

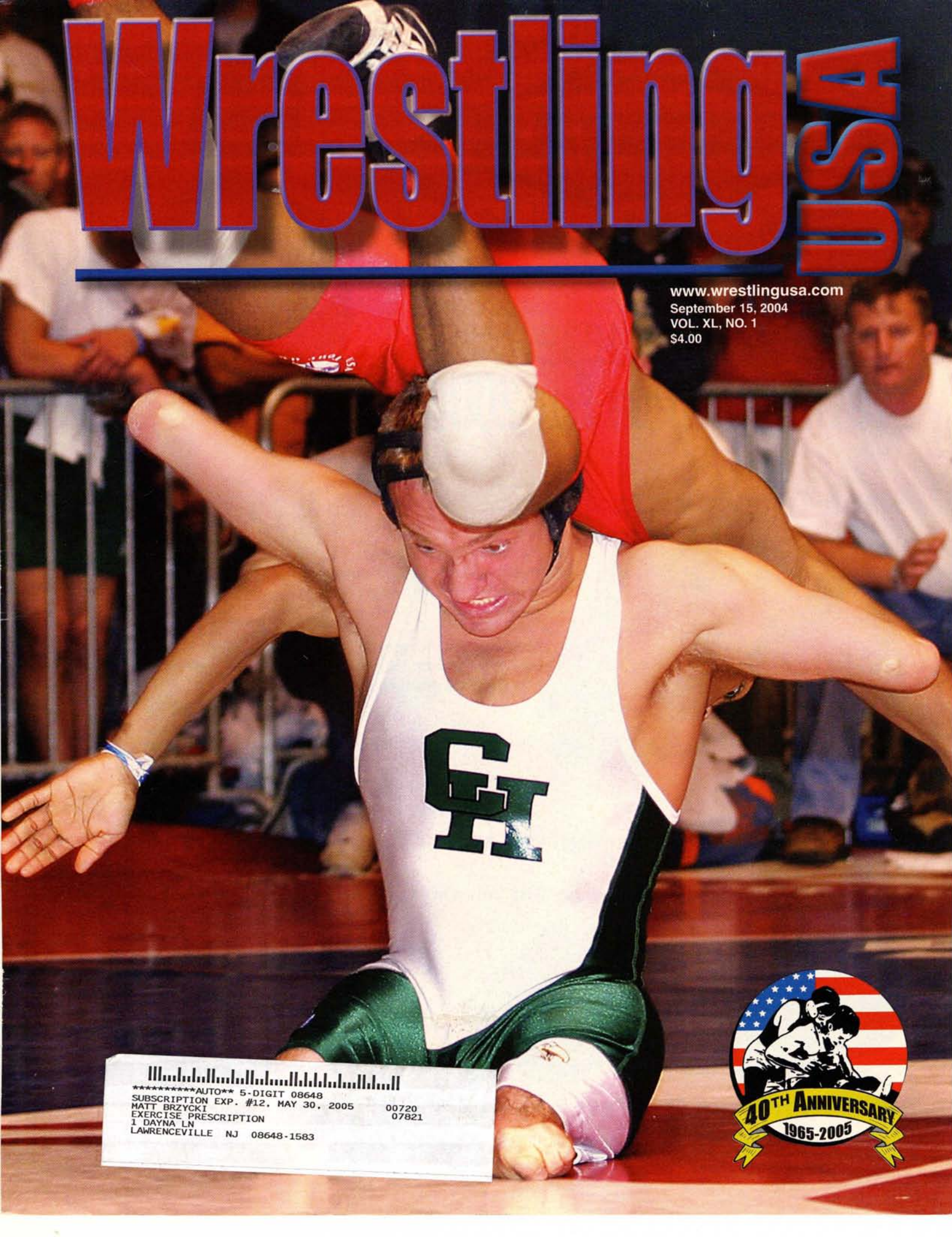
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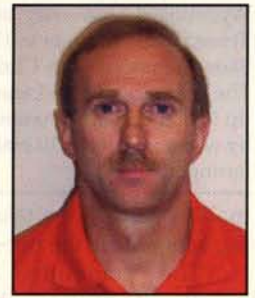
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More Myths in Strength and Fitness

By Matt Brzycki

Perhaps no other discipline is ripe with as many myths as strength and fitness. What follows are ten more myths in strength and fitness.

Myth #1:

Stretching prior to a physical activity will reduce the risk of injury. There is very little research that has investigated the effects of pre-exercise/activity stretching on the risk of injury. But two studies that involved a total of 2,630 military recruits (men aged 17 - 35) who were going through basic training found that stretching prior to an activity reduced the risk of injury by 5% (which was not statistically significant). Over the same period of time, the expected risk of injury was 20%. This suggests that a 5% reduction in the risk of injury would translate into a reduction in absolute risk by a mere 1%. Stretching would seem to be most beneficial when done prior to dynamic, short-duration activities that involve rapid muscular contractions

such as wrestling or sprinting.

Myth #2:

Walking a mile uses the same number of calories as running a mile. The American College of Sports Medicine offers equations for determining oxygen consumption and caloric expenditure during walking and running. Based upon these equations, a 154-pound man who walks one mile in 20 minutes on a level surface will utilize roughly 4.04 calories per minute (cal/min). Over the course of his 20-minute walk, his total caloric usage would be about 80.8 calories [4.04 cal/min x 20 min]. If that same individual ran one mile in 10 minutes on a level surface, he would use about 124.9 cal/min. During his 10-minute effort, he would have used about 124.9 total calories [12.49 cal/min x 10 min]. So, running a mile utilized signifi-

cantly more calories than walking a mile [124.9 cal compared to 80.8 cal]. This is true despite the fact that the duration of walking was twice as long as that of running [20 min compared to 10 min].

Myth #3:

An individual does not start using fat as an energy source until after 20 minutes of exercise. The main source of energy that is used during an activity depends upon the level of effort, not the time of the effort. At rest, the body primarily uses fat as an energy source. As the level of effort increases, there is a greater reliance on carbohydrates to provide energy. So, an individual does not have to exercise for 20 minutes before using fat as a source of energy. In fact, as you read this article, your body is primarily using fat as an energy source. Besides, it is ridiculous to think that the body automatically switches to fat as an energy source at exactly the 20-minute mark.

Myth #4:

Doing higher repetitions will "tone" muscles and doing lower repetitions will "bulk" muscles. There is no scientific evidence that higher repetitions increase muscular definition or "tone" and lower repetitions increase muscular size or "bulk." In one 10-week study, there were no significant differences in muscular size (and strength) between a group who trained with sets of four repetitions and a group who trained with sets of 10 repetitions.

If two wrestlers perform the same program – that is, the same exercises as well as the same number of sets and repetitions – for a period of time, it is highly unlikely that they will end up looking



Hawaii - Hilo High School's Johanson Quist, left, fights off St. Louis wrestler Ben Wilmore at the State High School Wrestling Championships. Quist rallied for a 3-0 deficit to defeat Wilmore 4-3 and capture the coveted state crown. Photo by Gerri Kahili.

New York - Freshman Luke Mitchell (Garden City) nearly catches Senior Tom Moriarty (Long Beach) in a spladle during the 140 lb. match in the New York State Section VIII (Nassau County) High School Individual Championships. Moriarty went on to win the match by technical fall 22-7 to eventually capture the county championship.

like physical clones of each other. Look around the weight room and observe different pairs of training partners. You will see that individuals who train together usually have different physiques – despite doing the same exercises while using the same number of sets and repetitions.

Individuals respond differently to strength training because each person – except for monozygotic (identical) twins – is a unique genetic entity with a different genetic potential for achieving muscular size. Some wrestlers are predisposed toward developing heavily muscled physiques while others are predisposed toward developing highly defined physiques. Therefore, the belief that doing high repetitions with light weights will increase muscular definition and doing low repetitions with heavy weights will increase muscular size is entirely anecdotal with no factual basis whatsoever. Whether sets consist of low repetitions, high repetitions or intermediate repetitions, wrestlers are still going to develop according to their genetic (or inherited) blueprint – provided that the sets are done with similar levels of intensity.

Myth #5:

Lifting weights makes a wrestler become "muscle-bound" and inflexible. First of all, achieving a heavily muscled physique is easier said than done. Everyone can increase their muscle mass (and strength) but the degree to which this is done is a function of an individual's genetic characteristics. Second, there is no correlation whatsoever between muscle mass and flexibility. Some individuals who are very muscular have poor flexibility; other individuals who are very muscular have outstanding flexibility. Consider John Grimek who was perhaps the most muscular man of his generation. He won the 1940 and 1941 AAU (Amateur Athletic Union) Mr. America, the 1946 AAU America's Most Muscular Physique and the 1948 Mr. Universe (where he beat the legendary Steve Reeves of Hercules fame). By the way, Grimek was also exceptionally strong. He competed for the United States in the 1936 Olympics in Germany and placed fourth at the 1938 World Weightlifting Championships in Vienna. At any rate, Grimek had an extremely muscular physique but was flexible enough to do a



front split.

Wrestlers who lift weights can lose flexibility if they perform repetitions throughout a limited or partial range of motion. Those who do not fully extend their arms during a bicep curl, for example, will eventually lose flexibility in their elbow joints. But doing repetitions throughout a full range of motion will maintain – or even improve – flexibility. Wrestlers who have residual fears that lifting weights will make them less flexible can stretch their muscles immediately after the completion of each exercise in the weight room.

Myth #6:

Female wrestlers who lift weights will develop large, unsightly muscles. Since the early 1960s, research has shown that most women can achieve significant increases in their muscular strength without concomitant increases in their muscular size. One researcher, for example, found that a group of 47 women improved their strength in the leg press by nearly 30% after 10 weeks of training yet the largest increase in muscular size that was experienced by any of them was less than one-quarter inch.

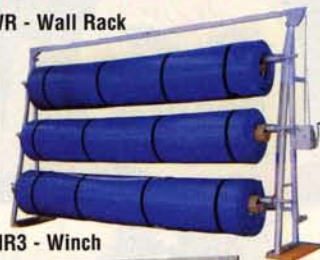
There are several physiological reasons that prevent or minimize the possibility that women will significantly increase the size of their muscles. For instance, most women have relatively low levels of serum testosterone that restricts the degree to which they can increase their muscular size.

There are a relatively small number of women who have inherited the ingredients necessary to experience significant increases in their muscular size from lifting

weights. However, the overwhelming majority of women can gain considerable muscular strength from lifting weights yet have little or no change in their muscular size. In short, it is physiologically improbable for the average woman to develop large muscles that are unsightly or unfeminine.

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Myth #7:

Eccentric contractions produce muscular damage and should be avoided at all costs. There are three types of muscular contractions: concentric, eccentric and isometric. A concentric contraction is one in which a muscle shortens against a load (such as when raising a weight). An eccentric contraction is one in which a muscle lengthens against a load (such as when lowering a weight). And an isometric contraction is one in which the contractile component of a muscle shortens while the elastic connective tissue lengthens by the same amount, thereby producing no change in the overall muscle-tendon length (such as when holding a weight in a static position).

The truth is that muscular damage and soreness can occur if a muscle is loaded excessively in a concentric, eccentric or isometric manner. And, in fact, some studies have shown that eccentric contractions do not induce a greater level of muscular soreness than concentric contractions. Research has suggested that the intensity of the activity – not the type of muscular contraction – may be the dependent factor in producing muscular soreness.

Interestingly, research has shown that an adaptive response occurs from doing eccentric contractions. In one study, sub-

jects who only performed concentric contractions during their training “complained of severe muscle soreness” after completing post-training tests in which eccentric contractions were done. Meanwhile, subjects who performed a combination of concentric and eccentric contractions during their training did not report any muscular soreness after completing the same post-training tests.

Keep in mind, too, that the duration of the eccentric phase of a repetition involves a relatively brief period of loading. If a weight is lowered in about 3 - 4 seconds per repetition, for example, then the eccentric loading that occurs during a set of 15 repetitions only lasts about 45 - 60 seconds.

The eccentric phase of a repetition – and eccentric activity, for that matter – is safe and productive as long as it is not performed to an extreme. As muscles become more familiar with eccentric loading, any amount of muscular soreness and tissue damage that may be experienced will be reduced.

Myth #8:

Doing exercises on a ball is a great way to improve strength, balance and core stability. Supposedly, the instability of the ball provides greater neuromuscular stimulation and promotes “core stability.” That

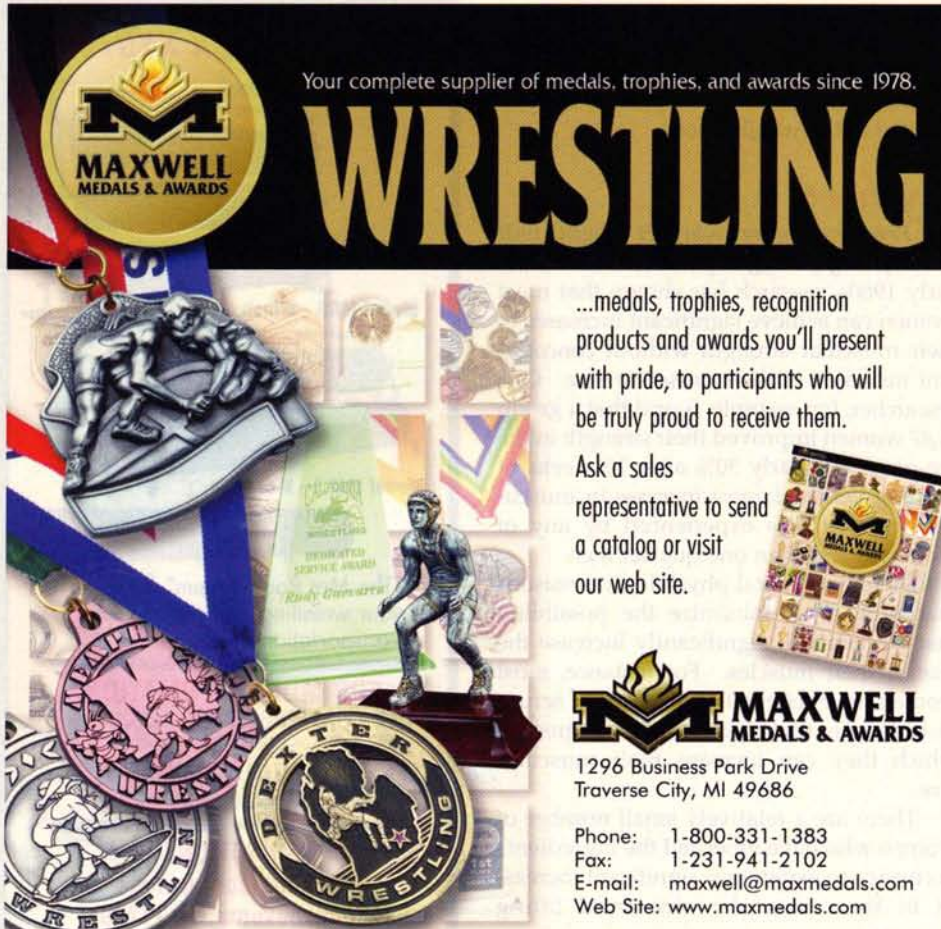
certainly sounds intriguing but what does the research say about exercising on a ball?

In a recent study that involved eight physically active men, researchers examined the effects of performing isometric contractions under conditions that were unstable (sitting on a Swiss ball) and stable (sitting on a bench). Here is what they found: In the unstable condition, the force output during a leg extension was 70.5% less than in the stable condition. Stated differently, the force output while doing a leg extension on an unstable ball was only 29.5% of the force output while doing a leg extension on a stable bench. And in the unstable condition, the activation of the quadriceps during a leg extension was 44.3% less than in the stable condition. So, more instability correlated to less force production and less muscle activation. Needless to say, this is not desirable when it comes to strength training.

Doing exercises on a stability ball has not been as widely accepted by strength coaches as some might think. According to Dan Riley, the Strength and Conditioning Coach of the Houston Texans who has more than 20 years of experience training professional athletes: “I do not advise using a ball as a bench or platform while lifting meaningful weights with the purpose of stimulating maximum strength gains. I prefer the opposite. I want a very stable foundation to allow our players to focus on the act of performing the exercise without any external inhibitors that might limit the amount of weight they use and ultimately the potential strength gains to be made in the muscles we are trying to target.”

To date, there is no scientific evidence to support the contention that instability training – on balls or other unstable objects (such as “balance discs” and “wobble boards”) – improves neuromuscular coordination or balance. What about the practice of doing unassisted squats while balancing on a ball? To quote the researchers in the aforementioned study: “Whether some of these circus-type maneuvers provide specific crossover training adaptations to sport is still under debate and demands further investigation.” Adds Coach Riley, “I cannot see how squatting on a ball can be considered a safe and productive activity for any athlete.” As for core stability, it is a somewhat ambiguous term that would be difficult to measure.

So any support for the use of stability balls appears to be entirely anecdotal without scientific support. That said, exercising on stability balls can be used to provide variety to workouts. Just be aware that their use is relatively ineffective for improving muscular strength and balance and any purported advantages are purely speculative.



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Myth #9:

The Body-Mass Index is a valid way of determining if a wrestler needs to lose weight. Essentially, the Body-Mass Index (or BMI) is a ratio of someone's height to weight. It is used frequently as a quick and handy way to estimate if a person weighs too much (or too little). Overweight is a BMI of 25 or more; obese is 30 or more.

To calculate the BMI of an individual, follow these three steps:

1. Take the height in inches and square it (multiply it by itself).
2. Divide that number by the body-weight in pounds.
3. Multiply that number by 703.

For example, an individual who is 5'10" and weighs 209 pounds has a BMI of more than 29.9 – a value that's just shy of being categorized as obese. Now, here is the kicker: This happens to be the height and weight of Emmitt Smith of the Arizona Cardinals who has rushed for more yards than any running back in the history of the National Football League. A quick glance at the physique of this future Hall of Famer would reveal that he is not anywhere near being obese. In fact, his percentage of body fat is undoubtedly in the single digits.

Based upon the BMI, many wrestlers – and other muscular athletes – would be considered overweight if not obese.

Clearly, a wrestler can have a high BMI yet may not need to lose any weight. So, the BMI can certainly be used to estimate if a wrestler needs to lose weight but body composition is much more valid and should be taken into consideration.

Myth #10:

Chromium decreases body fat and increases muscle mass. Most of the claims regarding the benefits of chromium are based upon two poorly controlled, unpublished studies. These two studies were referenced in a review article that was written by a chemist who was consulting for a supplement company. In 1996, the Federal Trade Commission ordered the company and (two others) to stop making unsubstantiated claims that chromium decreases body fat and increases muscle mass. Nevertheless, misconceptions about chromium still persist.

Chromium is an essential micromineral that functions in the metabolism of carbohydrates and fat and helps to maintain blood-glucose levels. However, numerous studies have shown that the short-term use of chromium does not decrease body fat or promote fat loss in any way. In a 16-week study that involved 95 healthy Navy personnel, for example, a group that received chromium did not significantly reduce

body fat more than a group that received a placebo.

But what about its effect on muscle mass? As of 1999, only one study has reported that chromium increases muscle mass. In that study, however, muscle mass was estimated from anthropometric measurements which can be unreliable.

Incidentally, it appears as if chromium does not increase muscular strength, either. In a 12-week study, a group that received a placebo actually increased their strength more than a group that received chromium. Interestingly, the researchers in this study also found that the subjects who received chromium had urinary chromium losses that were nine times greater than the subjects who were given a placebo. 🐘

Matt Brzycki has authored, co-authored or edited 11 books on strength and fitness including *Wrestling Strength: The Competitive Edge*, *Wrestling Strength: Prepare to Win* and *Wrestling Strength: Dare to Excel*. The three wrestling books are available at all major bookstores or through Cardinal Publishers Group (800-296-0481).

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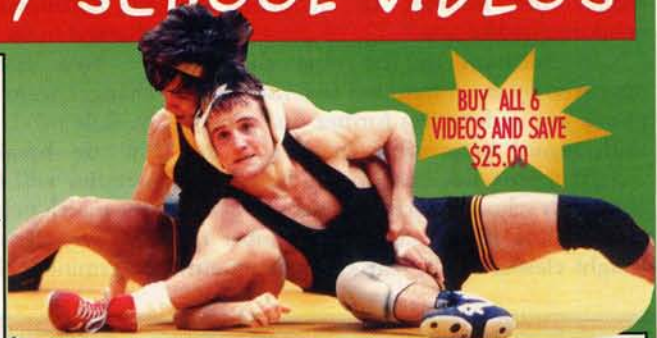
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