University of Illinois at Urbana-Champaign
College of Agricultural, Consumer and Environmental Sciences
Cooperative Extension Service
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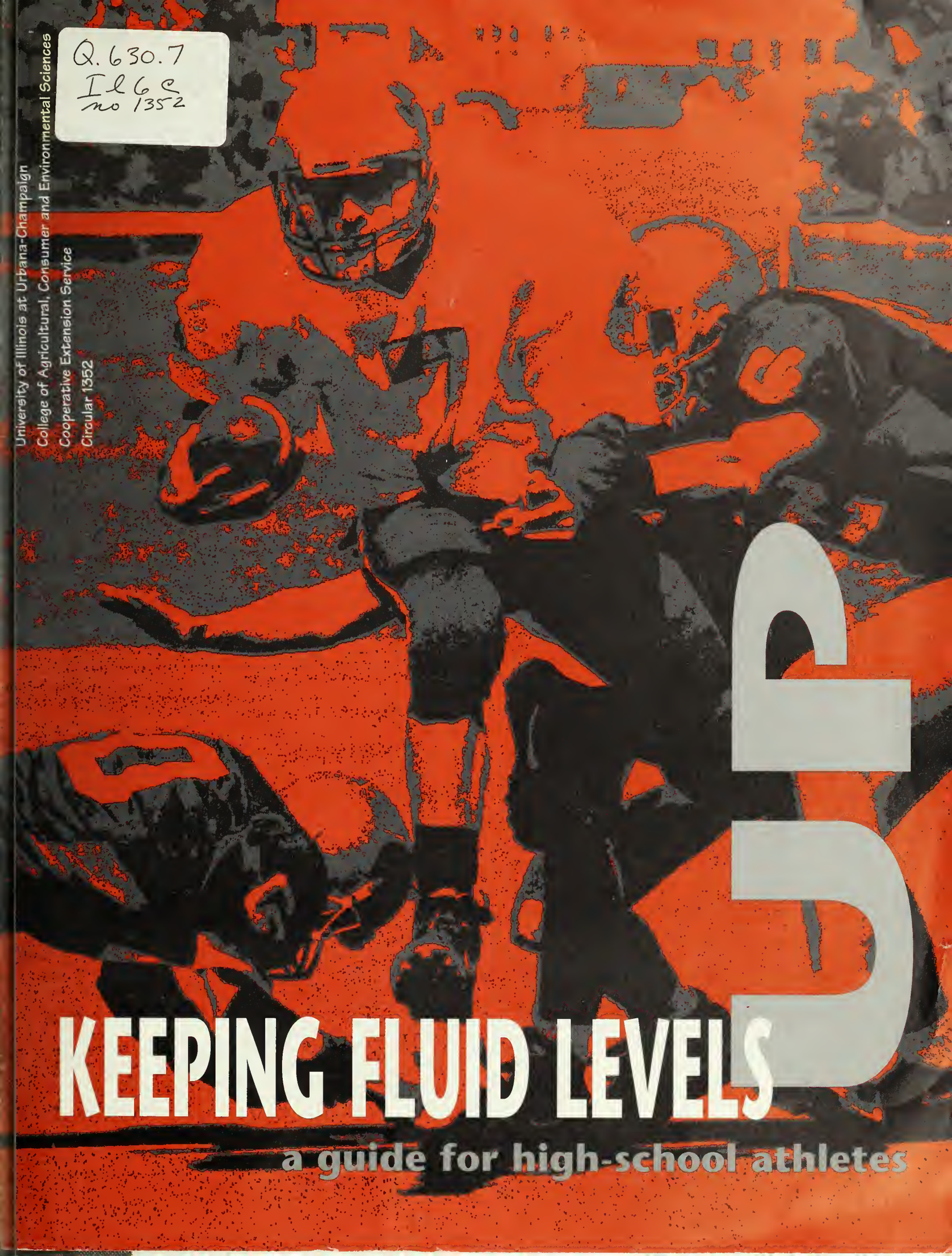


KEEPING FLUID LEVELS UP

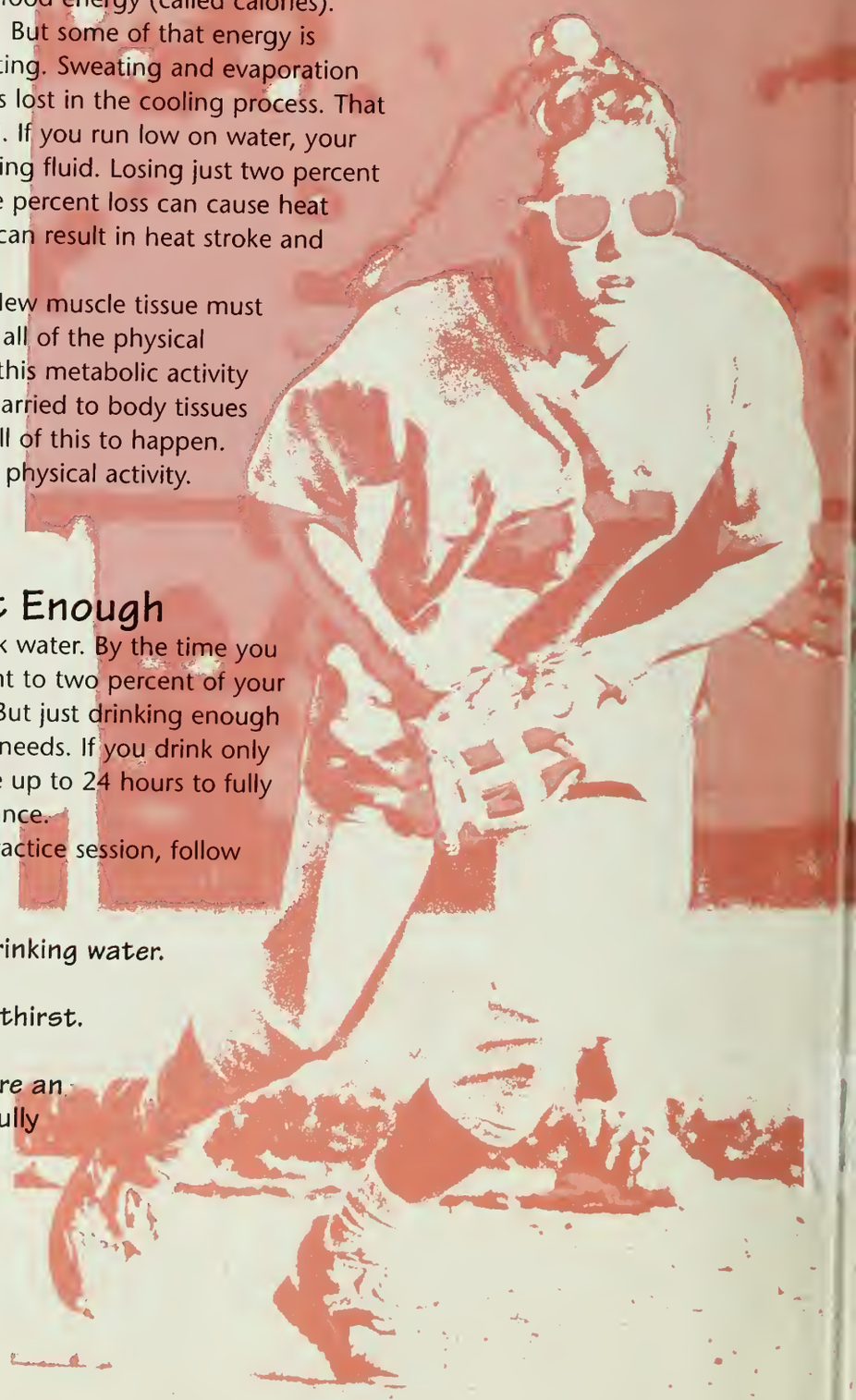
a guide for high-school athletes

Water is a basic necessity for all life. Without it, life can't exist. Even when water is limited, living organisms suffer. You are no exception. For young athletes like yourself, not enough water means you can't do your best. It can even cause serious health problems.

Our blood circulates like an ocean within us. The water in blood helps carry nutrients and energy to our body cells. It also carries waste products away from our cells for excretion from our body. Water helps regulate our body temperature, too—an important factor for all of us.

As a young athlete, you have a special need for water. When you participate in a sport like track or volleyball, you burn a lot of food energy (called calories). Some of that unleashed energy powers muscles. But some of that energy is released as heat. Water keeps you from overheating. Sweating and evaporation from the skin cools you down. However, water is lost in the cooling process. That can be dangerous if the water is not replenished. If you run low on water, your body can overheat, like a car that is low on cooling fluid. Losing just two percent of the body's water can hurt performance. A five percent loss can cause heat exhaustion. A seven percent to ten percent loss can result in heat stroke and death. Dehydration can kill.

Young athletes have a lot of growing to do. New muscle tissue must be made. Bones need to grow rapidly. And with all of the physical activity, some tissues need to be repaired. All of this metabolic activity requires an abundance of nutrients and energy carried to body tissues and waste products carried away. Water allows all of this to happen. Water is vital for your body's growth, repair, and physical activity.



Just Satisfying Thirst Is Not Enough

Thirst is your body's signal that you need to drink water. By the time you feel thirsty, you may have already lost one percent to two percent of your water—and that's enough to hurt performance. But just drinking enough to satisfy your thirst may not supply your body's needs. If you drink only enough to satisfy your thirst, your body may take up to 24 hours to fully rehydrate its cells and regain maximum performance.

When you participate in a sporting event or practice session, follow these guidelines:

- ✔ Don't wait until you are thirsty before drinking water.
- ✔ Drink more than enough to satisfy your thirst.
- ✔ Drink more than you think you need before an event or practice to make sure you are fully rehydrated.

Restricting Water—A Deadly Practice

There is an old misconception that is dying hard. It is similar to the hard-line "no pain: no gain" training philosophy that we now know is also false.

Many coaches and athletes once believed that restricting water during a competition or practice session toughened an athlete—that somehow athletes needed less water. Unfortunately, some people still follow this practice that lowers performance and is downright dangerous. Without enough water to cool itself, the body can overheat to dangerous levels.

Conditioned athletes need more water—not less. The conditioned athlete is able to store and burn more energy in a shorter time. That means your body releases more heat, requires more cooling, loses more water, and needs more water to replenish its stores. Also, you may have increased your sweating response, which means you lose even more water. As an in-shape athlete, you need more water than other people.

When you feel exhausted and hot during a workout or game, drinking large amounts of water very rapidly may cause discomfort or stomach cramps. But that is not a good reason to restrict water. Drinking moderate amounts at frequent intervals is the best strategy during competition or practice. ***About one cup (six to eight ounces) of cool water every 15 to 20 minutes during an activity is about right for most athletes.*** Some athletes can drink a bit more than this at each interval. Cool water (40° to 50° Fahrenheit) is best. Cool water helps absorb body heat. And it empties from the stomach into the intestine at a fast rate, which allows it to be absorbed rapidly into the body.

Dehydration Is Not a Way to M

At one time, wrestlers purposely dehydrated to lose weight rapidly and make weight categories. Fortunately, this practice is decreasing, but it still occurs.

Wrestlers dehydrated in many ways. Some exercised in hot rooms, often while wearing rubber suits in an attempt to sweat off water. Others simply did not drink any fluids or eat foods high in water. Still others lost water by spitting in a cup all day. And some took diuretics (water pills) to increase urine output.

Unfortunately, a few wrestlers used a combination of these methods to reduce body water, lose weight, and make weight categories. ***None of these practices is recommended. Using them in combination is especially dangerous.***

Dehydration poses both short- and long-term dangers to your health. In the short-term, your body's cooling system can't work properly and you can overheat, suffer heatstroke, and possibly die. Long-term, repeated episodes of dehydration can be damaging to your kidneys.

Weighing In, Weighing Out, and Drinking the Difference

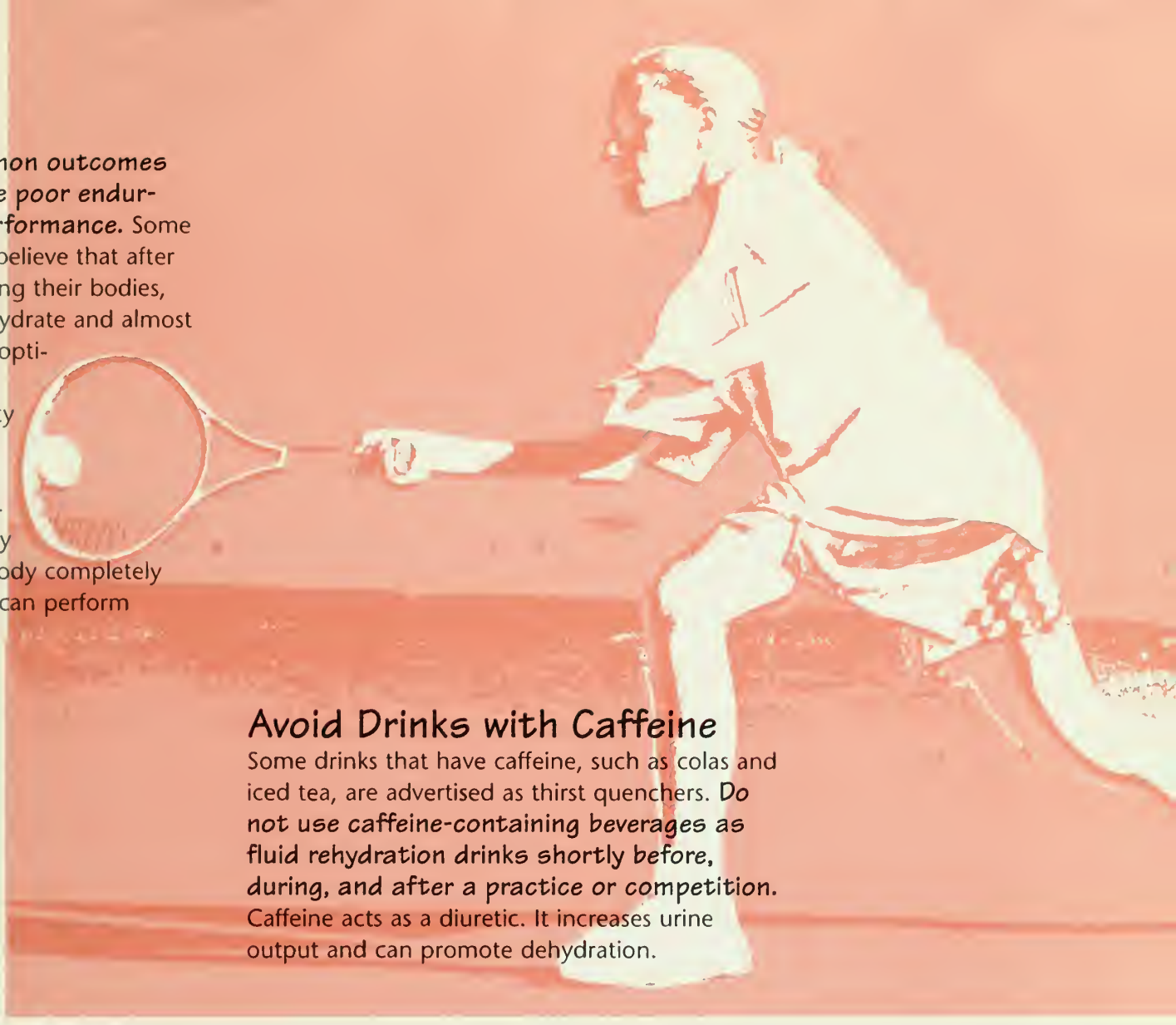
Most of the weight you lose during an event or training session is water lost through sweat. Of course, you lose some weight when your body burns materials for energy. For example, the glycogen stored in liver and muscle cells is used for energy, which results in some weight loss. Some fat and protein is burned for energy, too, and that results in additional weight loss. However, most of the weight you lose during strenuous physical activity is water lost through perspiration.

Some coaches and trainers weigh athletes before a contest or workout and then again after the activity is over. Before the athletes leave the facility, they are encouraged to drink water until they are within one pound of their pre-session weight. Two eight-ounce cups of water are consumed for each pound lost. This practice—weighing in, weighing out, and drinking the difference—is an excellent way of guarding against dehydration. You can do this on your own even if your coach doesn't require it.

Are Sport Drin

Your biggest concern is getting enough water—pure, cool water. Even the salt you lose while sweating can be easily replaced by adding salt to foods.

Plain, cool water is the fluid of choice when the actual exercise does not last longer than 60 to 90 minutes. And that includes most situations, even a tough practice session, a hard-fought football game, or a track meet. You don't need an energy source in the fluid you drink to rehydrate. During these normal situations, if you have been eating and training properly, you should have enough energy stored as liver and muscle glycogen to power you through.



ke Weight

he most common outcomes f ehydration are poor endur- e and poor performance. Some tes mistakenly believe that after posely dehydrating their bodies, can rapidly rehydrate and almost mediately regain opti- m performance. le drinking plenty uids is the right g to do after oming dehydrat- it may take many rs before your body completely drates and you can perform r best.

Avoid Drinks with Caffeine

Some drinks that have caffeine, such as colas and iced tea, are advertised as thirst quenchers. ***Do not use caffeine-containing beverages as fluid rehydration drinks shortly before, during, and after a practice or competition.*** Caffeine acts as a diuretic. It increases urine output and can promote dehydration.

owever, in some situations where xercise is unusually long or several es occur in a short period of time,

Necessary?

sport drinks containing carbohydrates and rolytes may offer you an advan- . During these situations, you may ow on energy and electrolytes. For mple, if you are a long-distance st, you should consider using a drink. If you must compete in a nament that has more than one e a day or several games in just a days, you could benefit from a drink that supplements your gy and electrolyte supply.

There are many different commercial sport drinks available. They contain varying kinds and amounts of carbohydrates and electrolytes. For example, GATORADE® Thirst Quencher is a glucose electrolyte solution of about six percent carbohydrate concentration. Exceed® is a glucose polymer solution of about seven percent carbohydrate concentration. If you use a sport drink, pick one that has less than eight percent total solids (carbohydrates, electrolytes). More concentrated solutions can delay fluid absorption. They must be diluted with plain water before you use them as a fluid replacement drink. Also, avoid sport drinks that contain fructose as the only source of carbohydrate. Fructose may delay gastric emptying of fluid and cause upset stomach. And fructose must first be converted to glucose before it can be used for energy. This conversion means you can't use fructose as an energy source as quickly as other carbohydrates.

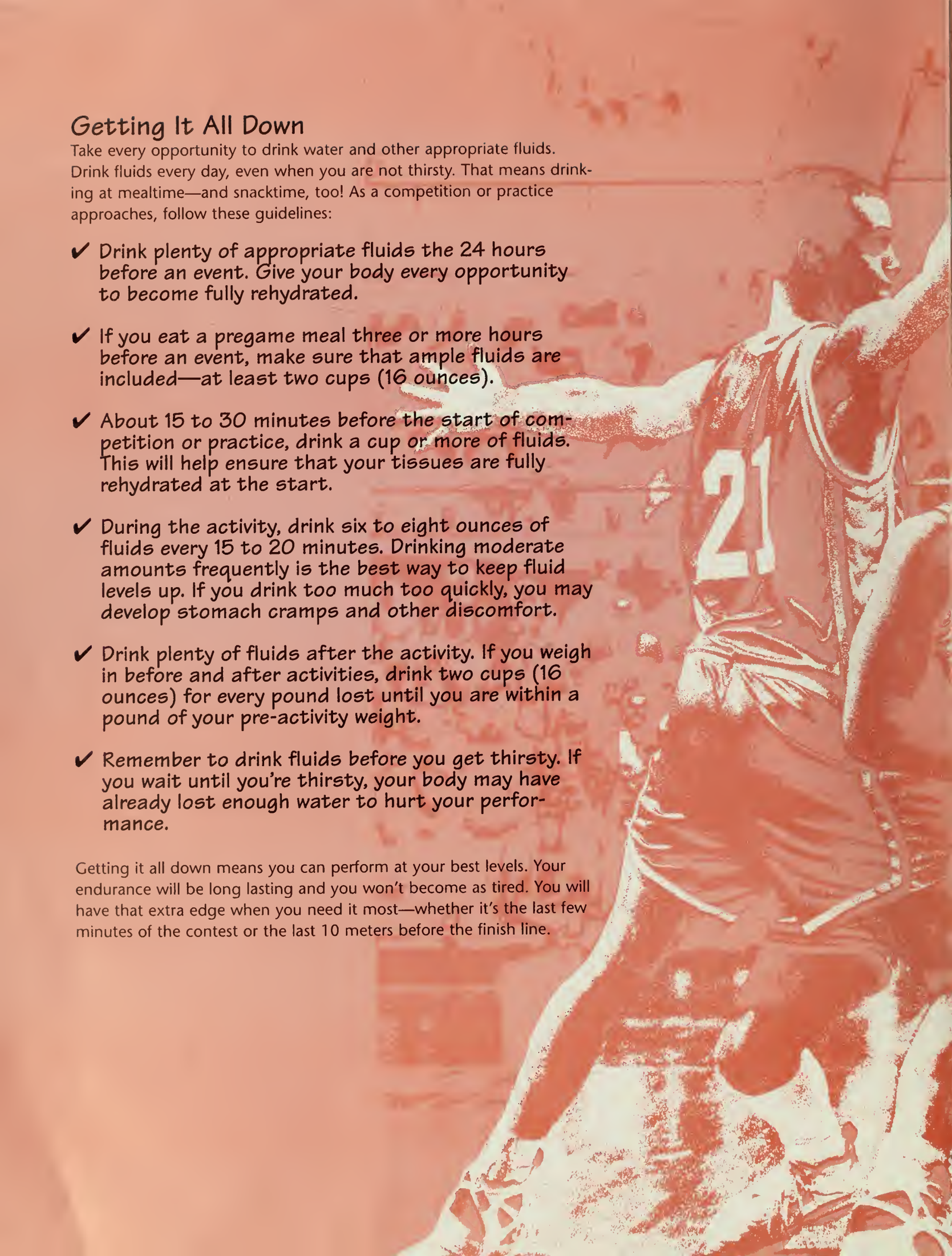
Fruit juices like orange juice should also be diluted if you're using them as a fluid replacement drink before, during, or after an event or practice session. Fruit juices vary from 10% to 17% carbohydrate concentration. Dilute them with an equal amount of pure water before you use them as fluid replacement. Of course, when you drink juices at other times, such as with a meal or snack, you don't have to dilute them

Getting It All Down

Take every opportunity to drink water and other appropriate fluids. Drink fluids every day, even when you are not thirsty. That means drinking at mealtime—and snacktime, too! As a competition or practice approaches, follow these guidelines:

- ✔ Drink plenty of appropriate fluids the 24 hours before an event. Give your body every opportunity to become fully rehydrated.
- ✔ If you eat a pregame meal three or more hours before an event, make sure that ample fluids are included—at least two cups (16 ounces).
- ✔ About 15 to 30 minutes before the start of competition or practice, drink a cup or more of fluids. This will help ensure that your tissues are fully rehydrated at the start.
- ✔ During the activity, drink six to eight ounces of fluids every 15 to 20 minutes. Drinking moderate amounts frequently is the best way to keep fluid levels up. If you drink too much too quickly, you may develop stomach cramps and other discomfort.
- ✔ Drink plenty of fluids after the activity. If you weigh in before and after activities, drink two cups (16 ounces) for every pound lost until you are within a pound of your pre-activity weight.
- ✔ Remember to drink fluids before you get thirsty. If you wait until you're thirsty, your body may have already lost enough water to hurt your performance.

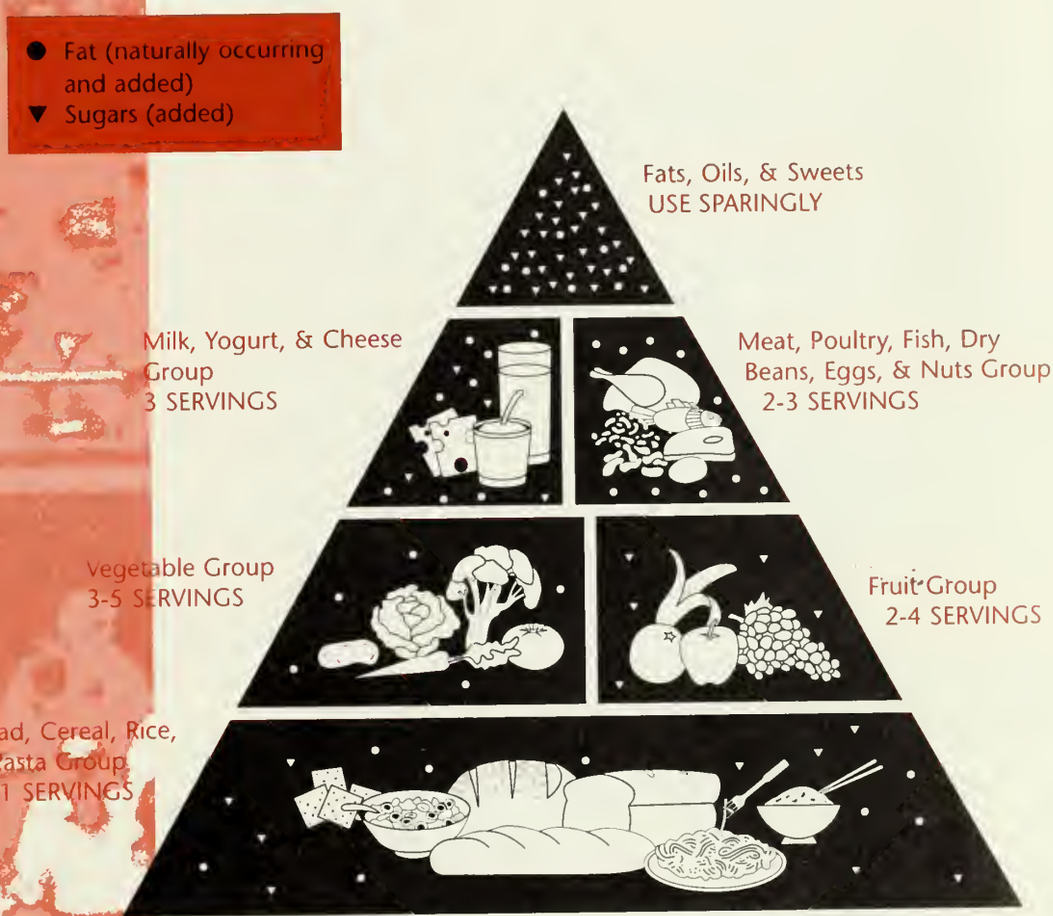
Getting it all down means you can perform at your best levels. Your endurance will be long lasting and you won't become as tired. You will have that extra edge when you need it most—whether it's the last few minutes of the contest or the last 10 meters before the finish line.



Remember to power up with good food every day so you can take full advantage of a well-hydrated body.

The Food Guide Pyramid is an excellent guide for the young athlete. The pyramid can help you select a nutritious diet that supplies plenty of energy.

For tips on using the Food Guide Pyramid to select a high-performance diet, see NCR Publication 584, *Keeping Energy Levels Up*.



Robert J. Reber, Associate Professor in Nutrition
Donald K. Layman, Professor in Nutrition
Designer: Lynn Hawkinson Smith; Editor: Terri Stone;
Photographer: Mimi Fittipaldi

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