nutrition*, 9, 92-115.
- Jones, J. M., & Elam, K. (2003). Sugar and health: Is there an issue? *Journal of the American Dietetic Association*, 103, 1058-1060.
- Montfort-Steiger, V., & Williams, C. A. (2007). Carbohydrate intake considerations for young athletes. *Journal of Sports Science and Medicine*, 6, 343-352.
- Neufer, P. D., Costill, D. L., Flynn, M. C., Kirwin, J. P., Mitchell, J. B., & Houmard, J. (1987). Improvements in exercise performance: Effects of carbohydrate feedings and diet. *Journal of Applied Physiology*, 62, 983-988.
- Wright, D. A., Sherman, W. M., & Dernback, A. R. (1991). Carbohydrate feeding before, during or in combination improve cycling endurance performance. *Journal of Applied Physiology*, 71, 1082-1088.

For more information, contact NFSMI at 800-321-3054 or www.nfsmi.org.

This project has been funded at least in part with Federal funds from the U.S. Department of Agriculture, Food and Nutrition Service through a grant agreement with The University of Mississippi. The contents of this publication do not necessarily reflect the views or policies of the U.S. Department of Agriculture, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government. The University of Mississippi is an EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA Employer.
