



Photo by David Huxford

BUILD MORE MUSCLE WITH THIS NUTRITION TRICK

Q What's the best thing for me to eat before weight training?

A If you had asked me that question only four months ago I would have said, "It's not really that important. Just whatever sits best in your stomach." But scientists from the University of Texas and from the French National Research Institute for Nutrition in Paris have made me a smarter man ... and will very likely make you a stronger man.

These researchers have found, in two separate studies, that eating protein within one hour before your workout will not only help optimize fat burning during your workout, but significantly increase muscle protein synthesis after your workout. This is **BIG** news! For so long we have thought that eating your protein immediately after your workout was best, but the research team at the University of Texas decided to challenge this and here's what they found.

They tested six subjects, in a crossover fashion (meaning they tested all both ways) with either a meal of protein and carbs eaten before an exercise bout or immediately after. They found that the uptake of amino acids into the exercised muscles was 2½ times greater when the meal was eaten before the workout versus after. This increased amino acid uptake led to a significant increase in net muscle protein synthesis.

Then the folks in France took it a step further. They tested two forms of pure protein (whey and whole milk protein) against a pure carb meal eaten before exercise. They did this one in rats.

They found that all of the rats gained body weight. But here's the kicker ... the carb- and whole milk protein-fed rats gained it all in fat, while the whey protein-fed rats gained it all in muscle! And on top of that the whey rats burned significantly more fat than the others.

So the take-home message here is ... **drink a pure**

whey protein drink before your workouts and you will recuperate and build muscle faster! My suggestion for which protein product to use would be Precision Protein Ready to Drink. It has 42 grams of pure whey protein isolate, with virtually no carbs.

FUEL YOUR PROTEIN

Q Do you know of any tricks to increase the muscle-building potential of a pure protein shake?

A When you eat protein, the goal is to make sure it is mainly used for muscle building and not simply as a fuel source. If you consume a meal of pure protein, chances are a good portion of that protein is going to be converted to blood sugar and burned for energy. However, if you combine your protein with 20 grams to 30 grams of low-glycemic carbs, such as sweet potatoes or brown rice, your body



REAL MUSCLE IMPLANTS?

Silicone implants, while used widely as breast implants, are also being used for other cosmetic improvements to the body, including skeletal muscle replacements. Bodybuilders have used them for over a decade to cosmetically increase muscle size and the look of certain body parts that may lag behind others because of genetic limitations. Chest and calf implants are the most popular ones, but implants can be used for any body part.

Implants, however, while providing some limited aesthetic function, are no substitute for the real thing. Increasing muscle tissue in those areas would provide not only cosmetic but also structural and functional improvements. As well, replacing or stimulating the regeneration of muscle tissue could also be used for repairing torn or atrophied muscles.

Contrary to what you may hear from various therapists and others in the sports community, there is currently no available treatment that hastens the repair of damaged muscle. The use of various modalities, including laser, acupuncture, prolotherapy, etc., while useful in the healing process, do not significantly increase muscle regeneration.

However, that may soon change. At present there are potentially two ways of providing real muscle tissue for replacement or repairing skeletal muscles. One way is by stimulating the growth of muscle by using growth factors and/or stem cells. For example, a recent study found that increasing local tissue expression of IGF-1 induced both nerve and muscle repair. Another recent study found that both satellite cells and muscle-derived stem cells are both present in adult muscle and that both have the potential to form new muscle cells, with satellite cells more likely to result in muscle hypertrophy.

The second method under investigation for providing muscle tissue involves growing real muscle outside the body and implanting this muscle in the areas needed. Human skeletal muscle cells have been isolated from healthy adults, grown in tissue culture and engineered into human bioartificial muscles (HBAMs). While HBAMs consist of parallel array of fused muscle fibers that have contractile proteins, they fall short of actual skeletal muscle in many respects and are not suitable for skeletal muscle repair or replacement. A new study, however, has taken HBAMs a step further by using repetitive mechanical stimulation to produce muscle tissue with improved structural and functional properties.

It's possible that refinements in culturing muscle tissue will soon produce structurally functional muscle that can be used for a number of applications, including replacement and structural repair of skeletal muscle. They may also provide foundation muscle tissue that can be acted on and molded by anabolic compounds, including anabolic steroids, growth hormone, clenbuterol, various growth factors, stem cells and gene therapy.

GROWTH HORMONE AND IGF-I: THE KEYS TO LONGEVITY?

Anti-aging and life extensionists have stressed the need for hormone-replacement therapy for several years. As a result, there are several hundred anti-aging clinics across the country offering growth hormone injections, and a score of supplements claiming to contain the hormone (which they don't, including the homeopathic compounds).

However, because of significant side effects with GH therapy, including an increased tendency for developing diabetes, fluid retention and arthralgia and carpal tunnel syndrome, GH therapy is still not ready for mass consumption. In fact, a recent review article in the official *Journal of the American Medical Association* urges caution because of potential adverse effects in supplementing with exogenous GH in the elderly.

Nonetheless, the case for GH replacement therapy is getting stronger, as seen in a new study showing that GH levels, as determined by IGF-1 levels, plays a role in longevity. This study looked at 205 healthy individuals between 19 and 93 years old. The study found that old males, but not females, with IGF-1 levels similar to young ones do not show the age-dependent decrease in serum testosterone and lean body mass, nor the increase in fat body mass. Other hormone-metabolic and nutritional parameters did not show that association. This study suggests that GH secretion in adulthood, including old age, as measured by IGF-1 levels, is a measure of both quality and quantity of life potential.

I personally feel that augmenting GH levels naturally is the way to go as far as GH replacement since it has built-in natural safeguards. This can effectively be done by combinations of various amino acids and other compounds and obviate, for most people, the need for synthetic growth hormone injections.



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What this means to you: More and more research is showing the health benefits of a diet rich in whole grains—as well as the health decrements of a diet rich in processed grains. In the same edition of the *American Journal of Clinical Nutrition* as the above study, researchers from the National Public Health Institute in Helsinki report results from a study showing an inverse association between whole-grain intake and the risk of Type 2 diabetes. Whole grains are grains that haven't been processed—they're easily identifiable by way of their high fiber content. Solid whole-grain breakfast choices include 100 percent natural oatmeal and cereals rich in bran, including All-Bean and Fiber One.

GLUCOSAMINE DOES YOUR JOINTS GOOD

Vigorous exercise can be a real pain—especially in the knees. From deep squats to hard sprints, the knees sure seem to take more than their fair share of punishment. If knee pain is slowing you down, take note: According to a report published in the February 2003 edition of the *British Journal of Sports Medicine*, glucosamine supplementation may alleviate knee pain and improve knee flexibility and performance.

In the study, researchers divided a group of 44 knee-pain sufferers between two groups: One group received 2,000 milligrams of glucosamine a day; the other received a placebo. After 12 weeks, 88 percent of the glucosamine group reported some degree of improvement in their knee pain versus only 17 percent in the placebo group.

What this means to you: "These results suggest that glucosamine supplementation can provide some degree of pain relief and improved function in persons who experience regular knee pain, which may be caused by prior cartilage injury and/or osteoarthritis," the researchers

conclude. "The trends in the results also suggest that, at a dosage of 2,000 milligrams per day, the majority of improvements are present after eight weeks."

JUICED SUPPLEMENTS?

Three nutritional supplements advertised as muscle-builders were found to contain high doses of anabolic steroids, according to a report in the February 2003 edition of the *European Journal of Sport Science*. The supplements, purchased in the United Kingdom and manufactured in the U.S., purported to contain a host of secret anabolic ingredients, including something called "1-T Matrix." When the supplements were put under the microscope, Dr. Hans Geyer says he just about fell out of his lab chair. What he and his German colleagues found were potent concentrations of metandienone, an anabolic steroid that's supposed to be available by prescription only. "It's terrible," Dr. Geyer says. "It's a criminal act. We were very shocked by it."

What this means to you: This study further pounds home the importance of purchasing nutritional supplements from honest, reputable manufacturers who abide by stringent manufacturing and quality-control practices.



PHOTO BY MIKE GELB



What this means to you: This research shows you don't need a treadmill or any other piece of fancy equipment to get a good cardio workout. Heck, you don't even need a pair of tennis shoes. For a great workout anytime, anywhere, try going five three-minute rounds of fast-paced shadow boxing, with a minute of rest between rounds—just like the pros.

PROTEIN AND CARBS BUILD MORE MUSCLE

To those wishing to pack on more muscle, University of Texas researchers offer this fair warning: Don't forget the carbs! In a study published in the March 2003 edition of the journal *Medicine and Science in Sports and Exercise*, Dr. Robert Wolfe and colleagues discovered that a combination of protein and carbohydrates builds more muscle when taken after a weight workout than does either taken alone. Specifically, in those who took a

carb/protein combo post workout, the rate of muscle protein synthesis (muscle growth) was 115 percent greater than those who consumed just carbs and 61 percent greater than those who consumed only protein. "Findings

indicate that the combined effect on net muscle protein synthesis of carbohydrate and amino acids given together after resistance exercise is roughly equivalent to the sum of the independent effects of either given alone," the researchers conclude.

What this means to you: Seems carbohydrates play a more important roll in muscle building than we originally thought. For greater gains in muscle size and strength, be sure you get a combination of protein and carbs within an hour after your weight-training workouts.

CEREAL KILLERS

The next time you head down the breakfast aisle and are faced with that dizzying array of colorful cereal boxes, choose wisely. It could be a life or death decision. Really. According to a report published in the March 2003 edition of the *American Journal of Clinical Nutrition*, both the risk of death and the risk of death from cardiovascular dis-

ease may be significantly lessened by eating whole-grain breakfast cereal. The same couldn't be said for eating refined or processed breakfast cereals, however.

During the five-and-a-half-year study, researchers from Harvard Medical School followed 86,190 healthy physicians between the ages of 40 and 84. Over the course of the study, the researchers documented 3,114 deaths from all causes, including 1,381 due to cardiovascular disease. "Whole-grain breakfast cereal intake was inversely associated with total and cardiovascular disease-specific mortality, independent of age; body mass index; smoking; alcohol intake; physical activity; history of diabetes, hypertension or high cholesterol; and use of multivitamins," the researchers write. "In contrast, total and refined-grain breakfast cereal intakes were not significantly associated with total and cardiovascular disease-specific mortality."

"THE RISK OF DEATH FROM CARDIOVASCULAR DISEASE MAY BE SIGNIFICANTLY LESSENED BY EATING WHOLE-GRAIN BREAKFAST CEREAL."

time, lost nine times more fat than those in the endurance-training group.

"These results reinforce the notion that for a given level of energy expenditure, vigorous exercise favors negative energy and lipid balance (fat loss) to a greater extent than exercise of low to moderate intensity," conclude the researchers.

BURNS MORE FAT!

For years, we've been told that long-duration, low-intensity aerobic exercise is the best method for burning fat. But,

as the above findings show, this isn't altogether true. While studies show high-intensity aerobics may burn a little less fat than its low-intensity counterpart during the time actually spent exercising (due to the fact that the body tends to shift toward burning carbohydrates to a greater extent than fat when exercise intensity increases), the total expenditure of calories (and fat) is up to 50 percent greater with intense cardio.

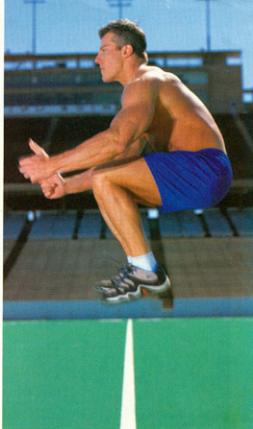
Why? Well, studies show most of the fat you burn with high-intensity cardio occurs after exercising, not during the workout itself. Research presented in the journal *Medicine and Science in Sports and Exercise* shows that when you work out using high-intensity intervals, the total amount of calories your body burns is elevated up to 142 percent more than low-effort aerobics within the hour after your workout. And it doesn't stop there. Research published in the journal *Metabolism* shows this potent post-exercise burn may persist for up to 48 hours after exercising.

BUILDS FITNESS!

Research also shows the more fit you become, the more likely you are to use fat as fuel for any given activity. Peak

fitness is generally defined as having both a high aerobic and anaerobic capacity. Your maximum oxygen capacity, or VO_2 peak, is generally considered the best measure of aerobic fitness. As exercise intensity increases beyond your VO_2 peak, your body shifts to anaerobic (without oxygen) energy production. In the face of this oxygen debt, lactic acid levels build up in tissues, making your muscles feel sore. Your ability to continue exercising at this point is called anaerobic capacity. Notice that athletes in sports where a high level of both aerobic and anaerobic fitness are necessary (wrestling, basketball, boxing) are some of the leanest, most fit individuals around.

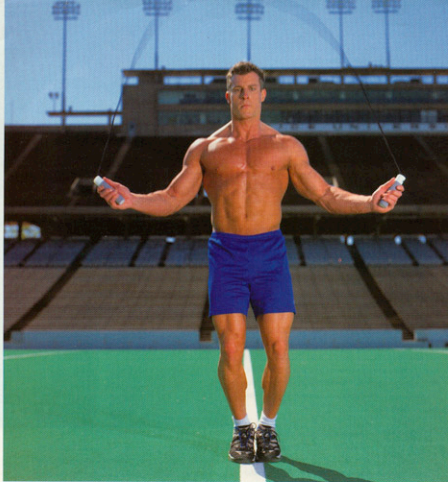
Unfortunately, most popular cardio options—jogging,



long-distance cycling, stair-stepping—primarily stress your aerobic system while doing little to train your anaerobic system. However, research is showing that short bouts of high-intensity interval training may train both systems.

For instance, Dr. Izumi Tabata and colleagues from the National Institute of Health and Nutrition in Tokyo, Japan, recently pit a short-duration, high-intensity interval training program against a long-duration, moderate-intensity endurance program—similar to the ones commonly prescribed by advocates of the so-called fat-burning zone.

In the moderate-intensity group, subjects riding exercise cycles were asked to pedal at 70 percent of VO_2 peak for an hour a day, five days a week. VO_2 peak and anaerobic capacity were measured before and after each training session for the duration of the six-week study.



A second group also exercised five days per week—only, these folks weren't afforded the luxury of pedaling along at such a leisurely pace. After a short warm-up, this group was made to carry out eight sets of 20-second maximum-intensity sprints on an exercise cycle (170 percent of VO_2 peak) with only 10-second rests between each bout. Again, VO_2 peak and anaerobic capacity were determined before, during and after the training.

The results, in some respects, weren't too surprising—in others, they were earth-shattering. As to be expected, the

moderate-intensity endurance-training group experienced a rather significant increase in VO_2 peak (about 10 percent), but, also not surprisingly, this regimen had absolutely no effect on anaerobic capacity. On the other hand, the high-intensity interval-training group experienced a stunning 14 percent increase in VO_2 peak and a 28 percent increase in anaerobic capacity.

This is believed to be the first study showing a single cardiovascular regimen improving both aerobic and anaerobic power so significantly. What's more, according to the

researchers, the 14 percent increase in VO₂ peak in only six weeks on the high-intensity protocol is one of the highest ever recorded in exercise science.

SPARES MUSCLE!

Too much aerobics burns muscle, which is apparent if you compare the physiques of marathon runners with those of 100-meter sprinters. This is important because muscle not only helps you look leaner and stronger, it also makes your body more metabolically active. That is, when you have more muscle, you burn more calories—around the clock. Explains Ben Harley, Ph.D., a metabolic researcher at the University of Maryland, "An increase of lean muscle mass can, in some cases, crank up your basal metabolic rate by as much as 7 percent." That means, by sparing the muscle you have, your body may burn 300 or more extra calories per day at rest.

ENCOURAGES THE RELEASE OF KEY HORMONES

Research has shown that the exercise-induced response of growth hormone, one of your body's key fat-burning/muscle-sparing hormones, is workload dependent—meaning that with increasing intensity, growth hormone secretion increases.¹ Recent research has also

shown that growth hormone secretion is greater with acute anaerobic exercise bouts, such as sprinting, and less with continuous aerobic activity, like long-distance running.¹

This was recently illustrated by researchers at Loughborough University in Leicestershire, England. In this study, 23 highly trained sprint (100- to 400-meter) and endurance (1,500- to 10,000-meter) athletes were tested for growth hormone levels after performing an all-out 30-second sprint on a treadmill. According to the authors, there was a marked growth in hormone response for all athletes, but the response was three times greater for the sprint-trained athletes than for the endurance-trained athletes. Further, one hour following exercise, growth hormone levels were still approximately 10 times greater than pre-exercise levels in the sprint-trained group. This is important because the authors speculated that the overall effect of the long-term increase of growth hormone in the sprint-trained group might result in an increase in fat metabolism, decreased body fat and a decrease in protein catabolism (decrease in the breakdown of lean muscle).

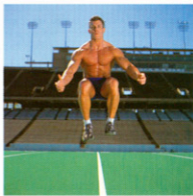
WHAT ABOUT CORTISOL?

One of the most compelling arguments against heightened intensity cardiovascular exercise is the potential for elevated levels of the body's catabolic (muscle-wasting) hormone cortisol, which is known to rise during times of stress (exercise is stress). However, Dr. James Sowash, an exercise physiologist at Winston-Salem State University, says these concerns may be overblown.

In a study published in the May 2002 edition of the *Journal of Strength and Conditioning Research*, Dr. Sowash and colleagues found that short periods of high-intensity exercise do not elevate cortisol any more than do long periods of low- or moderate-intensity exercise.¹ The researchers did find that high-intensity exercise performed for long periods of time—an hour or longer—may indeed elicit a rise in cortisol above and beyond that produced during longer periods of low- or moderate-intensity exercise. But as long as you keep it short (fewer than 40 minutes, say the researchers), cortisol seems to be of little consequence.

REAL-WORLD PROOF

R. De La Cruz may have chuckled at the prospects of doing a cardio program that required only minutes of his time, but seconds into his first workout, he quickly discovered that this type of training is no joke. "Get ready to sweat," De La Cruz says. "Take an extra towel and maybe even a mop with you to the gym."



THE GUERRILLA CIRCUIT

If you wanted to maximize the development of your biceps, you wouldn't choose just one exercise—concentration curls, for example—and do those and only those for now and forever, would you? Of course you wouldn't. You would hit the muscle from all different angles with a variety of exercises like barbell curls, hammer curls, reverse-grip pull-ups, etc. So when we want to maximize fat loss, why do we so often

choose to just ride the exercise bike or just run on the treadmill or just do the stairstepper?

Occasionally integrating a variety of exercises into your cardiovascular regimen provides a blend of fitness-promoting benefits unique to each exercise and serves to keep your body off balance. The Guerrilla Circuit offers all the advantages of high-intensity interval training with the added benefits of exercise diversity.



MINUTES 1-13:

Warm-up jog at 50 percent perceived maximum effort followed by:

STATION 1: SPRINTING

Sprinting, either done outdoors or on a treadmill, should be performed at close to 100 percent of your maximum intensity. Be extremely careful if doing these on the treadmill—stay in control! If you feel you're losing control, slow it down a little.

- Sprinting for 20 seconds
- Rest for 10 seconds
- Sprinting for 20 seconds
- Move to Station 2 (10 seconds)

STATION 2: SKIPPING ROPE

A staple in the cardiovascular programs of prizefighters, skipping rope also conditions your legs, especially your calves, and improves agility. Try to skip fast, but in control, during your 20-second spurts. This may take a little practice, but you'll pick it up in time.

- Skip rope for 20 seconds
- Rest for 10 seconds
- Skip rope for 20 seconds
- Move to Station 3 (10 seconds)

STATION 3: JUMP SQUATS

Jump squats introduce a plyometric element into your training, providing unmatched lower-body conditioning while taxing your cardiovascular system like few exercises can. Start with your hands lightly touching your head. Slowly squat down until your thighs are parallel with the ground, then explode upward, jumping as high as you can, bringing your legs to your chest. Repeat as many times as you can within the 20-second exercise bursts.

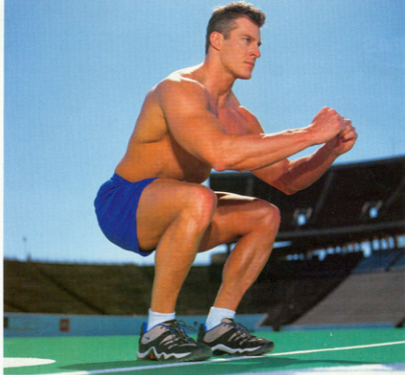
- Jump squats for 20 seconds
- Rest for 10 seconds
- Jump squats for 20 seconds
- Move to Station 1 (10 seconds)

Repeat cycle three times (9 minutes total)

MINUTES 14-17:

Cool-down jog at 50 percent perceived maximum effort





Others who read the article tell similar stories.

"The first week with this type of cardio, I saw amazing results, and my husband was also amazed at the changes in me," says Marissa B. of Antioch, Calif. "I literally saw the fat roll off my back in just a matter of one week! Besides, my kids like the fact that I don't take as long with my cardio sessions. I'm on and I'm off, but the challenge for me is almost frightening."

Indeed, the challenge of pushing oneself—of training with heart and soul—seems to be just as satisfying as seeing the fat go for many people.

"I DID IT!" writes Rhonda Wellner of St. Paul, Minn., on a popular online support group message board. "I had my excuses lined up: My head pounded while I put on my shoes. It was 9:30 a.m. and already hot and humid. We left the stop-watch at home, we couldn't find a timepiece with a second hand ... luckily I just kept moving. Putting on the shorts, tying up the shoes, opening the door. Taking the steps. My husband was at my side. I asked him if he could be my stop-watch for the Guerrilla Cardio. He said sure. I did an extra-

long warm-up. Probably not at a level 5, but at least I was moving. Then I did eight sets of sprinting 20 seconds and walking 10 seconds. Then I did an extra-long cool down.

"The first sprint was more like a run, but the rest were at my fastest, and I swear my heart was going to jump out of my chest! As I walked out the door my head was screaming, 'I don't want to do this!' I answered it saying, 'of course you don't want to do it ... you want to have it done.' It's sometimes how I feel afterward that pushes me when I don't wanna." ←→

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