

FIT SOCIETY®

PAGE

A Quarterly Publication of the American College of Sports Medicine

ARE YOU READY TO EXERCISE?

how to start an exercise program

by Lisa K. Lloyd, Ph.D.



If you are like most people, starting an exercise program may seem intimidating, time consuming, and difficult. However, the fact that you're reading this article shows that you've already begun to commit to exercising. There are lots of good reasons to exercise, such as improving physique, losing weight, increasing physical fitness and improving your health (reducing the risk of heart disease, adult-onset diabetes and certain forms of cancer). Though many people are aware of the benefits of exercise, few are familiar with the proper guidelines regarding the quantity and quality of exercise. This is important because one of the keys to beginning a successful exercise program is to follow exercise guidelines that have been proven safe and effective in meeting people's health and fitness goals. In general, an exercise program should include a variety of physical activities that will improve cardiorespiratory endurance, muscular endurance and strength, flexibility, and body composition.

Cardiorespiratory endurance refers to the body's ability to deliver oxygen and nutrients to and remove wastes from tissues over sustained periods of time. Good cardiorespiratory endurance indicates that you are at reduced risk for developing heart and lung disease. In order to enhance cardiorespiratory endurance,

the American College of Sports Medicine (ACSM) suggests that aerobic activities should be performed three to five times each week for 20–60 minutes at an intensity that is equivalent to 65 percent to 90 percent of your maximal heart rate. Aerobic activities include walking, jogging, in-line skating, dance aerobics, swimming, cross-country skiing, and bicycling. Calculation of 65 percent and 90 percent of maximal heart rate involves the following three steps:

1. Max HR = 220 - [your age] = ____ beats per minute
2. 65% of Max HR = 0.65 x [max HR] = ____ beats per minute
3. 90% of Max HR = 0.90 x [max HR] = ____ beats per minute

For instance, by following these three steps, 65 percent maximal heart rate for a 32-year old person would be 122.2, whereas 90 percent maximal heart rate would be 169.2. Therefore, this person should perform an aerobic exercise hard enough that his or her heart rate reaches at least 122 beats per minute, but not perform the exercise so hard that the heart rate exceeds 169 beats per minute.

Muscular strength refers to the ability of a muscle, or a group of muscles, to exert force over a brief period of time. Muscular endurance, however, refers to the

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Letter from the Editor

Welcome to the summer issue of the *ACSM Fit Society*® Page. The American College of Sports Medicine recently completed its 48th Annual Meeting, and it was a tremendous success. ACSM members from around the world presented new and exciting information about exercise and sports medicine. Some of that information is contained in this issue of *ACSM Fit Society*® Page.

With summer here, active people need to think about dealing with the heat for outdoor exercise and recreation. Several articles in this issue address specific concerns related to body temperature regulation and dehydration. This is important because increases in body temperature and loss of body water can lead to serious health problems. For those of you taking advantage of the long summer days to begin an exercise program, we have included information that may help make your start easier and more enjoyable. As always, we have the Athlete's Kitchen and our ever-popular Question and Answer section.

We hope you enjoy this issue of *ACSM Fit Society*® Page and find information that you can use to enhance you and your family's health and wellness. If you have any questions or comments please be sure to contact us.

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Q&A with ACSM

by Bryan W. Smith, M.D., Ph.D.

Q: What are some tips for parents regarding water safety for children?

A: Have your child learn to swim! However, don't rely on swimming lessons alone to protect your child from drowning. A child may panic, particularly when confronted with an unfamiliar situation, and forget what they have learned. Never leave children alone in a swimming area and never take your eyes off your child while he/she is swimming. Drowning can be quick and silent. In all boating situations, children should wear approved life jackets, even when sleeping. Learn CPR!

Q: At what age should you have your child take swimming lessons?

A: By age four, most children have the motor skills and attention span necessary for organized swimming. They are more likely to be interested as well.

Q: What are some tips to prevent heat illness?

A: Optimizing fluid intake by consuming eight to 16 ounces of fluid pre-exercise and six–eight ounces of fluid every 15 minutes during exercise. Taking 10–14 days to acclimatize for children and seven to 10 days for adults. Being well conditioned physically. Wearing the appropriate light-colored clothing. Avoiding exercise during times of maximal heat stress.

Q: Is taking salt tablets a good idea when training in the heat?

A: With exercise, the majority of the body's sweat loss comes from water. The more trained the person, the more dilute their sweat is. There is no need for salt tablets. However, since our bodies do lose some salt in sweat, these small amounts can be adequately replaced just by using salt with meals.

American College of Sports Medicine

FIT SOCIETY PAGE

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For more information on subjects discussed in this issue and/or a catalog of all ACSM publications, please send a self-addressed, stamped envelope to: American College of Sports Medicine, c/o ACSM Fit Society®, P.O. Box 1440, Indianapolis, IN 46206-1440.

Q: Why are the elderly more prone to heat illness?

A: While both children and the elderly are prone to heat illness, there are different reasons to explain each group's susceptibility. For the elderly, their thirst response is decreased. The elderly have decreased cardiovascular capacity, which is more evident in the less trained individual. Many have a history of chronic medical illness such as hypertension or diabetes and are on many medications that can increase the potential for heat illness such as diuretics, beta-blockers, antihistamines, antidepressants, and anticholinergics. It is important to discuss exercising in the heat with your physician.

Q: What is the optimal fluid for exercising in the heat?

A: This fluid must be readily emptied from the gut into the circulation. Usually for activities of one hour or less, chilled water is optimal. For longer events, a sports drink is preferred.

Commentary



SUMMER EXERCISE TIPS FOR OLDER ADULTS

by Ingrid C. Frey, M.S. and William B. Farquhar, Ph.D.

Now that summer is here, there are some special considerations to take into account when exercising outdoors. These will include some of the following: What effect does high temperature have on my ability to exercise? What is heat injury? What can I do to prevent heat injury? How important is fluid intake during exercise?

Exercising in the heat puts significant stress on your cardiovascular system to maintain core body temperature and fluid balance. As you exercise, most of the energy produced from working muscles generates heat and therefore increases body temperature. This increase in core temperature causes the blood flow to the skin to increase, and stimulates sweat glands. Increased skin blood flow coupled with evaporation of sweat at the skin surface cools the body by allowing heat to be transferred from the core to the skin and to the environment. However, environmental factors such as bright sunlight, high humidity, and lack of wind challenge your ability to dissipate heat to the environment and maintain body temperature. For example, high humidity reduces the evaporation of sweat on the skin surface, thus reducing its cooling effect. Many of these concerns are exaggerated in older adults, particularly less fit adults who are not accustomed to exercising in the heat.

When exercise is performed in hot environmental conditions, an excessive increase in body temperature (hyperthermia) can result in heat injury. Heat exhaustion, one form of heat injury, is caused primarily by dehydration, and less often, salt depletion. Some of the symptoms include chills, nausea, dizziness, and profuse sweating. A more serious form of heat injury, and fortunately less common,

is heat stroke. Heat stroke is a medical emergency requiring immediate medical care and cooling by whatever means possible. Many of the symptoms are similar to heat exhaustion but also may include disorientation, loss of consciousness and seizures. Sweating generally is absent in heat stroke, but the skin may be moist from earlier sweat production.

Certain diseases may impair the ability to regulate body temperature and increase susceptibility to heat injury: high blood pressure, cardiovascular disease, and diabetes can reduce sweat rate and skin blood flow, thereby increasing heat stress during exercise. Some medications taken for these diseases such as diuretics (e.g., furosemide/lasix), beta blockers (e.g., metoprolol/lopressor), vasodilators (e.g., lisinopril/zestril) and others also can impair the ability to regulate body temperature. Be sure to ask your physician if any of the medicines you take affect your ability to exercise in the heat.

Fortunately, following some common sense guidelines can minimize the risk of heat injury. Preventing dehydration not only reduces the risk of heat injury but also leads to improved exercise performance. What is generally not appreciated by recreational and competitive athletes is that even a small (1 percent to 2 percent) reduction in body weight from excessive sweating can lead to impaired exercise performance and can increase cardiovascular strain. Simply drinking fluids when thirsty is never enough to offset the fluid lost during exercise. This has been referred to in the scientific literature as “voluntary dehydration.” This concern is heightened in older adults, where the drive for thirst is even less sensitive. Therefore, proper fluid intake prior to, during, and after exercise is critical in reducing the risk of heat injury and optimizing exercise performance.

The general recommendation is two cups of fluid two hours before exercise and a cupful every 15 minutes of exercise. Importantly, fluid intake during exercise should match sweat rate. For every one-pound reduction in body weight, at least one pint of fluid should be consumed. What is the best fluid replacement? Water is probably most important when exercise duration is less than one hour. However, some find that the increased palatability of various sports drinks helps them to more fully replace the amount of fluid lost during exercise. Fluids cooler than room temperature (59–79 degrees Fahrenheit) also seem to increase palatability. Those who exercise longer than one hour, or exercise very intensely for slightly less than an hour, may benefit from fluids containing carbohydrates and electrolytes.

The majority of heat-related problems occur during the first few exercise sessions in the heat. This highlights the importance of heat acclimation. There are a number of benefits to heat acclimation (including an increased sweat rate) that make exercise in the heat safer and more tolerable. It generally takes 10–14 days to fully acclimate. Continuing to use the same target heart rate training range is recommended and will require that you decrease the absolute intensity of exercise (e.g. walking pace). Shortening the duration of exercise for the first few exercise sessions in the heat also is recommended. Those with a high fitness level acclimate faster and in general can better tolerate heat stress.

Following these guidelines should allow you to minimize the risk of any heat-related problems. Should you experience any of the aforementioned symptoms of heat illness, be sure to immediately stop exercising, find a cool shaded area, and drink plenty of fluids.

Feature



A HOT ISSUE FOR SUMMER EXERCISERS

by Matthew J. Comeau, Ph.D.

As the temperature starts to increase, more and more people move their exercise regimen outside. This can present a problem if the temperature outside is hotter than what an individual is accustomed to. With exercise in a controlled environment, exposure to the stress of heat and humidity is minimal. This could become a major problem to the exercising individual, especially if they are not used to changes in temperature and humidity. Therefore, it is important to identify problems someone exercising in the heat may experience.

Heat Related Problems

Heat-related illness falls into a hierarchy of increasingly problematic categories: heat rash, heat cramps, heat exhaustion, and heat stroke. Anyone is susceptible to a heat-related illness. However, those who are informed and take steps to minimize risk factors associated with heat related problems could greatly reduce their susceptibility.

Those who sweat excessively generally experience heat rash, but any individual can be vulnerable to this condition. Tight fitting and sweat-saturated clothing usually is a great combination for the formation of heat rash. Heat rash will appear as areas of small red pimples or blisters. This condition usually is not uncomfortable, but if severe enough, burning and itching may occur. While this is uncomfortable, it does not present so serious a problem to an individual's health as do the other three heat illnesses.

Heat cramps are associated with excessive sweating during exercise. Cramps usually are caused by the depletion of salt from the body during the sweating process. Involuntary muscle cramping can be painful depending on the severity of the cramp.

Heat exhaustion occurs when body temperature is elevated due to excessive exposure to the heat; its sweating mechanism becomes overwhelmed. A person experiencing heat exhaustion will appear ashen. The skin may become cool and clammy. Dizziness, weakness, and disorientation can accompany pale, cool, and clammy skin.

The last and most severe heat-related illness is heat stroke. An individual experiencing heat stroke will have flushed skin, minimal or no sweating, and skin that feels hot to touch. Confusion and fainting also may accompany the hot, flushed, dry skin. Unlike heat exhaustion, heat stroke is a severe problem and must be dealt with quickly. It can be life threatening.

Recommendations for Decreasing the Risk of Heat Illness

Adequate intake of fluid is the best way to prevent heat illness. However, not all beverages aid the body in replacing lost fluid. Caffeinated beverages should be avoided. These beverages (caramel colored soda, coffee, tea) actually work against the body and cause it to get rid of fluid. Recommended fluids include water, sports drinks, and fruit juices. These allow the body to replenish lost fluid without causing excessive fluid loss. Other methods to decrease the risk of heat illness include becoming acclimatized to the outside temperature, wearing loose-fitting clothing, wearing a hat, exercising in the morning or late evening versus in the middle of the afternoon, and wearing sunscreen to prevent sunburn. Sunburn decreases the body's ability to cool itself. When becoming acclimatized to the outside temperature, one should gradually increase exposure to the outside elements. As air temperature rises, exposure should be increased slowly. It usually takes seven to 14 days to be-

come acclimatized to hot temperatures. Wearing loose-fitting clothing allows more air to pass by the body, thereby allowing for more evaporation of sweat and greater cooling. By wearing a hat, one can limit exposure to the sun and decrease the overall effect of the sun on body temperature. Exercise should occur in the morning or late evening because of the cooler temperatures associated with those times of day. Exercising in the afternoon, especially late in the afternoon, will expose the body to the hottest time of day. Finally, wearing sunscreen will reduce the possibility of sunburn, and not affect the ability of the body to cool itself.

Fluid Intake Recommendations

The following are recommendations for fluid intake when the possibility of heat-related illness is present:

- Two to three hours prior to exercise, drink approximately 20 ounces of water or a sports drink.
- Ten to 20 minutes before exercise, drink approximately 10 ounces of water or a sports drink.
- During exercise, drink at least 10 ounces of water or sports drink every 10 to 20 minutes. Remember not to drink based on thirst alone. It is not the only predictor of decreased fluid levels.
- After exercise, drink approximately 20 ounces of water or sports drink per pound of weight lost during exercise.

When is it too hot to exercise?

There are times when the heat and humidity are so high that exercise should be avoided. The greater the risk for heat illness, the more attention should be given to fluid intake, and the utilization of other precautions.

Heat Index Chart:

<http://weather.noaa.gov/weather/hwave.html>

Starting Exercise

(Continued from page 1)

ability of a muscle, or a group of muscles, to sustain repeated contractions or to continue applying force against a fixed object. Simply put, muscular strength is used to lift heavy objects, while muscular endurance is used to carry groceries from the car to the house. Well-developed muscular strength and endurance can improve a person's body composition and general quality of life, and prevent musculoskeletal injuries, low back pain, and osteoporosis. ACSM suggests that performing one set of eight to 10 exercises targeting major muscle groups (*i.e.*, back, shoulder, chest, abdominal, thigh, hamstring, buttock or gluteal, triceps, biceps, and calf muscles) two to three days each week will enhance both muscular strength and muscular endurance. It is recommended that most healthy young to middle-aged adults perform eight to 12 repetitions of each exercise. For older (50 years of age and above) and more frail individuals, it is recommended to perform 10 to 15 repetitions of each exercise.

Flexibility refers to the ability to move joints and use muscles through their full range of motion. Good flexibility enhances quality of life and reduces risk of musculoskeletal injuries and low back pain. When stretching, one should perform slow, sustained stretches of large muscle groups with minimal or no bouncing. To achieve optimal flexibility, complete at least four repetitions per muscle group of 10 to 30 seconds in duration at least two to three days each week.

Body composition refers to the makeup of body tissue in terms of lean mass (*e.g.*, muscle, bone, vital tissue, and organs) and fat mass. An optimal ratio of fat to lean mass is an indication of fitness, which reduces the risk of chronic diseases and musculoskeletal problems. Combined with appropriate dietary intake, physical exercise training conducted at least three days per week at recommended intensity and duration will expend at least 250 to 300 calories and

increase your likelihood of successful weight loss and long-term maintenance of weight loss.

In conclusion, those who are waiting to "feel" like exercising usually never do. Beginning an exercise program involves a conscious decision to incorporate exercise into one's daily routine, whether you "feel" like it or not. After all, it only takes an hour workout a few days per week to achieve the health-related benefits of exercise. Begin your workout with a five to 10-minute warm-up of light intensity exercise, such as walking and slow jogging, and gentle stretching exercises of large muscle groups. Then perform at least 20 minutes of continuous aerobic exercise and at least 20 to 30 minutes of muscular strength and endurance training. End your workout with a five to 10-minute cool down of slow walking, followed by stretching exercises geared toward increasing your flexibility.

Which School Will Fit All Your Needs?

Two indispensable ACSM references will help you decide:

ACSM's 2001 Directory of Graduate Programs in Sports Medicine and Exercise Science

ACSM's 2002 Directory of Undergraduate Programs in Sports Medicine and Exercise Science

Are you looking for a way to find out exactly which school fits your needs? The American College of Sports Medicine (ACSM) invites you to learn about both undergraduate and graduate programs in the ACSM's 2002 Directory of Undergraduate Programs in Sports Medicine and Exercise Science and the ACSM's 2001 Directory of Graduate Programs in Sports Medicine and Exercise Science.

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Feature



KNOWING RISKS OFTEN PREVENTS SERIOUS SPORTING INJURIES

by Michael R. Bracko, Ed.D., FACSM

There are several factors that can cause sports-related injuries. For someone who exercises for physical or mental fitness, a “fitness athlete,” one of the most prominent risk factors for injury is level of fitness. Generally speaking, the less “fit” a person is, the greater chance he or she has of getting injured.

A beginning exerciser must start an exercise program with low intensity (how “hard” the exercise is), moderate duration (how long the exercise lasts), and moderate frequency (days per week). After three to five weeks of regular exercise, the intensity and duration may be increased, with the frequency staying the same (three days a week). In order to prevent injury in the initial stages of an exercise program, a “fitness athlete” must start “low and slow” (low intensity and slow pace) and gradually increase the amount of exercise.

After two to three months, intensity, duration, and frequency may be increased again according to the person’s age, time constraints, and motivation. But waiting weeks, then months, to increase intensity, duration, and frequency can decrease the risk of injury as well as the risk of dropping out.

Age

Age is a key factor for potential injuries. The older we are, the more susceptible our muscles and tendons are to injuries. An older adult who is starting an exercise program must absolutely follow the guideline of “low and slow” in the initial stages of an exercise program. Even an older “fitness athlete” who has been exercising for a long time must be careful with his or her intensity, duration, and especially frequency, making sure there are days off from exercise.

Men and Women

Differences between men and women in terms of getting injured have more to do with traumatic injuries such as torn ligaments in the knee than muscle/tendon strains or pulls. Generally speaking, men and women and boys and girls must take the same precautions when starting an exercise program.

Individual Behavior

Behavioral risk factors for getting injured include: lack of sleep, emotional stress (a major cause of back injuries), smoking (risk factor for back injuries), fatigue—specifically a lack of muscle endurance, overuse (tendinitis) or too much exercise (not enough days off). Some injuries simply are of unknown cause, and some injuries simply are caused by exercising too hard, too fast, or doing too much.

Stretching and Warm-up?

There is now some controversy over whether stretching before exercise prevents muscle and tendon injuries. It has been a long-standing philosophy that stretching immediately prior to exercise will prevent injuries. However, there is new research with practical application that shows stretching prior to exercise or sports participation may not prevent muscle or tendon injury. The research provides four possible reasons why stretching may not prevent injury:

1. A more flexible muscle and tendon doesn’t mean that it has a greater ability to absorb forces that may cause injury.
2. Many injuries are not caused by “overstretching” the muscles. Injuries can occur within a normal range of motion. Therefore, a more flexible muscle may not prevent injury.
3. Mild stretching has been found to weaken the muscle for about 15 minutes. So stretching, then exer-

cising, may put a person at greater risk for injury.

4. Stretching may increase tolerance for pain — that is, it has an analgesic effect. Therefore, it does not seem prudent to decrease one’s tolerance to pain, weaken the muscle, and then exercise a weakened, anesthetized muscle.

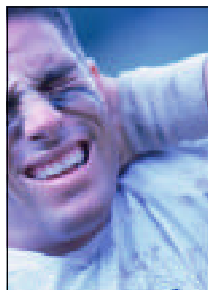
ACSM recommends stretching two to three times a week. Regular stretching can improve other aspects of health, including flexibility. It may be better to gently warm up the body with low-intensity muscle contractions for approximately 10–15 minutes, or until you are sweating, then engage in higher intensity exercise or sport.

Warm-up Routines

- Ten to 20 half squats with no weight, five to 15 push-ups, five to 15 curl-ups, 10 arm circles, 10 heel raises, 10 ankle/toe circles with each leg, 10 hip circles, then slowly run or ride a bike for 10 minutes.
- Weight training: using a light enough weight that you can easily do 10 to 15 repetitions, perform the following exercises: bench press, lat pull-down, shoulder press, seated cable row, five to 15 curl-ups, five to 15 back extensions, squats, leg press or lunges, knee extension, and knee flexion.
- Before running: walk for five minutes, jog for five minutes, then start “running.”

The best way to prevent an injury is to gradually increase your fitness level: warm up the muscles; stretch after exercise; use proper form, especially when weight lifting; get plenty of sleep; decrease the intensity and duration of exercise when under stress; and refrain from smoking.

The Athlete's Kitchen



MUSCLE CRAMPS: DO THEY CRAMP YOUR STYLE?

Nancy Clark, M.S., R.D., FACSM

"I get excruciating cramps when I play tennis in the heat. Could something be wrong with my diet?"

"I cramped so badly during the marathon I had to quit a few yards from the finish line. I just couldn't go any further."

"Should I drink pickle juice to prevent cramps?"

If you've ever experienced the excruciating pain of a severe muscle cramp, you may fearfully wonder if it will strike again. You also may wonder if nutrition imbalances are at the root of the problem and if diet changes would be the simple solution.

Muscle cramps are poorly understood. Historically, no one has been able to predictably cause a muscle to cramp, hindering the ability to study the underlying mechanisms that contribute to these unpredictable spasms. Just recently, researchers found a way to cause cramps. This may open the door for more research on ways to prevent them from happening.

We know that muscle cramps commonly occur among athletes who work their muscles to the point of exhaustion. The overexertion theory of muscle cramps goes like this: When a muscle gets tired, the numerous muscle fibers that comprise the muscle fail to contract in a synchronized rhythm. This likely is related to over stimulation from the nerves that trigger the muscles to contract.

What to do

What should you do if you get a cramp? Popular remedies include massage, stretching, accupressure (relaxing the affected muscle by applying pressure to it), and giving yourself a hard pinch squarely on the upper lip.

What about nutritional remedies? Previous theories have suggested cramping is related to fluid loss and electrolyte imbalance. These theories do not always hold true. For example, musicians, who do not often get sweaty, complain of muscle cramps. Yet, if you are plagued by cramps, you should at least rule out any possible factor that might contribute to getting them. Here are a few food tips to help you rule out theoretical nutritional causes.

Theory #1: Lack of water. Cramps often occur when an athlete is dehydrated. (Although even athletes who are well hydrated get cramps.) To reduce the risk of dehydration-associated cramps, simply drink more than enough fluids before, during, and after you exercise. On a daily basis, drink enough fluids so you have to urinate every two to four hours. Your urine should be pale and copious. During extended exercise, drink as much as tolerated, optimally eight ounces every 15–20 minutes.

Theory #2: Lack of calcium. Calcium plays an essential role in muscle contractions. Anecdotal stories suggest that athletes who eliminate calcium-rich dairy products can become plagued by muscle cramps. For example, a ballet dancer who added yogurt and skim milk back into her diet reports her cramps disappeared. A mountaineer resolved his muscle cramps by taking calcium-rich Tums. Exercise scientists question the validity of these anecdotes, believing a calcium imbalance is unlikely to be the cause of muscle cramps. After all, the bones are a calcium reservoir and can supply what is needed for proper muscle contractions. Nevertheless, to rule out any possible link between a calcium-poor diet and muscle cramps, I recommend that athletes plagued by cramps consume calcium-rich foods at least twice a day, such as low-fat

milk on cereal and yogurt for a snack. This good nutritional practice certainly will not hurt, and may possibly help.

Theory #3: Lack of sodium. Many health-conscious athletes restrict their salt intake on a daily basis, believing this will help prevent blood pressure problems. However, if these athletes are losing a significant amount of sodium through sweat, they may be putting themselves at risk for developing a sodium imbalance that could contribute to cramps. This situation is most likely to occur in extreme sports such as an Ironman triathlon or 100-mile trail run, particularly if the athletes have consumed only plain water (no sodium-containing food or beverage) during the event.

Theory #4: Lack of potassium. Athletes who sweat heavily may lose some potassium, but they are unlikely to become potassium-depleted. And if they did, the whole body would be affected, not just one muscle. Still, eating more potassium-rich fruits and vegetables will hurt no one.

Theory #5: Lack of pickle juice. Some football players and athletic trainers swear two ounces of pickle juice taken 10 minutes before exercise prevents cramps. The reasons are unknown and untested, but there is no harm in trying!

These are only suggestions, not proven solutions. You might want to experiment with these dietary tips if you repeatedly suffer muscle cramps. Adding extra fluids, low-fat dairy products, a sprinkling of salt, extra fruits and vegetables, and even some pickle juice certainly will not harm you and may possibly resolve the worrisome problem. I also recommend you consult with a physical therapist, athletic trainer or coach regarding proper stretching and training techniques. Nutrition may play no role at all.