Deceptive tactics used in marketing purported ergogenic aids

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In 1989, the National Council Against Health Fraud established a task force on ergogenic aids and athletic performance. The NCAHF is a voluntary health agency that focuses on health fraud, misinformation and quackery as public health problems. The council is comprised of health professionals, educators, researchers, attorneys and concerned citizens who actively oppose misinformation in the health marketplace. The NCAHF main office is located at Loma Linda University in Loma Linda, California.

The purpose of the task force was to evaluate performance-enhancement claims made by supplement companies for their products. The evaluation involved obtaining the product, company promotional material and advertising claims, reviewing available data, and interviewing researchers and company spokespersons. The company claims, rationale, supportive documentation if provided and the contents of peer-reviewed journals were compiled to evaluate the claims used by manufacturers of purported ergogenic aids to sell their products.

The task force has reviewed the claims made by 45 companies, most of which advertise in popular athletic and bodybuilding magazines. **Table 1** shows a list of products reviewed and claims made for them.

The main purpose of this article is not to review the findings on each supplement, but to identify the marketing strategies most firms use to sell their products. An understanding of the methods used for marketing purported ergogenic aids should assist physicians and those who work directly with athletes in objectively evaluating performance-enhancing claims and ergogenic aids.

This review will outline the nine most frequently used methods by manufacturers of purported ergogenic aids to sell everything from sarsaparilla root to organic germanium (**Table 2**). They claim everything from immediate recovery after endurance events such as triathlons, to increasing muscle mass more effectively than steroids.

Misrepresentation

Misrepresentation normally involves one of the following:

Research work. Published research work is frequently taken out of context, conclusions are

Table 1. Partial List of Ergogenic Aids Reviewed

Product	Promoted Use
Inosine	Increase energy, strength and recovery
Carnitine	Increase endurance
Dibencozide (cobalimides)	Steroid alternative; increase stamina
Organic germanium	Increase oxygen transport; strengthen immune system
Betaine	Libolytic
Chromium picolinate	Anabolic, lypolitic
Boron	Anabolic
Citrulline	Anabolic
Ferulic acid	Anabolic, antioxidant, lipotropic, decrease fatigue
Succinates	Reduce lactic acid, maintain ATP production
Tryptophan/piperidine	Lipolytic
L-phenylalanine	Stimulant to increase noradrenaline production
Nicotinic acid	Anabolic
Pyridoxine HCL	Anabolic
Co-enzyme Q-10	Optimize ATP production to increase energy and stamina
Aspartates	Increase energy
Gamma linolenic acid, eicosapentaenoic acid	Steroid alternative; increase energy/endurance
Ornithine, arginine, glycine, lysine	Anabolic
Branched chain amino acids (leucine, isoleucine, valine)	Anabolic; increase recovery; decrease muscle catabolism
Protein powder	Anabolic; increase recovery; decrease muscle catabolism
Arginine pyroglutamate/lysine	Anabolic
Mexican sarsparilla root	Increase energy, recovery, anabolic, lipolytic, steroid alternative
Sterols	Anabolic
Ginseng	Increase energy and recovery; decrease fatigue
Eleutherococcus senticosus	Increase energy and recovery; decrease fatigue
Yohimbe bark	Steroid alternative; increase energy
Gamma oryzanol	Anabolic; lipotropic; decrease fatigue
Guarana	Increase energy
Adrenal cortex extract	Increase energy
Potassium with herbs	Cure-all, do-all product
Chinese herbs	Cure-all; increase energy, recovery time and weight loss

extrapolated beyond the authors' own, or conclusions are applied in an unproven manner. For example, boron is often claimed to be an anabolic agent based on USDA studies on post-menopausal women (8).

The USDA research was conducted to "examine the effectiveness of aluminum, magnesium and boron on major mineral metabolism in post-menopausal women." The authors concluded that "supplementation of a low boron diet with an amount of boron commonly found in diets high in fruits and vegetables induced changes in post-menopausal women consistent with the prevention of calcium loss and bone demineralization."

Part of this study demonstrated that with a dosage of 3 milligrams of boron per day, testosterone increased from 0.3 to 0.6 ng/ml in post-menopausal women. The study was intended to evaluate boron's role in osteoporosis among boron-deficient women, not its role as a pharmaceutical or ergogenic aid. Regardless, a significant number of supplement companies promote boron as a natural anabolic agent based on this study, even though the level of normal male testosterone is approximately 10 times that observed in the USDA study. During a phone conversation with one of the study's authors, it was quite clear that the use of the study to promote boron as an ergogenic aid was completely unjustified.

During a phone conversation with one firm, they said that if boron was shown to increase testosterone in post-menopausal women, then it must be an effective anabolic agent. Such unwarranted

extrapolations by supplement promoters are frequent.

University tested. Some promoters claim their products have been tested at a university. If the research is legitimately financed and approved by a university, a specific professor responsible for the product can be named. If the "research" is a deceptive marketing tool, the firm will obtain the assistance of a naive staff member, such as a weight trainer or conditioning coach, to assist in coordination of the project. The firm then controls the "research" design, implementation and data analysis.

Some promoters have reported positive university research that was never actually conducted. This problem was demonstrated effectively by "Inside Edition" on KCBS-TV in Los Angeles on March 10, 1989. In this case, a report in **Muscle and Fitness** magazine stated that a study at San Diego State University demonstrated the effectiveness of amino acid supplement products compared to controls, when in fact the research was never conducted.

Many universities have a policy that disallows the use of their name for the promotion of supplements for profit.

Endorsement by professional organizations or groups. As with recognizable universities and elite athletes, the appearance of approval by professional athletic organizations is also used in marketing. A company may have a member of a professional team using its product who states that he or she believes in its effectiveness. However, the product's marketer may advertise the name of the organization for whom the individual works, with the apparent intent that the organization itself endorses the product.

In 1989, a company stated in its promotional material for organic germanium that the New York Yankees were among the "health professionals currently using" their product. The obvious intent was to have the product appear to be endorsed by the New York Yankees. When the Yankee organization became aware of the unauthorized use of its name, it notified the firm with a letter stating, "the New York Yankees organization does not intend to either directly or indirectly endorse your product," and demanded that the company cease using the team name immediately.

Ergogenic misinformation can also filter into legitimate educational clinics through guest speakers without prior authorization from clinic sponsors. For instance, the U.S. Cycling Federation sponsored a clinic where a guest speaker promoted carnitine, inosine, octacosanol, arginine, ornithine and dimethylglycine to enhance performance, despite an absence of peer-reviewed, objective substantiation that these substances are effective. When the USCF became aware of the issue, measures were promptly taken to rectify the problem.

Another type of misuse of professional organizations has been to persuade a coach to believe in a product's effectiveness and in turn use the coach's status and team identity in marketing. An example of this is the U.S. Olympic Swimming Program, where ex-Olympic swim coaches allowed the use of their names and professional positions to market a supplement as a steroid alternative with no published, double-blind, peer-reviewed studies to support those claims. The supplement firm's liberal references to U.S. Swimming in its promotional material make it appear that the U.S. Olympic Swimming Program endorses its product, when in fact it does not. The U.S. Swimming legal counsel has formally notified the firm in question "not to claim endorsement of its product by U.S. Swimming, its national teams or its coaches as a group." However, this product is endorsed by the NFL Players Association, despite the lack of published peer-reviewed research.

Currently Doing Double-blind Research

The statement "we are currently doing double-blind research" is common, but rarely true. When this answer is provided after requesting documentation to support ergogenic aid claims, rarely is a firm able to provide specific research design, number of subjects, etc.

Research Not for Public Review

The statement "research not for public review" is offensive to the consumer's right to objective documentation with regard to performance claims. There is no rational reason not to be forthright with positive publishable proof of claims.

Testimonials

These are the oldest and most popular selling technique. Testimonials are based on the placebo effect, which will account for at least a 40 percent chance of all innocuous materials resulting in positive mental or physical performance results.

John Edmeads, M.D., states that "Placebos are catalysts for the transformation of expectations to effects" (3). In sports medicine, this is illustrated in a 1972 study in which six selected experienced

Table 2. Nine Deceptive Methods Frequently Used by Ergogenic Aid Manufacturers and Distributors to Sell Products

1. Misrepresentation
   - — Researchers/research work
   - — Universities
   - — Professional organizations/groups
2. Currently doing blind research work
3. Research not for public review
4. Testimonials
5. Patents
6. Inappropriately referenced research
   - — Unpublished
   - — Eastern European
   - — Poorly controlled
   - — Outdated
   - — Taken out of context
   - — Not peer-reviewed
7. Media
8. Mail order fitness evaluations
9. Anabolic measurements

weightlifters were led to believe they had qualified to receive anabolic steroids (dianabol) under close supervision (1). However, the lifters were given placebos which, according to the author, provided "the psychological inducement to increase strength gains above and beyond reasonable progression." This study effectively demonstrated the motivational effects of placebos on weightlifting gains of experienced lifters who thought they were receiving anabolic steroids.

Buyers are strongly influenced by personal reports of how a product may help improve an athlete's performance. However, testimonials can be faked, bought or embellished by editing. Even when truthful, the alleged benefit may only be imagined (placebo) or coincidental (natural improvement). Without objective published data, testimonials are no more than the reflection of an athlete's motivation inspired by the faith he or she has put into any particular supplement.

Patents

Firms advertising that their products are patented seem to be on an increase. Consumers incorrectly assume that if a product has been granted a patent number, it must have been deemed effective by the U.S. Patent Office. The Patent Office does not concern itself with the effectiveness of a product, only with its distinguishable differences from others. Patents do not have to demonstrate efficacy and can be obtained with only a theoretical model rather than objective double-blind research. Patents may be used as nothing more than deceptive marketing gimmicks.

Inappropriately Referenced Research

There were six types of inappropriately referenced research seen: unpublished; Eastern European; poorly controlled; outdated; taken out of context; and not peer-reviewed.

Unpublished data is similar in style to research not for public review, but unpublished data can sometimes be obtained from the companies. The data we saw were so poorly controlled or used such poor methods that the conclusions drawn from them are baseless. Due to the poor quality of research, this type of work is not published or peer-reviewed due to the lack of acceptability to quality journals.

Eastern European research is often hearsay, and details are often unavailable for peer review. End results can be questioned due to the lack of controls. European countries do not have anything like the U.S. Food and Drug Administration. Product claims are presented in a "buyer beware" atmosphere, due in part to a lack of consumer protection laws (i.e., the need to prove safety and efficacy).

Poorly controlled research refers to the use of only one published preliminary report that has not been verified by further, better controlled studies with more appropriate methodology (such as with claims made for chromium picolinate) (4).

Outdated or old research, which may have been positive, is often used even though newer, better controlled research performed in the 1980s has been negative (such as with aspartates) (2, 5, 7).

Research taken out of context involves the extrapolating of

research data from conclusions and findings that have no relation to the product's efficacy. An example of this is the promotion of nicotinic acid to increase growth hormone and its purported anabolic effects. This was claimed by firms who cited a study in which the authors were evaluating the relationship between serum levels of human growth hormone and fat mobilization (6). Their conclusion was simply: "The increase in human growth hormone during exercise does not depend upon prior mobilization of fat, but such mobilization may inhibit its continued secretion." Nicotinic acid was used to suppress fatty acid mobilization in order to study human growth hormone's regulatory role. The authors neither measured nor referred to any anabolic indices.

Studies not peer reviewed are those published in variety journals, popular magazines or for direct distribution to the consumer.

Media

Mass-media methods of all kinds are used to market dubious ergogenic aids. Videos are being used increasingly because of their ability to show elite athletes in action, followed by their testimonials. Mass-media techniques involve both advertising and publicity. Advertising is recognizable as paid commercial messages with limited First Amendment protection. False and misleading claims made in advertising are subject to prosecution by the Federal Trade Commission. False labeling is under the jurisdiction of the FDA.

Publicity is communication that is not recognizable as advertising. Editorial commentary, feature articles, talk-show interviews, "news" stories planted in the press, and materials extolling products but not bearing company identification are common forms of hidden advertising in the guise of publicity. These types of communication enjoy greater First Amendment protection, but those responsible for them are vulnerable to prosecution if a conspiracy to deceive the public to sell a specific product can be proved. Unfortunately, unless there is substantial danger to the public or some other reason to attract the attention of busy regulators, violaters tend to be ignored. The rule to keep in mind is that when a product claims to prevent, alleviate or cure a physical or mental disorder, or to alter the structure or function of the body, it is classified as a drug and is subject to premarketing approval by the FDA.

Mail-order Fitness Evaluations

Mail-order fitness evaluations are promoted to provide everything from basal metabolic rates to vitamin recommendations. Mail-order computerized fitness profiles depend on the accuracy and understanding of the participants. These programs are far too subjective to provide any worthwhile data. Additionally, most of these programs are used not for their objectivity in assisting clients, but to profit from naive participants' purchases of the marketed supplements to achieve their goals.

Anabolic Measurements

Some firms rely on in-house amino acid chromotography and nitrogen balance studies to justify their product claims. Nitrogen balance measurements provide only net values of amino acid metabolism, not specific values of anabolic versus catabolic activity. Additionally, initial negative nitrogen balance will correct itself after the first few weeks of training. Positive nitrogen balance can also be achieved with increased intake of fat or carbohydrate. Thus, there is no direct correlation between increased amino acid intake and increased lean body mass.

Chromotography measurements are used before and after training sessions to determine the company-recommended amino acid supplement ratios.

A shift in amino acid concentration is a normal response, and is related to both diet and current training. The use of chromotography to validate recommendations of specified supplemental amino acid intake to facilitate muscle tissue hypertrophy has not been demonstrated. These procedures, although useful if employed properly for research purposes, do not provide tissue-specific information (i.e., change in chromotography profiles or increased nitrogen balance do not directly indicate an increase in specific body mass).

Conclusion

As a result of this study, we conclude that without stricter advertising and marketing laws, the consumer will continue to be prey to unsubstantiated advertising claims. Firms do not want to be regulated. They promote the notion that the consumer should be allowed to decide the effectiveness of a product themselves, without FDA or FTC regulation. This allows placebo effects and coincidence to operate to their advantage. In a democratic society, an open market is desirable. However, an open market based on deceit and misperception is not desirable. When a consumer decides to purchase a product, the decision should be based on fact, not unregulated misinformation.

It is not the intent of this article to suggest that ergogenic aids or supplements never have a place in

an athlete's training regimen under specific conditions. However, evidence suggests that objective information on the role of dietary supplements in athletic training is not likely to be provided by most ergogenic aid suppliers. Such information can only come through well-designed and controlled studies that are acceptable for publication in quality peer-reviewed journals. ●

Reference

1. Ariel, G. and W. Saville. 1972. Anabolic steroids: the physiological effects of placebos. **Medicine and Science in Sports and Exercise**. 4:124-126.
2. DeHann, A. et al. 1985. Effects of potassium and magnesium aspartate on muscle metabolism and force development during intensive static exercise. **Internal Journal of Sports Medicine**. 6.
3. Edmeads, J. 1984. Placebos and the power of negative thinking. **Headache**. November: 342-343.
4. Evans, G.W. 1989. The effect of chromium picolinate on insulin controlled parameters in humans. **International Journal of Biosocial Medicine and Research**. 11:163-180.
5. Hagen, R.D. et al. 1982. Absence of effect of potassium-magnesium aspartate on physiological response to prolonged work in aerobically trained man. **International Journal of Sports Medicine**. 3:177.
6. Hartog, M. et al. 1967. The relationship between changes in serum levels of growth hormone and mobilization of fat during exercise in man. **Quarterly Journal of Experimental Physiology**. 52:86-96.
7. Maughan, R.J. and D.J.M. Sadler. 1983. The effects of oral administration of salts of aspartic acid on the metabolic response to prolonged exhausting exercise in man. **International Journal of Sports Medicine**. 4:119.
8. Nielson, F. et al. 1987. Effects of dietary boron on mineral, estrogen, and testosterone metabolism in postmenopausal women. **FASEB Journal**. 1:394-397.