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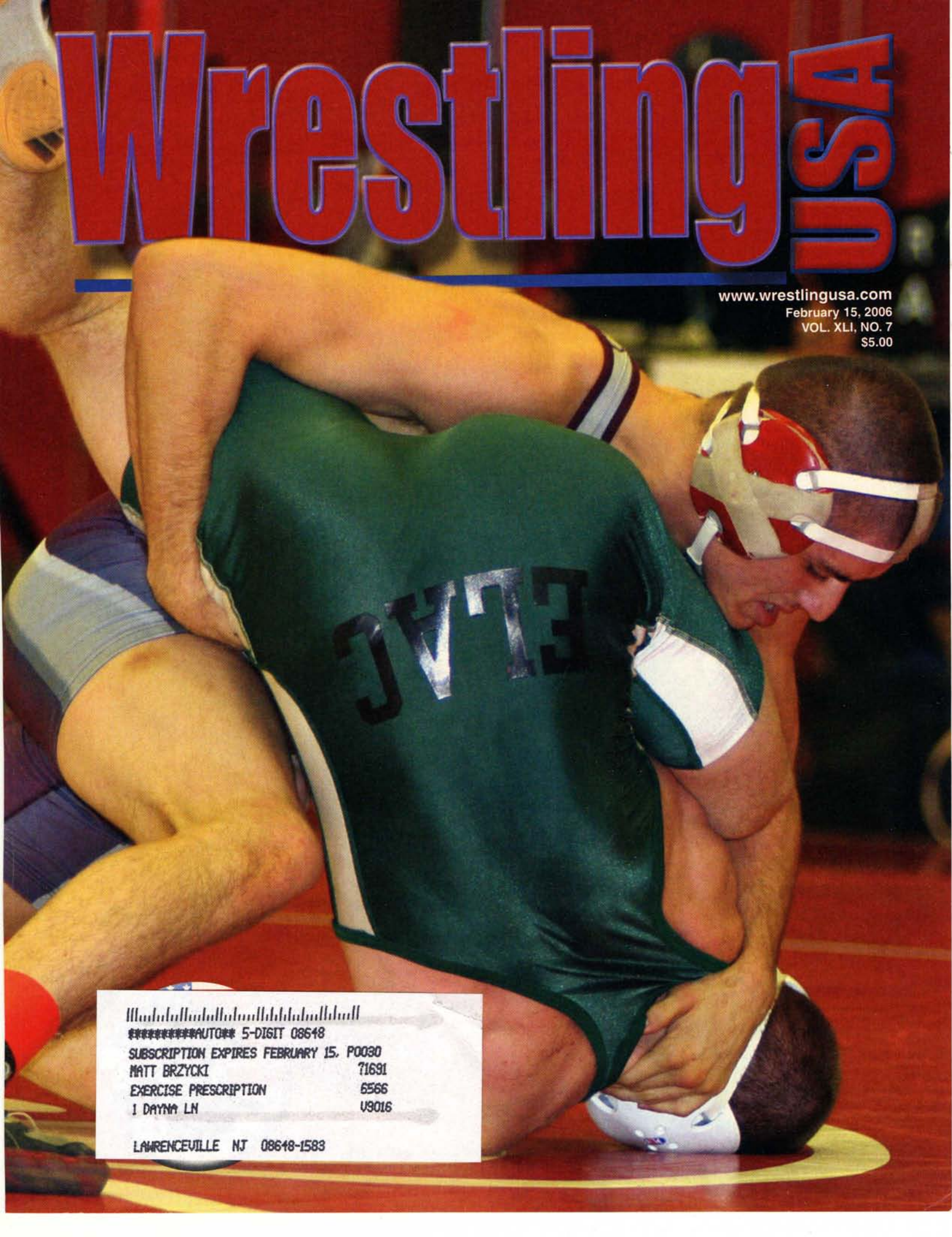
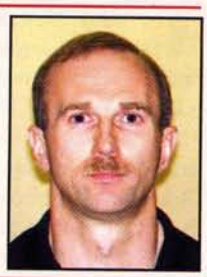


Body Image and Supplements

By Matt Brzycki



Adolescence is a period of rapid physiological, intellectual, emotional and social growth. Understandably, these rapid changes can create a great deal of confusion. As they struggle to establish their own identities during this emotionally fragile time, adolescents may develop feelings of inadequacy and many will have hang ups about their bodies.

RECENT RESEARCH

Many adolescents will be tempted to use supplements to improve their body image. A study that was published in Pediatrics (the official journal of the American Academy of Pediatrics) looked at the use of supplements by 4,237 boys and 6,212 girls (aged 12 - 18).

The researchers found that 53% of boys and 64% of girls were not satisfied with their bodies. Boys were more likely than girls to be trying to gain weight; girls were more likely than boys to be trying to lose weight. In the study, 12.3% of boys and 8.4% of the girls reported using products to improve their appearance, muscle mass or strength.

The supplements included protein powder or shakes, creatine, amino acids, hydroxyl methylbutyrate, dehydroepiandrosterone, human growth hormone and steroids. This article will examine the safety and efficacy of these supplements.

Protein

One of the most popular supplements of all time is protein. This is consistent with the aforementioned study which found that protein powders and shakes were the products that were used most often by adolescents to improve their appearance, muscle mass or strength.

Protein is necessary for the growth, maintenance and repair of biological tissues, particularly muscle tissue. As a result, many individuals think that they need to consume protein supplements in order to increase their muscle mass and strength. Research has shown that the protein needs of active individuals may be higher than those of inactive individuals. But the fact of the matter is that individuals who consume adequate calories generally obtain sufficient protein. Active individuals require and consume more calories than their inactive counterparts. With these additional calories comes additional protein. In other words, the increased protein need of active individuals is met by an increased caloric intake.

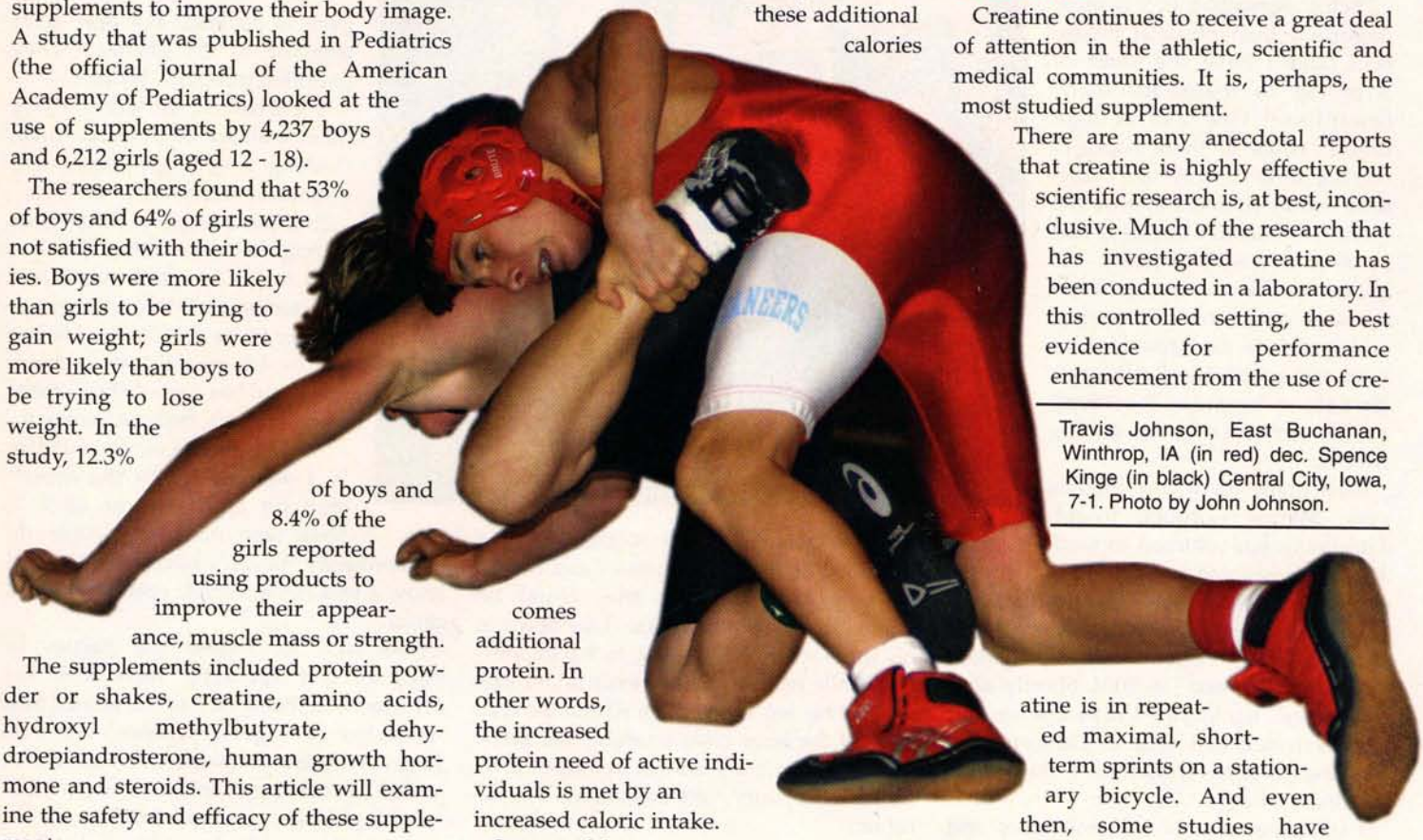
So even if the requirement for active individuals may be greater, it is likely that they are already consuming enough protein. Those who are concerned that they are not getting enough protein in their diets can obtain sufficient amounts by simply eating more foods that are high in protein.

Be advised that an excessive intake of protein carries the potential for numerous unwanted side effects. An intake of protein that is in excess of the needs for the growth, maintenance and repair of tissue is either stored as fat or excreted in the urine. When excessive protein is urinated, it places a heavy burden on the liver and kidneys and may damage those organs. An excessive 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 side effects include diarrhea and gastrointestinal upset.

Creatine

Creatine continues to receive a great deal of attention in the athletic, scientific and medical communities. It is, perhaps, the most studied supplement.

There are many anecdotal reports that creatine is highly effective but scientific research 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 from the use of creatine is in repeated maximal, short-term sprints on a stationary bicycle. And even then, some studies have shown no improvements. Of the research that has been done outside a laboratory, very few studies have shown that creatine improves performance in realistic activities such as running. In one study that involved highly trained sprinters – all were among the top ten men and women in their country in the 100- and/or 200-meter dash – creatine had no effect on single or repeated 40-meter sprint times. In some studies, creatine actually worsened performance. In



Travis Johnson, East Buchanan, Winthrop, IA (in red) dec. Spence Kinge (in black) Central City, Iowa, 7-1. Photo by John Johnson.

short, research has found that any improved performance that may occur in laboratory settings does not translate into improved performance in realistic activities.

There have not been any adverse side effects reported in studies using 20 - 30 grams of creatine per day for up to seven days. Nor have there been any adverse side effects reported in studies using smaller dosages of 2 - 3 grams of creatine per day for longer periods up to seven weeks. But here is an important point: Most studies do not include any formal way of assessing the adverse side effects. The fact of the matter is that the long-term effects of creatine supplementation are unknown. There is also a concern that many individuals typically exceed the recommended dosage, undoubtedly putting them at greater risk for incurring adverse side effects.

And while there have been no adverse side effects reported in studies that were conducted in a laboratory, there have been endless anecdotal accounts from individuals who have taken creatine and experienced adverse side effects. Although these observations are anecdotal, their sheer volume is such that they cannot be ignored. In a study that surveyed collegiate athletes who voluntarily took creatine, 73.1% reported at least one adverse side effect. The following potential side effects are of greatest concern: water retention, muscle cramping, dehydration/heat-related illness, muscle strains/dysfunction, gastrointestinal distress (such as an upset stomach, gastrointestinal pain, nausea and vomiting) and liver and kidney dyfunction.

Based upon the scientific information that is available at this point in time, it is not advisable to use creatine without the approval of a physician.

Amino Acids

The building blocks of protein are known as "amino acids." The body can manufacture most of the 22 known amino acids. The branched-chain amino acids (BCCAs) are leucine, isoleucine and valine. There is no scientific evidence that BCCAs enhance performance.

Hydroxy Methylbutyrate

A relative newcomer to the supplement ranks is hydroxyl methylbutyrate – which, thankfully, goes by the letters HMB. It is a metabolite of leucine (a branched-chain amino acid).

HMB has been promoted as a supplement to increase strength and lean-body mass, supposedly by preventing the breakdown of muscle tissue. This, however, has no scientific proof. One study did support the theory that HMB may prevent muscle damage. But the study did not examine whether or not HMB increased strength or lean-body mass. In a study that did look at this aspect, subjects who received HMB increased their upper-body strength more than subjects who received a placebo but the same was not true for their lower-body strength. Also of note is that a supplement company sponsored this study.

Research on HMB has found minimal performance enhancement in untrained individuals and almost none in trained individuals. In a study that involved 26 collegiate football players, HMB did not produce any performance benefits. It appears as if HMB is safe when taken for eight weeks or less.

Dehydroepiandrosterone

Dehydroepiandrosterone (DHEA) is a precursor to steroids and, therefore, is believed to increase the production of testosterone. This has not been proven by research, however. In one study, subjects who received a 50-milligram dose of DHEA did not increase their levels of testosterone. In another study, subjects who received 150 milligrams of DHEA per day did not improve their body composition or muscular strength.

Since DHEA is a precursor to steroids, it is no surprise that it has the potential for similar adverse effects. There are reports of hair loss, growth of facial hair and voice deepening in women as well the appearance of female-like breasts in men (which is not reversible). DHEA may also increase the risk of uterine and prostate cancer. Understand that this or any other steroid precursor could cause someone to fail a test for steroids.

DHEA is available over-the-counter; it is not subject to government regulation. Therefore, there is the potential for inaccurate dosage and impurities. Independent testing of 16 DHEA products found that only eight (50%) contained the exact amount of DHEA that was stated on the labels and the actual levels varied as much as 150%. Amazingly, three (18.75%) of the 16 products did not contain any DHEA whatsoever.

One study found that 45% of all 12th graders did not believe that taking steroids posed a great risk. They could not be more wrong.

Human Growth Hormone

It is thought that human growth hormone (HGH) can stimulate protein synthesis. As a result, HGH has attracted some attention from the athletic community.

HGH is a prescription drug. Over-the-counter products are available but they are precursors of HGH and there is no evidence that these precursors are effective at improving performance. One study that is often cited by the supplement industry used prescription HGH. The study found that HGB increases lean-body mass and decreases fat mass . . . in men who were more than 60 years old. There have been very few studies of HGH on younger individuals.

Since no legitimate studies have been published on over-the-counter HGH, its safety and efficacy are unknown. Prescription HGH has the potential for several adverse side effects including glucose intolerance and insulin resistance as well as cardiovascular conditions. Needless to say, using black-market HGH is risky business.

Steroids

Steroids are synthetic derivatives of the male sex hormone testosterone. Popular names include dianabol, nandrolone and stanozolol.

It appears as if the use of steroids increases strength and lean-body mass but not endurance. It is thought that steroids increase muscle mass by increasing protein synthesis.

One study found that 45% of all 12th graders did not believe that taking steroids

posed a great risk. They could not be more wrong. The use of steroids poses serious threats to the liver and kidneys. There are also risks to the cardiovascular system (increased blood pressure and cholesterol) and reproductive system (essentially, a feminization of males and a masculinization of females).

Even in low doses, the use of steroids has the potential to produce psychological side effects such as auditory hallucinations, extreme mood swings, sleeping disturbances, euphoria, paranoia, irritability, an increased or a decreased libido, anxiety and delusions. Perhaps the most frequently documented psychological side effect is an increased level of unpredictable hostility and aggression commonly referred to as "roid rage." Research has found that more than 80% of 12 - 17-year-olds who used steroids stated that they had acted in an aggressive way against people or had committed a crime against property in the previous year. Steroid users may also experience psychological dependency. This can lead to depression-related withdrawal when the use of steroids is discontinued.

Adolescents who use anabolic steroids may experience a pre-mature fusing of their growth plates. Closure of the growth plates before completion of the normal growth cycle will result in stunted growth (which is not reversible).

Steroid users also have a predisposition to tendon and ligament injuries. Users risk blood poisoning and the spread of communicable diseases – including HIV and AIDS – from contaminated needles as well as neural dysfunction as a result of improperly placed needles. Additionally, there is a risk of sudden death accompanying injection due to anaphylactic shock.

Other possible side effects are fluid retention, hair loss, unprovoked nose bleeds, peptic ulcers and acne. Steroid users may start using other drugs in an attempt to control the unwanted side effects. For example, they may take amphetamines to combat depression and diuretics to avoid fluid retention and lower blood pressure.

Under the Anabolic Steroids Control Act of 1990, steroids are placed in the same category as amphetamines, methamphetamines, opium and morphine. The 1990 Act was amended by the Anabolic Steroid Control Act of 2004 which became effective on January 20, 2005. The new act redefines "anabolic steroid" to mean any drug or hormonal substance, chemically and pharmacologically related to testosterone (other than estrogens, progestins, corticosteroids and DHEA). It also sets forth a list of substances to be included as anabolic steroids. Possession of steroids is punishable by imprisonment for up to one year and/or a minimum fine of $1,000 (first offense).

FOOD FOR THOUGHT

Most of the claims concerning supplements are purely speculative and anecdotal with little or no scientific or medical basis. When a variety of foods are consumed that provide adequate calories and nutrients, there is no need to take supplements. Investing money in high-quality foods is a better approach than spending it on expensive supplements. Eating appropriately and participating in a proper strength-training program will improve appearance, muscle mass and strength in a much safer manner.

Editor's Note: *Matt Brzycki has authored, co-authored or edited 13 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).*