

Western National Roundup 2010 FCS Bowl Study Resources

In addition to the guides included in this packet you will need to study:

- “My Pyramid” USDA (available at <http://www.mypyramid.gov>) – study information related to a 15 year old female who is active for 30-60 minutes a day.
- Be the E – available from National 4-H Council



HEALTH

Nutrition for the Athlete

no. 9.362

by J. Anderson, L. Young and S. Prior¹

Quick Facts...

Athletes achieve peak performance by training and eating a variety of foods.

Athletes gain most from the amount of carbohydrates stored in the body.

Fat also provides body fuel; use of fat as fuel depends on the duration of the exercise and the condition of the athlete.

Exercise may increase the athlete's need for protein.

Water is a critical nutrient for athletes. Dehydration can cause muscle cramping and fatigue.

Becoming an elite athlete requires good genes, good training and conditioning and a sensible diet. Optimal nutrition is essential for peak performance. Nutritional misinformation can do as much harm to the ambitious athlete as good nutrition can help.

Carbohydrates

Athletes benefit the most from the amount of carbohydrates stored in the body. In the early stages of moderate exercise, carbohydrates provide 40 to 50 percent of the energy requirement. Carbohydrates yield more energy per unit of oxygen consumed than fats. Because oxygen often is the limiting factor in long duration events, it is beneficial for the athlete to use the energy source requiring the least amount of oxygen per kilocalorie produced. As work intensity increases, carbohydrate utilization increases.

Complex carbohydrates come from foods such as spaghetti, potatoes, lasagna, cereals and other grain products. Simple carbohydrates are found in fruits, milk, honey and sugar. During digestion, the body breaks down carbohydrates to glucose and stores it in the muscles as glycogen.

During exercise, the glycogen is converted back to glucose and is used for energy. The ability to sustain prolonged vigorous exercise is directly related to initial levels of muscle glycogen. The body stores a limited amount of carbohydrate in the muscles and liver. If the event lasts for less than 90 minutes, the glycogen stored in the muscle is enough to supply the needed energy. Extra carbohydrates will not help, any more than adding gas to a half-full tank will make the car go faster.

For events that require heavy work for more than 90 minutes, a high-carbohydrate diet eaten for two to three days before the event allows glycogen storage spaces to be filled. Long distance runners, cyclists, cross-country skiers, canoe racers, swimmers and soccer players report benefits from a precompetition diet where 70 percent of the calories comes from carbohydrates.

According to the Olympic Training Center in Colorado Springs, endurance athletes on a high-carbohydrate diet can exercise longer than athletes eating a low-carbohydrate, high-fat diet. Eating a high-carbohydrate diet constantly is not advised. This conditions the body to use only carbohydrates for fuel and not the fatty acids derived from fats.

For continuous activities of three to four hours, make sure that glycogen stores in the muscles and liver are at a maximum. Consider taking carbohydrates during the event in the form of carbohydrate solutions. The current recommendation is a 6 to 8 percent glucose solution.

You can make an excellent home-brewed 7.6 percent sports drink with reasonable sodium amounts. Add 6 tablespoons sugar and 1/3 teaspoon salt to

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Table 1: Sample menu of a high carbohydrate diet.

Food item	Calories	Grams carbohydrate
Breakfast:		
8 ounces orange juice	120	28
1 cup oatmeal	132	23
1 medium banana	101	26
8 ounces low-fat milk	102	12
1 slice whole wheat toast	60	12
1 tablespoon jelly	57	15
Lunch:		
2-ounce slice ham	104	0
1 ounce Swiss cheese	105	1
2 slices whole wheat bread	120	25
1 leaf lettuce	1	0
1 slice tomato	3	1
8 ounces apple juice	116	30
8 ounces skim milk	85	12
2 cookies	96	14
Dinner:		
3 cups spaghetti	466	97
1 cup tomato sauce with mushrooms	89 5	19 1
2 tablespoons Parmesan cheese	45	0
4 slices French bread	406	78
1 slice angel food cake	161	36
1/4 cup sliced strawberries	13	3
1/2 cup ice cream	133	16
Snack:		
16 ounces grape juice	330	83
6 fig cookies	386	81
TOTAL	3,236	613
	(75% of total calories)	

Table 2: Recommendations for hydration.

Day before	Drink fluids frequently
Pre-event meal	2-3 cups water
2 hours before	2-2 1/2 cups water
1/2 hour before	2 cups water
Every 10-15 minutes during the event	1/2 cup cool (45-55 degrees F) water
After event	2 cups fluid for each pound lost
Next day	Drink fluids frequently (it may take 36 hours to rehydrate completely).

each quart of water. Dissolve sugar and cool. The salt translates into a sodium concentration of 650 mg/liter. This small amount is good for marathon runners.

Electrolyte beverages can be used if the athlete tolerates them, but other electrolytes are not essential until after the event. Experiment during training to find the best beverage for you.

Eating sugar or honey just before an event does not provide any extra energy for the event. It takes about 30 minutes for the sugar to enter the blood stream. This practice may also lead to dehydration. Water is needed to absorb the sugar into the cells. Furthermore, sugar eaten before an event may hinder performance because it triggers a surge of insulin. The insulin causes a sharp drop in blood sugar level in about 30 minutes. Competing when the blood sugar level is low leads to fatigue, nausea and dehydration.

A diet where 70 percent of calories comes from carbohydrates for three days prior to the event is sometimes helpful for endurance athletes. (See Table 1 for a sample menu.) Water retention often is associated with carbohydrate loading. This may cause stiffness in the muscles and sluggishness early in the event. A three-day regimen minimizes this effect. The previously suggested seven days of deprivation/repletion is not recommended due to increased risks of coronary heart disease. In addition, electrocardiograph abnormalities may occur and training during the deprivation phase may be difficult.

Water

Water is an important nutrient for the athlete. Athletes should start any event hydrated and replace as much lost fluid as possible by drinking chilled liquids at frequent intervals during the event. Chilled fluids are absorbed faster and help lower body temperature. (See Table 2.)

Fats

Fat also provides body fuel. For moderate exercise, about half of the total energy expenditure is derived from free fatty acid metabolism. If the event lasts more than an hour, the body may use mostly fats for energy. Using fat as

fuel depends on the event's duration and the athlete's condition. Trained athletes use fat for energy more quickly than untrained athletes.

Fat may contribute as much as 75 percent of the energy demand during prolonged aerobic work in the endurance-trained athlete. There is evidence that the rate of fat metabolism may be accelerated by ingesting caffeine prior to and during endurance performance. However, insomnia, restlessness and ringing of the ears can occur. Furthermore, caffeine acts as a diuretic and athletes want to avoid the need to urinate during competition.

Protein

After carbohydrates and fats, protein provides energy for the body. Exercise may increase an athlete's need for protein, depending on the type and frequency of exercise. Extra protein is stored as fat. In the fully grown athlete, it is training that builds muscle, not protein per se. The ADA reports that a protein intake of 10 to 12 percent of total calories is sufficient. Most authorities

A varied diet will provide more than enough protein as caloric intake increases.

Table 3: Two pre-event meal plans.

Pre-Event Meal Plan I (approximately 500 calories)	
Milk, skim	1 cup
Lean meat or equivalent	2 ounces
Fruit	1 serving (1/2 cup)
Bread or substitute	2 servings
Fat spread	1 teaspoon

Pre-Event Meal Plan II (approximately 900 calories)	
Milk, skim	2 cups
Lean meat or equivalent	2 ounces
Fruit	1 serving (1/2 cup)
Pasta or baked potato	1 cup 1 medium
Bread or substitute	2 servings
Vegetable	1 serving (1/2 cup)
Fat spread	1 teaspoon
Dessert: Angel food cake or plain cookies	1 piece 2

Resources

- *Winning Sports Nutrition, video and training manual, University of Arizona, 1995.*
- *Sports Nutrition Guidebook, by Nancy Clark, Leisure Press, 1990.*
- *For recipes, see Athlete's Kitchen by Nancy Clark, published by Bantam Books, 1983.*
- *Nutrition for Athletes: A Handbook for Coaches produced by the American Alliance for Health, Physical Education and Recreation, 1201 Sixteenth Street, NW, Washington, DC, 20036.*
- *Order a copy of You: A Guide to Food, Exercise and Nutrition from Colorado Dairy Council, Inc., 12450 North Washington Ave., P.O. Box 33120, Thornton, CO, 80233-0120; telephone (303) 451-7711; cost \$1.*

recommend that endurance athletes eat between 1.2-1.4 grams protein per kg of body weight per day; resistance and strength-trained athletes may need as much as 1.6-1.7 grams protein per kg of body weight. (A kilogram equals 2.2 pounds.)

Japanese researchers demonstrated that "sports anemia" may appear in the early stages of training with intakes of less than 1 gram/kg of body weight per day of high quality protein. To calculate your protein needs, divide your ideal weight by 2.2 pounds to obtain your weight in kilograms. Then multiply kilograms by the grams of protein recommended.

A varied diet will provide more than enough protein as caloric intake increases. Furthermore, Americans tend to eat more than the recommended amounts of protein. Excess protein can deprive the athlete of more efficient fuel and can lead to dehydration. High-protein diets increase the water requirement necessary to eliminate the nitrogen through the urine. Also, an increase in metabolic rate can occur and, therefore, increased oxygen consumption. Protein supplements are unnecessary and not recommended.

Vitamins and Minerals

Increased caloric intake through a varied diet ensures a sufficient amount of vitamins and minerals for the athlete. There is no evidence that taking more vitamins than is obtained by eating a variety of foods will improve performance. Thiamin, riboflavin and niacin (B vitamins) are needed to produce energy from the fuel sources in the diet. However, more than enough of these vitamins will be obtained from the foods eaten. Carbohydrate and protein foods are excellent sources of these vitamins. Furthermore, the B vitamins are water soluble and are not stored in the body. Some female athletes may lack riboflavin. Milk products not only increase the riboflavin level but also provide protein and calcium. The body stores excess fat-soluble vitamins A, D, E and K. Excessive amounts of fat-soluble vitamins may have toxic effects.

Minerals play an important role in performance. Heavy exercise affects the body's supply of sodium, potassium, iron and calcium. To replenish sodium lost through sweating, eat normally following the competition. Avoid excessive amounts of sodium. Eating potassium-rich foods such as oranges, bananas and potatoes supplies necessary potassium. Salt tablets are not recommended.

Sweating naturally increases the concentration of salt in the body. Salt tablets take water from the cells, causing weak muscles. They also increase potassium losses. Potassium is important to help regulate muscle activity. Salt added to beverages during endurance events may be helpful.

Iron carries oxygen and is another important mineral for athletes. Female athletes and athletes between 13 and 19 years old may have inadequate supplies of iron. Female athletes who train heavily have a high incidence of amenorrhea and thus conserve iron stores. Amenorrhea is the absence of regular, monthly periods. Iron supplements may be prescribed by a physician if laboratory tests indicate an iron deficiency. Excess iron can cause constipation. To avoid this problem, eat fruits, vegetables, whole grain breads and cereals.

Calcium is an important nutrient for everyone. Female athletes should have an adequate supply of calcium to avoid calcium loss from bones. Calcium loss may lead to osteoporosis later in life. Dairy products, especially low-fat choices, are the best source of calcium.

The Pre-Game Meal

A pre-game meal three to four hours before the event allows for optimal digestion and energy supply. Most authorities recommend small pre-game meals that provide 500 to 1,000 calories.

The meal should be high in starch, which breaks down more easily than protein and fats. The starch should be in the form of complex carbohydrates

Other Resources

- *Sports Nutrition Guidebook*, by Nancy Clark, Leisure Press, 1996.
- *Nutrition for Athletes: A Handbook for Coaches* produced by the American Alliance for Health, Physical Education and Recreation, 1201 Sixteenth Street, NW, Washington, DC, 20036 or visit their website at www.aahperd.org.
- Order a copy of *Eating for Peak Performance or Competition Nutrition* from Colorado Dairy Council, Inc., 12450 North Washington Ave., Thornton, CO, 80241; (800) 274-6455.
- Visit the American Dietetic Association's Web site at www.eatright.org for reliable nutrition information or to find a registered dietician.
- Visit the American College of Sports Medicine's Web site at www.acsm.org for a variety of information and brochures.
- *Position of the American Dietetic Association, Dietitians of Canada, and the American College of Sports Medicine: Nutrition and Athletic Performance*. Journal of the American Dietetic Association. 2000;100:1543-1556.

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(breads, cold cereal, pasta, fruits and vegetables). They are digested at a rate that provides consistent energy to the body and are emptied from the stomach in two to three hours.

High-sugar foods lead to a rapid rise in blood sugar, followed by a decline in blood sugar and less energy. In addition, concentrated sweets can draw fluid into the gastrointestinal tract and contribute to dehydration, cramping, nausea and diarrhea. Don't consume any carbohydrates one and a half to two hours before an event. This may lead to premature exhaustion of glycogen stores in endurance events.

Avoid a meal high in fats. Fat takes longer to digest. Fiber has a similar effect, as well.

Take in adequate fluids during this pre-game time. Caffeine (cola, coffee, tea) may lead to dehydration by increasing urine production.

Don't ignore the psychological aspect of eating foods you enjoy and tolerate well before an event. However, choose wisely — bake meat instead of frying it, for example.

Some athletes may prefer a liquid pre-game meal, especially if the event begins within two or three hours. A liquid meal will move out of the stomach by the time a meet or match begins. Remember, include water with this meal.

Regardless of age, gender or sport, the pre-game meal recommendations are the same. (See Table 3.) Following a training session or competition, a small meal eaten within thirty minutes is very beneficial. The meal should be mixed, meaning it contains carbohydrate, protein, and fat. Protein synthesis is greatest during the window of time immediately following a workout and carbohydrates will help replete diminished glycogen stores.

Maintain nutritional conditioning not only for athletic events, but all the time (See fact sheet 9.353, *Dietary Guidelines for Americans*). A pre-game meal or special diet for several days prior to competition cannot make up for an inadequate daily food intake in previous months or years.

Lifelong good nutrition habits must be emphasized. Combine good eating practices with a good training and conditioning program plus good genes, and a winning athlete can result!

Sources of Information and Materials

From Colorado State University Extension

Request other fact sheets from The University Resource Center, Colorado State University, 115 General Services Building, Fort Collins, CO 80523-4061; (970) 491-6198; Single copies are \$1.00. Fact sheets can also be downloaded from the Internet at www.ext.colostate.edu.

9.312, *Water-Soluble Vitamins*

9.315, *Fat-Soluble Vitamins*

9.324, *Vegetarian Diets*

9.353, *Dietary Guidelines for Americans*

9.354, *Sodium in the Diet*

9.355, *Potassium and Health*

9.356, *Iron: An Essential Nutrient*

References

- *Advances in Sports Medicine and Fitness*, Volume 2, 1989.
- *Nutrition for Fitness and Sports*, Melvin Williams; Brown, Benchmark, 1995.
- *Nutrition for the Recreational Athlete*, Catherine Jackson, editor; CRC Press, 1995.

Savings Accounts

Georgia 4-H Cotton Boll and Consumer
Jamboree 2004

What is a savings account?

A savings account is an account set up with a bank or credit union to keep your money in while earning interest. Interest is the money the bank pays you for keeping your money there.

What are the benefits of having a savings account?

It's Safe: A savings account is a safe, convenient and affordable way to save your money. It's much safer to keep your money at a bank than to keep a large amount of cash in your home. When you put your money in a bank, the bank keeps it in a fireproof locked safe. The federal government also insures your money. No matter what, you can't lose your money when it's in the bank.

It Pays: Banks pay you a fee, called interest, for keeping your money with them. The higher the interest rate, the more money you'll earn. And, the more money you put into your account, the more money you'll earn in interest. Automatically transferring money from your checking account to a savings account each payday makes paying yourself automatically much easier.

What are the costs of having a savings account?

As with other accounts, a bank may charge you fees for having a savings account. Every bank charges differently, so it pays to shop around. Some accounts are free, and others carry a general service charge. A lot of banks charge you if you do not maintain a minimum balance in your account, but not all accounts have minimum balance requirements. You can save a lot of money in fees by finding an account with low or no balance requirements.

What are the different types of savings accounts?

Banks offer a variety of ways for you to save your money and earn interest. The most common accounts are:

Basic Savings Account

The minimum deposit requirement for a basic account is low, from \$5 to \$200. Your money earns a relatively low interest rate, but you can put money into and take money

out of your account whenever you want. Basic saving accounts are also called passbook accounts.

Certificate of Deposit (CD)

This account earns a higher interest rate than a regular savings account, but you have to make a larger minimum deposit, generally between \$1,000 and \$5,000. You also have to keep your money in the CD for a certain period of time. If you take your money out before the end of the term, you may have to pay a penalty.

Money Market Accounts

This account earns a higher interest rate than a regular savings account, but you have to make a larger minimum deposit, averaging between \$500 and \$2,500. This account also limits the amount of times you can take out money each month.

Where can I open a savings account?

You should shop around for a financial institution that meets your needs. Look for a bank or credit union that is close to your home or work, open during the hours you need it to be and charges low or no fees for a savings account. Banks that offer online banking, make managing your finances very easy.

What's the difference between a bank and a Credit Union?

Banks store your money, and allow you to have easy access to it by writing checks or using ATM and debit cards. Banks insure your money with The Federal Deposit Insurance Corporation, which protects your account up to \$100,000 if the bank goes out of business. There are banks all over the country.

Credit Unions work like banks, but are nonprofit organizations. This means that you are more likely to get a loan, and get it at a better interest rate. Credit Unions are created for specific groups of people, like government employees or college graduates. Another kind of credit union, a community development credit union (CDCU) primarily serves low-income communities. Anyone living or working in those communities can join the CDCU serving that area. CDCUs are located in more than 300 urban and rural areas across the United States.

How do I manage my savings account after I open it?

The key to managing any bank account is maintaining good records. Your register is a tool for keeping track of the amount in your account, or the balance in your savings account. You need to write down every transaction - deposits, fees and withdrawals - in your register so that you'll always know how much money is in your account.

At the end of each month, you'll receive a statement of your account's activity from the previous month. You can use the statement to balance your account by comparing your register with your account statement. After all financial transactions have been recorded

in both places; the balances should be the same plus the interest you earned from the bank.

Things to Look for in a Savings Account:

Look for the account/institution that will best meet your needs. Compare accounts, and ask the following questions.

- Is the institution insured? Credit unions should be insured by the NCUSIF. A bank should have Federal Deposit Insurance Corp. (FDIC) insurance.
- What is the dividend/interest rate? Savings accounts generally have lower interest rates than other investments, but you'll still want to look for the best return you can get on your account.
- What's the annual percentage yield (APY)? The APY tells you how much your money can earn based on interest rate and frequency of compounding. The Truth in Savings Act requires all institutions to disclose APY, so consumers can compare accounts on an apples-to-apples basis.
- Does the institution offer tiered rates? Tiered rates apply to different balance amounts. If tiered rates apply, find out how.
- How often is interest compounded? Monthly? Quarterly?
- What is the minimum opening deposit?
- What is the minimum balance required?
- What fees apply to the savings account?
- Is there a charge if my account falls below a minimum balance?
- Is there a fee for closing the account?
- Is there a monthly maintenance fee?
- Am I required to use direct deposit in order to get a free account or reduced fees?
- Is there a limit on the dollar amount or number of transactions I can make?
- Are there any other fees or charges for the account? If so, what are they?
- Is there easy access to my money such as internet banking, ATM's, good banking hours, etc.?

Use the chart on the following page to help you compare savings accounts side by side:

SAVINGS ACCOUNT COMPARISON CHART	BANK 1	BANK 2	BANK 3	BANK 4
Opening Deposit Amount				
Monthly Min. Balance to Avoid Service Charges				
Interest Rate Structures				
Interest Rate Structure				
Monthly Service Charges				
Free Basic Checks				
Transaction Fees				
Withdrawals Per Month				
Ease of access to Money (hours, ATM, Internet banking, etc.)				
Other Considerations:				

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MP3 Players

MP3 players are definitely not one-size-fits-all. They come in a range of shapes and sizes, use different types of memory, and support different formats. Based on these and other features, certain players are better suited to certain uses--you should choose the player (or *players*) that meets your needs. Along with type of memory and compatible formats you should consider storage capacities, features, accessories and intended use when shopping for a player. It is also important to think about where you will get music and the software you will need.

The Two Basic Types MP3 Players

Hard-Drive Based MP3 Players

The MP3 players with the largest capacities are hard-drive MP3 players. They store the music and files on an internal hard drive, which means MP3 players of this type can have large capacities. Some feature up to 80GB of space, which would require an awful lot of music and videos to fill. The downside of hard drive MP3 players is that hard drives have moving parts, that is, shake-able, breakable parts – not the best choice for people who want a portable MP3 player for working out. Hard drives also take up a little more space, so the MP3 players won't be quite as slim and light as others.

Flash-Based MP3 Players

Flash-based MP3 players feature flash memory, which has no moving parts. Flash MP3 players are light-weight and slim (perfect for the gym or a jog), but flash-drive MP3 players have smaller capacities. Their highest capacities max out at about 8GB, which is still plenty of space for most people. Generally, more memory in a portable MP3 player means higher cost. There are plenty of affordable MP3 players between 1 and 80GB.

Understanding Storage Capacities

Before you can really shop for a portable MP3 player you need to know the difference between megabytes (MB) and gigabytes (GB). Memory storage capacities are measured in bytes. More bytes in an MP3 player equal more space to hold all of your songs. A megabyte is 1 million bytes. A gigabyte is 1 billion bytes (and therefore bigger and better). You won't see too many digital MP3 players with capacities measured in megabytes, but there are still a few out there. The table below gives you an approximation of storage capacities in relation to music:

Capacity	# of Songs	Hours of Play
128 MB	60	4
256 MB	100	8
512 MB	250	16
1 GB	Over 500	30+
20 GB (only on a hard drive player)	5000	300+

Battery Type and Life

Generally battery life is viewed as a critical factor in selecting an MP3 Player. Most hard-drive-based players come with non-removable lithium-ion batteries, which typically last two to four years. Many manufacturers have some sort of return/repair plan, so check the warranty policy before you buy. Flash MP3 players are split between those using AA or AAA batteries and those with an internal rechargeable cell. Since flash players need to be synced more often and it's easy to recharge as you sync, flash players with rechargeable batteries are usually preferable.

*You have to be really careful with power adapters for both car power ports and wall plugs. Use only those provided by the manufacturer; even if the plug physically fits, you still need to confirm the adapter's polarity, voltage, and amperage. While amperage can usually be 20 percent less or up to 100 percent more than what's needed by the player, polarity and voltage must be identical to the unit's requirements. If you're unsure about these factors, skip the bargains and buy the power adapter sold by the manufacturer--you'll avoid frying your player.

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Audio Formats

Songs and other audio files can be saved in a variety of file formats, some higher quality than others; MP3 is the most common (hence the term "MP3 player"). Different online music stores may use different formats. While most MP3 players are compatible with most formats, you should check before you buy. The most common formats you need to be aware of are: MP3, AA, WAV/AIFF and WMA. One special note on formats: Songs in the AAC (Advanced Audio Coding) format are copyright protected.

With an MP3 player, you have to consider where your music is coming from to ensure your device will play your music. Here's what you need to know about music compatibility:

Existing music on your computer

If you've already ripped and/or downloaded lots of music, choose a player that supports the format(s) you're already storing. If it's MP3, you're OK with any player, but rarer formats are supported by only certain devices.

Compact discs

If all of your music is still on CDs, you can buy just about any MP3 player since you'll first need to convert your discs to MP3, WMA, OGG, or one of the other common formats.

Online music stores

If you plan on buying music downloads from an online music store you need to make sure your player will work with the formats offered. In an ideal world, you'd be able to play any legally purchased music on any MP3 player, but due to format wars and DRM (Digital Rights Management), that's not possible. If you know you're going to buy tunes online, you'll first have to select a store you like, then a player that supports the store. The files sold by these stores come with usage restrictions that commonly limit playback to three computers and stop you from mass-producing burned mixes. These restrictions can cause device compatibility problems, but the trade-off for consumers is that those safeguards make the labels comfortable enough to license their songs to online stores.

Subscription-based music services

You can legally fill up your MP3 player with endless gigabytes of tunes from an online music store and pay less than the price of a CD. How is this possible? Well, you're not actually buying the tracks; instead, you're renting them in an all-you-can-eat scenario for a monthly subscription fee.

P2P networks


Most tunes available on file-sharing networks (also called peer-to-peer or P2P networks) are already in the MP3 format, so there are no compatibility issues in this situation. Since someone else did the encoding, however, the audio quality of files on these services varies. Also, the legality of these sites is seriously questionable, so there's a risk of getting in trouble with the RIAA, which could lead to hefty fines or even jail time.

Vinyl/cassettes

If you have lots of music on vinyl, cassettes, or even 8-tracks, you can record it on to your computer, turn the files into MP3s, then transfer those to any MP3 player. In order to simplify the process, consider buying a player that has line-in recording and allows you to encode MP3s directly from your stereo. If your stereo has a digital optical output and you want to record MP3s this way, make sure to find a player that has a digital optical input; this will preserve sound quality during the recording process. If there's no digital optical output on your stereo, any player with an analog input will do.

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Key Features of MP3

File Management	Transfer Speed/Port Type	Software
<p>MP3 files include ID3 tags that list the artist, track, album name, genre, and more. Working with this data, a player can organize the files for you. Most hard drive-based players sort files into artist, song title, and genre lists, and can read playlists that you create with software. You obtain song information easily via software enabled to work with an online track-listing database, or you enter the info manually. Look for an easy-to-read LCD screen that shows the information you frequently use.</p>	<p>Most players today use the USB 1.1 interface, but downloading one 5GB batch of songs from your PC can take all night. Look for players that employ the much faster USB 2.0 standard. With FireWire you can transfer an entire song in seconds, but few PCs have a FireWire port. (You can add a FireWire PCI card to your PC for a small fee.)</p> 	<p>All players come with software that allows you to download songs to them. Some of the more popular units have drivers you can use within online music stores and computer software; this permits you to rip from a CD-ROM and download the resulting MP3 file to your player from the same application. Other players come with their own specialized software. And some hard drive-based players appear as a drive within Windows Explorer, so you can drag and drop files into the device.</p>

Additional Features

- **Data storage:** Some MP3 players also serve as data storage, so you can transfer other types of non-music files between computers.
- **Photo viewing:** If you are a photographer, or if you just like to share your family pictures with everyone, you need an MP3 player with photo viewing capabilities. If you have a lot of high-resolution photos, get something with a lot of memory, like a 20GB MP3 player.
- **Recording:** Some MP3 players feature digital voice recorders, which are great for recording lectures or personal reminders, but not music. If you want to record music, get something that has an audio input jack, so you can record directly from other devices.
- **Video playback:** Most portable MP3 players with video playback are great for watching short clips and maybe a digitized TV show or two. They're probably not the best for watching feature films, however, because the screens are too small.
- **Wireless capability:** Many of the newer MP3 players are able to transfer songs and files wirelessly. Just make sure your other devices use the same wireless technology so they are compatible.
- **Hold switch:** If you're like most people, you'll be storing your digital MP3 player in your pocket or backpack. That means you may inadvertently bump a button now or then, which could potentially waste valuable battery life or skip to then next song before you're ready. A hold switch will make that less likely to happen, essentially making the MP3 player controls ineffective until you release it.
- **Expandability:** More and more MP3 players feature memory expansion slots, where you can insert flash memory cards. This can be handy for transferring files, or for listening to a few songs once or twice that you don't want taking up space on your MP3 player
- **Radio:** Many players offer FM radio reception, although they're more common on flash devices, which lack the spinning hard drives and the CD-playing features that can interfere with the signal. Other radio-related features include FM recording (usually to MP3), transmission (for playing back audio wirelessly through home and car stereos with FM tuners), and presets.
- **Personal information management:** Some MP3 players can accept phone books and schedules. The information is generally entered into Outlook or another PIM program, then synced to the device where you can view it but not change it on the go.
- **Sound-tweaking options:** Digital signal processing (DSP changes a song's equalization or spatial characteristics. Since digital audio files come from multiple sources and people have individual sonic preferences, EQ and other DSP settings can be useful. Look for a customizable EQ setting (the more bands the better; five is the norm), as well as the standard presets (Rock, Jazz, Bass Boost, and so on).
- **Advanced playback features:** Just about every player offers shuffle, repeat, resume, and playlist functions. Still, there's room for improvement. Newer models offer the ability to create on-the-fly playlists without a computer; smart playlists; song-rating methods in which preferred tunes appear more frequently in Shuffle mode; automatic cross-fading that adds smooth transitions between songs; and automatic volume control, which makes all songs equally loud.

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Meeting Your Needs

Below is a listing of some of the most common uses of MP3 Players with information on the best players to meet specific needs. If you truly need a player for more than one of the common uses, you might consider buying an additional player. For instance, you might want an ultra-compact flash player for jogging or skiing and a high-capacity hard-drive-based device for traveling. Most people just want an MP3 player for general, day-to-day use – in that case, buy a quality product in your price range with the features you want.

Commuting

You listen to your stereo at home and to your computer at work, but filling your commute with tunes requires a portable player. If you commute by car, look for a hard-drive-based model; size doesn't matter much in this situation, so feel free to save money by buying a heftier unit. You'll also need a cassette style adapter and a cigarette-lighter charger. The former can be purchased anywhere, but for the charger, stick with manufacturer-approved accessories; that way, you'll avoid frying your player with the wrong voltage or polarity. If your car has no cassette player, you're going to need an FM transmitter device or a direct line-in jack on your car stereo. If you commute via subway or bus, look for a compact flash-based player and, to seal out as much of the din as possible, a pair of noise-canceling or sound-isolating headphones.

Traveling

If you spend a lot of time on the road, you need an MP3 player that will enhance your journeys with music yet doesn't add undue weight to your carry-on. If you travel with the same laptop that stores your music, a compact flash-based player is the way to go, but if you'd rather leave the laptop at home, try a higher-capacity player that will hold all or most of your music--bonus points for one that has an easily removable and replaceable battery. Accessories worthy of consideration include noise-canceling or sound-isolating headphones for the plane, as well as a portable speaker setup for your hotel room.

File Hoarding

If your appetite for digital music has your computer's hard drive(s) bursting at the seams, you fit the description of the file hoarder. While sound quality and features are important to you, what you need most is an enormous capacity: at least 40GB but maybe even more. It shouldn't be difficult for you to find a hard-drive player with enough storage to suit your needs, but it may be more expensive and larger than other options.

Working-Out

If you want an MP3 player for working out – it should be compact and easy to operate with one hand. Rather than looking for one with massive storage, choose a flash-based model that can withstand tough workouts better than hard-drive-based players. You may also want an armband, an option on many ultra-compact models, and a set of headphones that will stay in place rather than the cheap earbuds typically included. Also, look for sweat-resistant models and other fitness-friendly extras, such as a calorie counter or pedometer.

Listening to Audiobooks

MP3 players have quickly become the medium of choice for listening to audiobooks. Compared to CD and cassette players, an average MP3 player is small and has the capacity to hold many hours worth of audio. If you're looking to purchase an MP3 player that works well with audiobooks, there are a couple things to keep in mind. The first is whether it's compatible with popular audiobook sites. The second is if the player has bookmarking, that will keep you from having to fast-forward through files.

Recording Audio

Some players on the market can record from line-level sources such as CD players or stereo outputs, so they're great for converting CDs, tapes, and vinyl records to digital formats such as MP3, WAV, or WMA. Those wishing to record live audio can do the same, although they'll need a powered microphone that can output a line-level signal. If voice recording is all you need, look for a model with a built-in mic.

Watching Video

Nowadays, many MP3 players and portable video players (PVPs) come all in one, as the majority of devices hitting the market include video playback as a feature. MP3 players with relatively large screens make the best substitute PVPs--make sure you look for those that are at least 2-inches diagonal.

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Accessories

There are many optional items you can purchase to enhance your player:

- FM transmitters
- MP3 car chargers
- In-line remote controls
- Jogging kits
- Deluxe carrying cases
- Flash memory adapters
- Flash memory
- Docking stations
- USB/FireWire kits
- Extra rechargeable batteries
- Cassette adapters

Just to name a few! You might also consider a higher quality set of headphones. Often, the headphones included with MP3 players are not the highest quality, and they are usually ear buds, which can be uncomfortable for some people. If your MP3 player has wireless capabilities, you can try some wireless headphones. You can also get some noise isolating headphones or wraparound buds that stay on while you bounce around working out.

Refurbished MP3 Players

New MP3 players don't always have to be new or expensive. If you want to save money on a quality digital music player, you should think about getting a refurbished MP3 player. These are players that have been lightly used or demoed before being factory reconditioned to like-new condition. Nobody will know it was a discount MP3 player because it looks and performs like a brand new one.

The best buy on an MP3 Player will be the one that meets your needs with the features you want at an affordable price.

Remember to consider:

- Storage Capacity
- Battery Type
- Compatible Audio Formats
- Key and Added Features
- Intended Use
- Available Accessories
- Price



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Trail Foods

If you are planning a hiking, camping, or backpacking trip you will need to plan which foods to take along. You can use a lot of energy when taking part in these activities, so you will need to think carefully about the foods you plan for your trip.

Carbohydrates come in two basic forms: complex and simple.

- Complex carbohydrates will provide you with energy over a long period of time. Whole foods with complex carbohydrates like whole grain breads, pastas and cereals and other whole grain snacks provide long term energy.
- Simple sugars will provide you with fast energy, but your body will burn them quickly. Chocolate, candy and powdered drinks are examples of simple sugars. Simple sugar foods are ok for a quick pick me up, but plan to choose more nutritious foods for the long run.

Protein foods provide more energy over a longer period of time. Your body burns proteins more slowly than carbohydrates. Protein foods include nuts, beans and meats, fish and poultry. Protein is vital for muscle and tissue repair, which is necessary for an active lifestyle.

There are eight criteria for choosing foods for the trail.

1. They must be easy to prepare. You won't have room to bring along a lot of tools for cooking so they must be simple.
2. The second is to keep your budget in mind when preparing food. You can plan menus for the least cost while still getting the nutrients you need along with great taste.
3. Another criterion is to make sure your food is non-perishable. You will have no refrigeration on the trail so take foods that don't have to be kept cold or that won't spoil easily.
4. Including food from a variety of the MyPyramid food groups will provide you all of the nutrients you need for a healthy lifestyle.
5. Choose foods that taste good to you. The better they taste to you the more likely you will be willing to eat them to get the energy you need.
6. Since you will have a lot of physical activity on your journey, choose foods that will give you the energy you need to keep up to others on the trail. Foods high in energy will meet your exercising needs.
7. Think about how much space the food might take up in your backpack and how heavy the food will be to carry when planning foods for the trail. You don't want to worry about having to carry a lot of weight either in your backpack or on your bicycle.
8. Finally think about packaging. You might not have places to throw out your garbage. Fruits are biodegradable and animals will eat the leftovers. Plan for foods and packaging that will not harm the environment. Fruits are a good example of a food that will either be eaten by animals or will break down in the environment. Also plan to take food out of store packaging and repack it in plastic storage bags. The plastic storage bags are lightweight and can be stored in your pocket or backpack until you get home and they can be disposed of properly.

Always remember to bring along enough water. Plan for 3-4 quarts of water per person per day.

According to the Outdoor Adventures 4-H project the following foods are good choices to take out on the trail. They are light weight and will not spoil quickly. They are high in the nutrients you need each day and give you energy.

Protein Rich Foods	Carbohydrate Rich Foods
Peanut butter	Bagels
Cheese	Crackers
Powdered eggs	Pita bread
Jerky	Mountain bread/flour tortillas
Beans and legumes	Pasta
Canned chicken and tuna	Oatmeal
	Fresh fruit

Nuts and seeds (contain a healthful balance between carbohydrates, fats and protein)

Fat Rich Foods	Carbohydrates-simple sugars
Cheese (also good source of protein)	Hard candies
Oils	Chocolate
	Powdered drink mixes like lemonade

Important Note:

There are many people who have nut and peanut allergies. Make sure the foods you bring along contain no nuts or peanuts or have not been processed with nuts. Read the food labels to make sure there are no references to peanuts or nuts like walnuts, cashews, almonds, or pecans.

Energy Drinks 101

*Carol W. Turner, Food & Nutrition Specialist
Updated from UC Davis materials*

What are energy drinks?

The term “energy drinks” refers to beverages that contain caffeine in combination with other ingredients such as taurine, guarana, and B vitamins, and that claims to provide energy or other benefit to those who drink the product. This term was created by beverage companies and is not recognized by the United States Food and Drug Administration (FDA) or the United States Department of Agriculture (USDA).

Is there evidence that these energy drinks increase energy?

There is limited evidence that consumption of energy drinks can significantly improve physical and mental performance, driving ability when tired or decrease mental fatigue during long periods of concentration. Unfortunately, it is not clear if these improvements are due to the caffeine, other herbal ingredients, or a combination of both.

Can consumption of energy drinks harm you?

The caffeine content of a single serving of energy drink (8 to 12 fl oz) can range from 72 to 150 mg. The problem is that many of these products contain more than one serving so the caffeine content may be as high as 294 mg per bottle. In comparison, the caffeine content, per serving (8 fl oz.), of brewed coffee, tea, and cola beverages ranges between 134-240 mg, 48-175 mg, and 22-46 mg respectively. Most adults can safely consume up to 400 mg caffeine daily. Women of childbearing age should limit their daily consumption of caffeine to a maximum of 300 mg per day and children should limit their consumption to 5.5 mg/pound of body weight. Adolescents should limit caffeine consumption. Intakes greater than 100 mg/day has been associated with elevated blood pressure. Based on this information, consumption of energy drinks by pregnant or nursing women, adolescents, and children is not recommended.

Caution is warranted even for healthy adults who choose to consume energy beverages. Consumption of a single energy beverage may not lead to excessive caffeine intake; however, consumption of two or more beverages in a single day can. Other stimulants such as guarana, ginseng, yerba mate, kola nut, green tea extract, and bitter orange are often added to energy beverages and can enhance the effects of caffeine. Guarana, in particular, contains caffeine (1g of guarana is nearly equal to 40 mg caffeine) and may substantially increase the total caffeine in an energy drink. Adverse effects associated with caffeine consumption in amounts of 400 mg or more include nervousness, irritability, sleeplessness, increased urination, abnormal heart rhythms (arrhythmia), decreased bone levels, and stomach upset.

Furthermore, it should be noted that energy drinks contain added sugar. According to the USDA Dietary Guidelines, sugar should be limited in the normal daily diet

What is the caffeine and sugar content of energy drinks?

Drink	Serving (fluid oz.)	Servings per container	Sugar per serving (g)	Caffeine per serving (mg)	Calorie
Diet Rockstar Energy Drink™	8	2	0 g	80	10
Full Throttle™	8	2	29 g	72	111
Go Girl Sugar Free™	12	1	0 g	150	3
Lo-Carb Monster XXL™	8	3	3 g	80	10
Monster Energy Assault™	8	2	27 g	80	100
Monster Energy XXL™	8	3	27 g	80	100
Red Bull Sugar Free™	8.3	1	0 g	80	10
Red Bull™	8.3	1	27 g	80	110
Rockstar Energy Drink™	8	2	30 g	80	130
Rockstar Juiced™	8	2	21 g	80	90
Wired 294 Caffeine™	8	2	26 g	147	100

Note: This table does not include amounts of other stimulants found in energy drinks that can enhance the effects of caffeine.

There are many unusual ingredients in energy drinks. What do they claim to do?

Ingredient	Found In	Functional Claims
Carnitine	Monster™, Rockstar™, Full Throttle™	Improves endurance, increases fat metabolism, protects against heart disease
Glucuronolactone	GoGirl Sugar Free™, Red Bull™, Monster™	Promotes excretion of toxins and protects against cancer
Guaana	Inositol™, Rockstar™, Full Throttle™	Increases energy, enhances physical performance and promotes weight loss
Inositol	GoGirl Sugar Free™, Red Bull™, Monster™, Rockstar™, Wired B ₁₂ Rush™	Decreases triglyceride and cholesterol levels, lowers risk of heart disease
Panax Ginseng	Monster™, Rockstar™	Speeds illness recovery; improves mental and physical performance; controls blood glucose, and lowers blood pressure
Super Citramax	GoGirl Sugar Free™	Suppresses appetite, resulting in weight loss
Taurine	GoGirl Sugar™, Red Bull™, Monster™, Rockstar™, Full Throttle™	Lowers risk of diabetes, epilepsy, and high blood pressure
Yohimbine HCL	VPX Redline™	Promotes weight loss

Is there scientific evidence to support these claims?

Ingredient	Scientific Evidence
Carnitine	There is no clinical evidence that carnitine use is effective for increased endurance or weight loss, but it may protect against heart disease.
Glucuronolactone	Scientific evidence does not exist to support claims regarding glucuronolactone.
Guaana	A major component of guarana is caffeine. Caffeine consumption has been associated with increased energy, enhancement of physical performance, and suppressed appetite.
Inositol	Scientific evidence does not exist to support claims regarding inositol.
Panax Ginseng	Scientific evidence does not exist to support claims regarding panax ginseng.
Super Citramax	There is scientific evidence that use of this supplement decreases food consumption.
Taurine	Clinical evidence is insufficient to show that taurine is effective in treating diabetes or epilepsy, but it may lower blood pressure.
Yohimbine HCL	Currently no evidence exists to support the claim that use of Yohimbine HCL leads to weight loss .

Is consumption of these ingredients safe?

Ingredient	Safety
Carnitine	Insufficient data exists to establish the safety of carnitine use.
Glucuronolactone	Insufficient data exists to establish the safety of glucuronolactone use at the concentrations found in energy drinks.
Guaana	This substance is generally regarded as safe (GRAS) by the Food and Drug Administration Center for Food Safety and Applied Nutrition (FDA CFSAN).
Inositol	Inositol is generally regarded as safe (GRAS) by the Food and Drug Administration.
Panax Ginseng	Insufficient data exists to establish the safety of panax ginseng use.
Super Citramax	Insufficient data exists to establish the safety of super citramax use.
Taurine	Insufficient data exists to establish the safety of taurine use.
Yohimbine HCL	Approved for use by the FDA to treat hypertension, but over the counter use is not recommended.

Should energy drinks be consumed before or during exercise?

Caffeine is known to increase endurance and its use was banned by the International Olympic Committee. Red Bull was banned in Norway, Uruguay, and Denmark, as the result of an 18-year-old athlete who died hours after drinking four cans prior to an event in 2000. Although the FDA limits the caffeine content in soft drinks to 71 mg per 12 ounce can, energy drinks are designated as dietary supplements, and are not limited in their caffeine content.

Should children and adolescents consume energy drinks?

A recent survey of 78 youth (11-18 years) found that 42.3 percent of participants consumed energy drinks. The effects of ingredients found in energy drinks has raised concern for children and adolescents. In adolescents, caffeine consumption has been associated with an increase in blood pressure. Based on the limited data regarding safety, it is not recommended that children or adolescents consume energy drinks.

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All fluids are not created equal....

As consumers become more conscious about the significant role that food plays in keeping them healthy, they often search for products that promote wellness and provide prevention against diseases. Functional food products are becoming increasingly popular due to this perception by consumers. The beverage industry has not wasted much time in capitalizing upon this consumer trend and has responded to this demand by creating health-promoting functional beverages which fit neatly into the healthiness-on-the-go market. According to Beverage Marketing Corporation, functional beverage sales in the U.S. have tripled over the past five years, with sales in 2007 totaling \$9.8 billion. Ready-to-drink noncarbonated beverages showed a 13% growth while soft drinks reported a 3% decline during this same period.

Functional Beverages

A functional beverage can be defined as a drink product that satisfies thirst, is non-alcoholic, is ready-to-drink and includes in its formulation non-traditional ingredients, such as herbs, vitamins, minerals, amino acids or additional fruit/vegetable raw ingredients, depending on the purpose it is designed for.

Sports and performance drinks, energy drinks, ready-to-drink teas, enhanced fruit drinks, soy beverages, and enhanced water, among others, are some of the product segments under the functional beverages umbrella in the market place. Popular ingredients in functional beverages include caffeine, green tea, yerba maté, vitamin C, schizandra, açai, ginger, cranberry extracts, and ginkgo biloba.

Enhanced waters are also surging in popularity, with a number of formulations labeled with catchy names and slogans with images of health and tranquility. Soft drinks are even branching into the functional market with vitamin-enriched colas.

But consumers should think twice before sipping drinks that promise to "enlighten your senses" or "sharpen your mind." While some functional beverages may provide hydration, many may not address the major health issues today such as obesity, heart disease, and cancer. Most people do not benefit from low levels of vitamins and minerals found in many of these beverages. Typically functional beverages do not capitalize on recognized short fall nutrients like calcium, potassium, folate, and vitamin D but add B vitamins and vitamin C because they are water soluble and can be added without significantly changing the taste.

Functional beverages are often very expensive, usually double that of soft drinks or bottled water. These beverages also add extra calories to one's diet. For example, one popular energy drink contains 130 calories and 34 g carbohydrates in an 8.3-ounce serving – this is higher than colas. Other products contain ingredients that have not been sufficiently studied for health benefits, safety, and dosage. Caffeine content can also be high in these products. Caffeine content of caffeinated energy drinks ranged from 0 – 141 mg/serving. An average 8-ounce cup of coffee contains 133 mg of caffeine.

The Food and Drug Administration (FDA), which regulates the claims food and drink makers can put on their labels, does not require companies to seek approval for claims before the products reach store shelves. Specific health claims of links between a product and disease or about how a nutrient affects functions of the body are supposed to be

backed by scientific evidence. However, the FDA cannot get involved until after the product is available to consumers and questionable claims have been made. The FDA is currently reviewing its regulation of functional foods.

The point of drinking any fluid is to rehydrate the body. Tennis players can lose as much as two quarts of water an hour, and a professional football player working out in August can lose a quart and a half. Water works best to replace those fluids, but sometimes athletes want more.

WATER

Water has historically been considered the best choice of fluids for athletes. Research has shown that during 1 hour of cycling in the heat, high water intake (1.3 Liters or 5 ½ cups) improved performance 6.5% more than lower water intake (200ml or about ¾ cup). However, adding carbohydrates (6-8%) to the 1.3 Liters of water improved performance another 6.3%. Water is a good fluid replacement during exercise for the majority of athletes, especially those who compete in events of short duration (less than 1 hour of intense exercise at a time) where they can replace fluids during the event. Refillable water bottles and jugs are available, making water a relatively inexpensive beverage choice. Commercially bottled water in individual servings is also available, which is a little more costly but might be more convenient, depending upon the situation. When choosing between bottle or tap water both are safe and equal in nutrition, but tap water may have more fluoride. Cooling water (to about 50-59 degrees F) improves the taste to many people and water of this temperature may get out to the muscles of the body faster, cooling the body more quickly.

100% FRUIT JUICE

100% fruit juice is very nutritious. It provides the same vitamins and minerals naturally found in fruit, although juice is a little lower in fiber. 100% fruit juice is a nutritious beverage choice. However, because of the high amount of naturally present sugar (usually about 12% carbohydrate, or 29 grams per 8 oz.), it may cause stomach distress and impair exercise performance. If used as a fluid replacement for an athlete, juice should be diluted (half water, half juice). 100% fruit juice is often available in single serving containers. Labels should be read to insure that the product is 100% juice. Juice should be diluted for young children also.

FRUIT JUICE BEVERAGES

Fruit juice beverages, fruit juice drinks, fruit punch and fruit “ades” are not the same as 100% fruit juice. These fruit drinks usually contain water, calorie-containing sweeteners, colors and flavoring. Some fruit juice (often as little as 10%) is usually added along with vitamin C. Label claims, such as “Made with real fruit juice,” should be investigated to determine how much fruit juice is actually in the product. Fruit juice beverages are usually less expensive than 100% fruit juice. They may be sold as powdered drink mixes or as ready-to-drink products. Carbohydrate content is generally the same as fruit juice, about 12% (29 grams per 8oz.), which is an amount high enough so that it may cause stomach distress and impair exercise performance. If used as a fluid replacement for athletes, fruit juice beverages should be diluted (half water, half juice).

SODAS

Sodas are carbonated soft drinks (nonalcoholic beverages) made from water, sweeteners, flavorings, colors, acids and carbon dioxide. The calorie-containing sweeteners most often used are sugar and high fructose corn syrup. The non-nutritive sweeteners on the market today used in soft drinks, with table top version listed in parentheses, include aspartame (Equal or Nutrasweet), sucralose (Splenda), acesulfame potassium (Sunette) and saccharin (Sweet'n Low). All of these non-nutritive sweeteners have been approved by the Food and Drug Administration (FDA). Caffeine, a stimulant, is present in some sodas and must be listed as an ingredient if it is added. It is naturally present in the cola nut, which is what colas are made from.

Although sodas are popular, they have no nutritional value except for providing fluid and energy from carbohydrates when it is used as the sweetener (generally sucrose and high fructose corn syrup). The calories that soda provides are considered empty calories because few, if any vitamins or minerals are present. Soda manufacturers have begun trying to increase the nutritional value of some products by adding vitamins and minerals. The carbohydrate content of sodas, which contain caloric sweeteners, is about the same as fruit juice, about 10-12% (38 grams per 12oz.). This is an amount high enough to potentially cause stomach distress and impair exercise performance for the athlete. Diet soft drinks contain little, if any, carbohydrates. However, stomach discomfort due to the carbonation in sodas could result.

SPORTS DRINKS

Sports drinks are made of water, mineral salts (mainly sodium and potassium) and calorie-containing sweeteners (usually sugar or high fructose corn syrup). They have approximately 50-75 calories, 80-110mg of sodium, and 30-45mg of potassium per 8 oz. serving. Sports drinks generally do not contain vitamins or protein. Gatorades and PowerAde are two common sports drinks, although other brands, including generic and store brands, may be available. They are packaged in ready-to-drink, single serving bottles ranging from 8 to 32 ounces and ready-to-mix powder. The carbohydrate content is usually 6-8% (14-18 grams carbohydrate per 8 oz.) an amount that studies have shown is well tolerated in the heat and improves endurance when physical activity is for an hour or more. A recent study showed that consuming 1.3 Liters (about 5 ½ cups) of water alone improved performance during one hour of cycling, but when 79 grams of carbohydrate were added, performance improved even more.

TEA

Sweet tea contains about the same amount of sugar as soda. Regular sweet tea and diet sweet tea are available in single serving bottles and cans and in larger containers ready-to-drink. Tea bags and tea leaves are available for those who like to brew their own tea and powdered tea mixes, with and without sweetener, are also popular. A caffeine-like stimulant is naturally present in tea, so it should be assumed that the product has caffeine unless it is labeled as "decaffeinated." In the South, sweet tea typically contains at least as much sugar as soda, about 10-12% carbohydrate (38 grams per 12 oz.). This is an amount high enough to potentially cause stomach distress and impair exercise performance for the athlete.

Unsweetened tea or tea sweetened with non-nutritive sweeteners does not contain carbohydrates. Regular and decaffeinated tea contains natural antioxidants called flavonoids. However, tea is not a substitute for fruits or vegetables, which provide a wider range of antioxidants, along with vitamins and minerals. The potential health benefits of tea are the focus of many scientific studies. However, it is too early to draw any conclusions about tea's contributions to health.

FLAVORED WATER

Flavored waters or fitness waters are relatively new to the marketplace. Dasani Flavored water, Sam's Choice Clear American, Propel, Fruit20 and others are available in various fruit flavors. Most flavored waters contain one or more non-nutritive sweeteners such as sucralose (Splenda), aspartame (NutriSweet or Equal), and acesulfame potassium (Sunette). Sometimes sucrose (table sugar) is also in the sweetening blend, in which case the product will have some calories from carbohydrates. Some brands also have vitamins and minerals added. In general, flavored waters provide an additional category of beverage choices with the benefits of plain water.

MILK

Like all beverages milk is a source of water. Milk is approximately 89% water. It is also one of the best sources of calcium in the American diet. Along with water, milk supplies us with many essential nutrients; including calcium, vitamin D, Vitamin A, Protein, Potassium, Riboflavin, Vitamin B₁₂, Phosphorus, and Niacin. Fat and calorie content differ between the various types of milk from skim to whole, but the other nutrients are about the same. MyPyramid, suggest 3 cups of milk or low-fat dairy product for every person each day. The protein and calcium in dairy products is especially important for the athlete as they work to build strong muscles and bones.

Hydration Before, During and After Exercise in the Heat

It is important for athletes to make sure they drink plenty of fluids, beginning several days before an event. The extra water is not stored in the body, but it enables the body to be fully hydrated at the start of the event. According to an article in The Physician and Sports Medicine, drinking about 2 cups (16 oz.) of fluid 2 hours before an event may help keep athletes from becoming dehydrated. However, those participating in sports where a great deal of running is involved may find this uncomfortable, so it should be practiced in training sessions.

Drinking fluids during exercise in the heat reduces dehydration, body temperature and strain on the heart. It can also increase performance. The amount needed varies because of individual differences. General recommendations range from 5-10 oz. of fluid every 15-20 minutes during heavy exercise. If the exercise is for longer than one hour, fluid with 6-8% carbohydrates may be beneficial for endurance. In addition, ultra endurance athletes (events lasting 4 hours or more) should consume food or fluid containing carbohydrates, sodium and other electrolytes during and after the event. The amount of fluid which individuals should replace after exercise varies a great deal from person to person. The best way to determine individual fluid replacement needs is to weigh before and after exercise, keeping everything else the same (clothing, shoes, etc.) Replace every pound lost with 1 pint (16 oz. or 2 cups) of fluid (a pint, a pound). Research indicates that sodium is important for fluid restoration after exercise. Most

physically active people do not need to replace the minerals lost in sweat immediately. A meal eaten within a few hours of competition can replace these minerals soon enough for most people.

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Adapted from “Fluid Tips For The Active Person: Comparing Sports Drinks” by Gail M. Hanula, EDs, RD, LD, Extension Nutrition and EFNEP Specialist. Reviewed by: Kelly Cordray, MS, RD, LD, Connie Crawley, MS, RD, LD, Extension Nutrition and Health Specialists and Cheryl Varnedoe, MS, Extension 4-H Specialist. July, 2005

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