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## THE EAT SURVEY: LESSONS LEARNED ABOUT UNHEALTHY BEHAVIORS

By Matt Brzycki

**D**uring the course of the day, we're regularly exposed to images of muscular men and women. These images are projected to us through a variety of media outlets, including advertisements, commercials, television shows, movies and magazines.

As time passes, the images that are portrayed by the media grow increasingly more muscular and sometimes are well beyond the limits of mere mortals. For example, researchers measured the waist, chest and biceps of a GI Joe Extreme. When they scaled the measurements of this classic action figure to a 5'10" man, they found that he would have a 54.8" chest, 36.5" waist and 26.8" biceps. That's nothing: When they scaled the measurements of the superhero Wolverine to a 5'10" man, they found that he would have a cartoonish 62" chest, 33" waist and 32" biceps. Not to be outdone, a Barbie doll, when scaled to a 5'4" woman, would have measurements of 32-17-28; that is, a 32" chest, 17" waist and 28" hips.

Few athletes, if any, wouldn't want to look better. But in an effort to improve their appearance, many of them resort to unhealthy behaviors. Adolescents are particularly vulnerable as they struggle to establish their own identities. During this emotionally fragile time, many adolescents may develop feelings of inadequacy and have a negative perception of their body image, causing them to employ unhealthy behaviors.

### RECENT RESEARCH

A study by Maria Eisenberg of the University of Minnesota and her colleagues gleaned data from the Eating and Activity in Teens (EAT) 2010 survey. Included in their research were data on 1,307 boys and 1,486 girls (average age 14.4) at 20 urban middle schools and high schools in the Minneapolis/St. Paul (MN) area.

The researchers examined what they referred to as "muscle-enhancing behaviors." Specifically, they looked at how often adolescents changed their eating, exercised more, used protein powders or shakes, used steroids and used other muscle-enhancing substances. Let's take a look at each of these five behaviors, noting their efficacy – especially with respect to appearance and performance – and safety.

### Eating

According to the EAT survey, 68.4% of the boys and 62.2% of the girls changed their eating behaviors in an attempt to increase their muscularity. This has the potential to be a healthy behavior but often it's not.

In an effort to gain weight, for example, some athletes eat enormous amounts of food, just for the sake of getting lots of calories. But when weight is gained too quickly, at least some of the increase will be in the form of fat, not muscle. Similarly, when weight is lost too quickly, at least some of the decrease will be in the form of muscle and/or water, not fat.

### Exercising

The EAT survey found that 91.2% of the boys and 80.6% of the girls exercised more in an attempt to increase their muscularity. Again,

this has the potential to be a healthy behavior but often it's not.

Some athletes – male and female – develop a preoccupation with their muscularity, a term known as muscle dysmorphia. Those with this condition believe that they aren't muscular enough even though they may actually be quite muscular. This often leads to exercise addiction with workouts that are too frequent and lengthy, increasing the potential for overuse injuries and the use of muscle-enhancing substances.

### Protein Powders or Shakes

In the EAT survey, 34.7% of the boys and 21.2% of the girls used protein powders or shakes. The use of these substances was higher by those who were overweight/obese and those who participated on a sports team.

For youths aged 9 to 13, the Recommended Dietary Allowance (RDA) for protein is 0.95 grams per kilogram of bodyweight per day (g/kg/d); for youths aged 14 to 18, the RDA for protein is 0.85 g/kg/d. Youths who eat a normal diet that contains 15% of its calories as protein have no trouble meeting this recommendation.

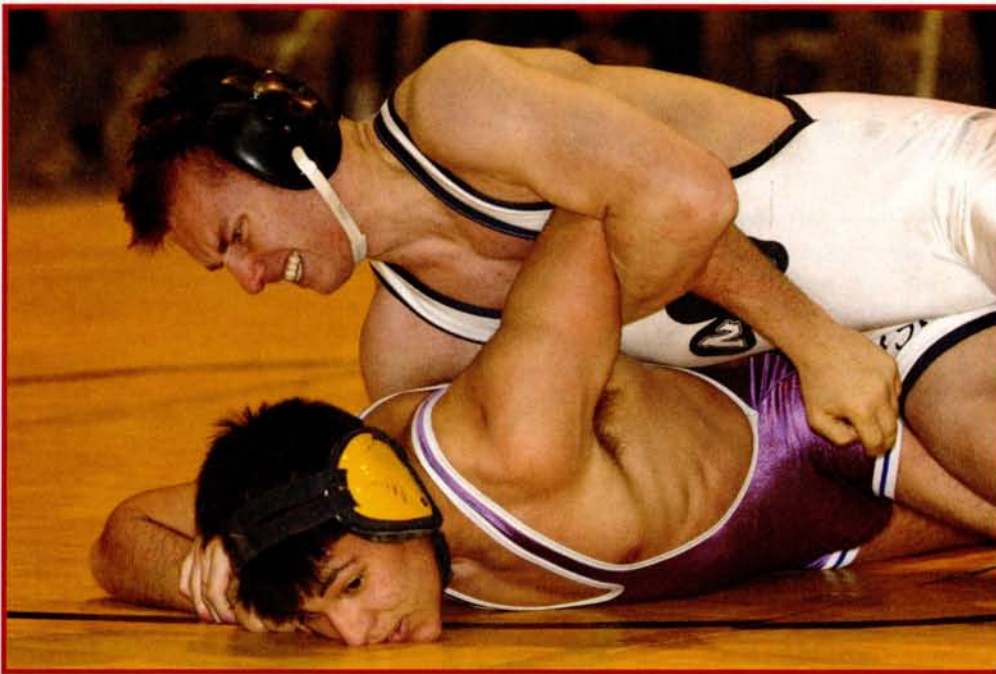
But what about your wrestlers? Well, the protein needs of active youths are higher than those of their inactive counterparts. But the fact of the matter is that youths who consume adequate calories generally obtain adequate protein.

Remember, caloric requirements are determined by several factors, including age, gender, size and level of activity. Active youths require and consume more calories than inactive youths. For example, an 18-year-old boy who weighs 148 pounds requires an estimated 2,358 calories per day if sedentary and 3,779 calories per day if very active. With these additional calories comes additional protein. In other words, the increased protein need of athletes is met by an increased caloric intake.

According to the Academy of Nutrition and Dietetics, active individuals should consume 1.2 to 1.7 g/kg/d. Assuming a sufficient caloric intake, 1.3 to 2.1 g/kg/d – about 135 to 250% of the RDA for youths aged 9 to 18 – is present in any normal diet that contains 15% of its calories as protein.

So even if the requirement for athletes is greater, it's likely that they're already getting enough protein to ensure proper levels of consumption. Athletes who are concerned that they're not getting enough protein can obtain adequate amounts by simply consuming more foods that are high in protein such as lean or low-fat meat and poultry.

It must be understood that an excessive intake of protein carries the potential for adverse effects. An intake of protein that's greater than the needs for the growth, maintenance and repair of biological tissues is either stored as fat or excreted in the urine. When a large amount of protein is urinated, it places a heavy burden on the kidneys and the stress may damage that organ. A high intake of protein also increases the risk of dehydration which, in turn, increases the risk of developing a heat-related disorder such as heat exhaustion, heat stroke or heat cramps. Other potential adverse effects from a high intake of protein include diarrhea, cramps, gastrointestinal upset and an excessive loss of calcium in the urine.



2013 Rocky Mountain Nationals - 120 lbs. Tanner Luke (Utah) trying to turn Levi Maes (Wyoming) with an arm bar. Maes won by major decision 11-3 to win this championship match. Photos by Dean Vande Berg.

tility, rage and aggression that's commonly referred to as "roid rage." In addition, younger boys and girls who use steroids may experience a premature closure of their epiphyseal (growth) plates which can result in stunted growth.

Keep in mind that these are potential adverse effects; there's a great deal of variability based on the type of steroid, dosing regimen and duration of use as well as individual tolerances. Also worth mentioning is that while some adverse effects are reversible with cessation of use, others are not.

It must be noted that for ethical reasons, studies often use relatively small doses of steroids and for short periods of time. In "real life," though, steroids are usually taken in much higher doses and for longer periods of time thus presenting a much greater risk. So, if anything, research grossly underestimates the true extent of the adverse effects.

## Steroids

In this particular survey, 5.9% of the boys and 4.4% of the girls used steroids. Since this information was self-reported and the fact that steroids are illegal in the United States without a prescription, it's likely that the actual usage is much greater.

Steroids are synthetic (man-made) derivatives of testosterone that have anabolic as well as androgenic properties (thus the technical term of anabolic-androgenic steroids). The anabolic (growth-promoting) effects of testosterone include increases in strength, muscle mass, bone density and protein synthesis; the androgenic (masculinizing) effects include the development of male secondary sexual characteristics such as an increase in facial and body hair, a deepening of the voice and a heightened libido. Scientists who develop steroids try to maximize the anabolic effects and minimize the androgenic effects.

Steroids can be taken by ingestion, injection, a transdermal patch or cream/gel. By far, the most common way of self-administration is injection.

Up to about 1980, studies had shown that steroids weren't effective. Since then, though, many studies have found that steroids increase strength. Steroids also increase muscle mass. However, steroids don't decrease fat mass. Upon termination of steroid use, the drug-induced improvements in muscular size and strength gradually diminish. There's no evidence that steroids increase endurance or expedite recovery between workouts.

A multitude of adverse effects from steroids have been documented in the scientific and medical literature. A short list includes acne, gynecomastia (boys), decreased testicular size (boys), decreased breast size (girls), elevated cholesterol and psychiatric disorders such as mood swings, mania and depression. Perhaps the one psychiatric effect that's most often associated with steroid use is an increased level of unpredictable hos-

## Other Muscle-Enhancing Substances

According to the EAT survey, 10.5% of the boys and 5.5% of the girls used other muscle-enhancing substances. As examples, the survey mentioned creatine, amino acids, hydroxy methylbutyrate, dehydroepiandrosterone and growth hormone. Here's a closer look at each of these substances:

### Creatine

For the past 20 years or so, creatine has received a great deal of attention within the athletic, scientific and medical communities. It may very well be the most studied nutritional supplement in history.

Research has shown that creatine increases fat-free mass and bodyweight. However, the consensus is that this is largely attributable to fluid retention, not muscle hypertrophy.

In terms of improving performance, the research on creatine is, at best, inconclusive. Much of the research that has investigated creatine has been conducted in a laboratory. In this controlled setting, the best evidence for performance enhancement is in repeated, maximal, short-term efforts. And even then, some studies have shown no improvements. Of the research that has been conducted outside a laboratory, most studies have shown that creatine doesn't improve performance any more than a placebo in real-life activities such as running. In some studies, creatine actually worsened performance.

It appears as if using creatine in the recommended dose is safe. However, many athletes – thinking that more is better – likely exceed the recommended dose, undoubtedly putting them at greater risk for incurring adverse effects. At this point in time, the long-term effects of creatine are unknown. Creatine shouldn't be used by those who are under the age of 18.

Adverse effects from creatine are rarely reported in studies. But most studies don't include any formal way of assessing adverse effects. In one study that did, the researchers surveyed 52 collegiate athletes who voluntarily took creatine of which 38 (73.1%) reported

at least one adverse effect.

While few adverse effects have been reported in studies that were done in a laboratory, there have been endless accounts from individuals who have experienced adverse effects in real life. Although these observations are anecdotal, their sheer volume is such that they can't be ignored. There are numerous reports of water retention, muscle cramps, dehydration/heat-related disorder, muscle strains/dysfunction, gastrointestinal distress (such as an upset stomach, gastrointestinal pain, nausea, vomiting and diarrhea) and liver and kidney dysfunction.

## Amino Acids

The so-called "building blocks" of protein are amino acids. Of the 20 amino acids, nine can't be synthesized by the body and must be obtained from food. These amino acids are considered essential or indispensable. Protein from animal sources contains all nine essential amino acids in adequate amounts.

Included among the essential amino acids are branched chain amino acids (BCAAs). There are three BCAAs: isoleucine, leucine and valine.

Most studies haven't found any evidence that BCAAs enhance performance. There's limited evidence to suggest that BCAAs reduce muscle soreness or improve recovery.

For youths aged 9 to 13, the RDAs for isoleucine, leucine and valine are 22, 49 and 28 milligrams per kilogram of bodyweight per day (mg/kg/d), respectively; for youths aged 14 to 18, the RDAs for isoleucine, leucine and valine are 21, 47 and 27 mg/kg/d, respectively. Considering an 18-year-old who weighs 148 pounds, that shakes out to a daily intake of about 1,413 mg of isoleucine, 3,161 mg of leucine and 1,816 mg of valine.

The RDA for BCAAs can be met easily by consuming a normal diet that contains 15% of its calories as protein, paying particular attention to lean or low-fat meat and poultry. For instance, one chicken breast (140 g) has about 2,293 mg of isoleucine, 3,259 mg of leucine and 2,155 mg of valine.

## Hydroxy Methylbutyrate

Thankfully, hydroxy methylbutyrate goes by the letters HMB; it's a metabolite of leucine which is, as just noted, a BCCA.

HMB has been thought to increase strength and lean-body mass but scientific support is lacking. In one study, 35 athletes were randomly assigned to groups that received either HMB or a placebo for four weeks. After a one-week washout period, the athletes were switched to the other treatment for four weeks. There were no significant differences between HMB and the placebo in improving strength and body composition.

Research on HMB has found minimal performance enhancement in untrained individuals and almost none in trained individuals. One meta-analysis pooled data from nine studies that involved 394 subjects. In untrained subjects, HMB produced small improvements in lower-body strength and negligible improvements in upper-body strength; in trained subjects, HMB produced "trivial" improvements in lower-body and upper-body strength. In both untrained and trained subjects, the effect on body composition was also described as trivial.

Based on the research that's currently available, there's no evidence that HMB is associated with any adverse effects.

## Dehydroepiandrosterone

As a prohormone, dehydroepiandrosterone (DHEA) is a precursor to many hormones, including testosterone. Because of this, it's believed that using DHEA can increase the production of testosterone in the body which could yield the same effects as steroids. This

hasn't been corroborated by research, however.

In one study, 20 male athletes were randomly assigned to groups that received either DHEA or a placebo for four weeks. DHEA increased total testosterone more than the placebo but no significant improvements in body composition were made by either group.

Since DHEA is a precursor to steroids, it's no surprise that it has the potential for similar adverse effects. Understand that this or any other steroid precursor could cause an athlete to fail a drug test for steroids.

Of no small importance is that many DHEA products have been shown to contain wildly inaccurate doses. Stanford Research Institute International analyzed 16 DHEA products and found that only seven had an amount that was within typical product specifications that were stated on the label; one product had nearly 150% of the amount on the label. Amazingly, one product had no DHEA whatsoever and two other products had trace amounts.

## Growth Hormone

As its name implies, growth hormone is responsible for growth and development. In the body, growth hormone is produced and secreted by the pituitary gland. Since growth hormone stimulates protein synthesis, it has attracted some attention from the athletic community as a muscle-enhancing substance.

Studies have shown that growth hormone increases lean-body mass – likely through fluid retention, not muscle hypertrophy – and decreases body fat. However, studies have shown that growth hormone doesn't increase muscular strength or muscle circumference.

Growth hormone is illegal in the United States without a prescription. Approved medical uses of growth hormone are in the treatment of growth disorders in children and a deficiency of growth hormone in adults.

Over-the-counter products are available but they're precursors or "releasers" of growth hormone. There's no evidence that these products are effective at improving lean-body mass.

Since no legitimate studies have been published on over-the-counter growth hormone, its safety and efficacy are unknown. In studies, groups that received growth hormone reported higher rates of adverse effects than groups that didn't. This included soft tissue edema, joint pain, carpal tunnel syndrome and excessive sweating.

Often, growth hormone and steroids are used together. Most products that are said to be growth hormone are not. A dead giveaway is the delivery system: Growth hormone can only be injected, not ingested.

## THE LAST REP

Coaches must be aware that many athletes have unhealthy muscle-enhancing behaviors. Particularly disturbing is the use of muscle-enhancing substances, especially those that are illegal such as steroids and growth hormone.

As a result, it's critical that coaches educate athletes – and their parents – about the benefits of exercising and eating properly. Discussions can begin with the topic of having a healthy body image. From there, coaches can address a wide range of subjects. This includes weight management, fad diets, food labels, food/activity diaries, eating disorders, fast foods, sports nutrition, specific muscle-enhancing substances and physical activity (such as strength training and aerobic training).

*Matt Brzycki has authored, co-authored or edited 17 books on strength and fitness including four that are devoted to wrestling. His latest book is [A Practical Approach to Strength Training \(4th edition\)](#).*