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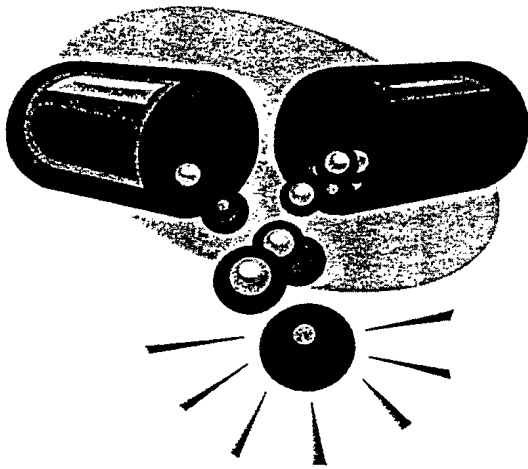




Newsletter

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NUTRITIONAL ERGOGENIC AIDS: DO YOU KNOW WHAT WORKS AND WHAT DOESN'T?

Throughout my 20-year career in exercise physiology research I regularly receive requests for information and guidance on a variety of topics related to how human physiological systems respond to exercise, training and dietary manipulations. During the last 5 years, however, I have noticed an absolutely astounding increase in requests for information about the efficacy of drugs and nutritional supplements which are purported to be ergogenic aids. What is most surprising is that the bulk of the

questions do not originate from competitive athletes, but from recreational fitness enthusiasts like the ones who work out regularly at fitness clubs. For those not familiar with the term, an ergogenic aid is defined as a drug, nutritional supplement or physiological procedure that enhances some component of physical fitness leading to an improvement in physical performance. This article will only deal with nutritional supplements.

Ira Jacobs, Dr. Med. Sc.,
January 1998

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FALLING FOR MARKETING & PRODUCT PROMOTION

Why the increased interest in such supplements? I suspect it has something to do with the tremendous growth in the commercial food supplement industry and the related massive marketing. For example, I bought a recent issue of one of the more popular men's fitness and training magazines and counted advertisements for 157 different nutritional supplements in 120 pages. The advertisements typically show the product being promoted next to photographs of beautiful bodies or big muscles (I hope you notice that I did not equate the

two). It wouldn't surprise me if many combat personnel, who have a personal stake in maintaining a high level of physical readiness, read such magazines in an attempt to educate themselves about things that will affect their fitness and physical work capacity.

Back to the myriad of related questions I receive.

THE QUESTIONS

The questions about nutritional ergogenic aids can be grouped into three general types:

1. Will a specific supplement improve fitness or some fitness component?
2. Will a specific supplement improve health, or reduce susceptibility to illness or disease in an otherwise healthy individual?
3. Will a specific supplement "improve" body composition? This last question usually translates into "will the supplement increase muscularity or reduce body fat content."

There isn't enough space available in this article to review everything that is purported to be effective, but examine the table for only a partial listing. Do you know which products have been unequivocally proven to be effective, which have been proven to be ineffective and which have not yet received sufficient research attention to facilitate any deci-

PARTIAL LISTING OF "PURPORTED" NUTRITIONAL ERGOGENIC AIDS

Amino acids
Bee pollen
Beta-sitosterol
Boron
Branched chain amino acids
Caffeine
Carnitine
Chromium Picolinate
Citrulline
Coenzyme Q₁₀
Creatine
Desiccated liver
Dibenzozide (cobalamide)
Eicosanoids
Ferulic acid
Gamma-hydroxy butyrate
Gamma oryzanol
Ginseng
Glandulars
Glucose polymers
Inosine
Medium chain triglycerides
Octacosanol
Omega-3 fatty acids
Pangamic acid
Smilax (sarsaparilla)
Sodium bicarbonate
sodium phosphate
Succinate
Tryptophan
Vanadium
Vitamins
Wheat germ oil
Yohimbe

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sion? I do, but only because I have spent the kind of time which most of you don't have, to review the scientific evidence that is available in order to make an objective evaluation of the claims made by supplement manufacturers. A few of the products in the table are very effective, many are ineffective, and for many more there is insufficient or no empirical evidence (i.e. real, hard data) to support claims made by manufacturers.

OBJECTIVE SCIENTIFIC SUPPORT

How do I arrive at conclusions about efficacy? The "scientific method" makes it relatively easy for me to evaluate claims. I would deem a nutritional ergogenic aid to be effective if there are several studies published in reputable scientific journals that document the efficacy in human subjects. All too often nutritional supplement manufacturers base their marketing on theoretical events that might occur in a test-tube or in studies on animals which may be very poor models of how humans would respond to the same treatment. Moreover, the only studies I will consider as being of value are those carried out in a very controlled fashion in order to reduce the probability that any observed positive effects were not the result of chance rather than due to an effect of the supplement. In scientific jargon, the experiments must be carried out using a "double-blind, placebo-con-

trolled experimental design". This means that a placebo would have to be used for some of the trials to be sure that any observed effects are not simply due to chance; also, during the actual experiments neither the experimenter nor the subjects being tested can be aware of which treatment the subjects are receiving. Only after the study would a code be used to determine which trials involved placebo and which involved the actual supplement.

BEWARE OF "QUACKERY"

To carry out research studies in the manner described above can be expensive and time-consuming. Thus the nutritional supplement industry is notorious for product promotion based on anecdotal evidence, personal testimony or individual case reports. This is tantamount to "quackery." Here is a list of commonly used tactics to promote a supplement; if you identify several of them with regards to the promotion of a supplement you are considering, or about which you are asked, then be very, very wary:

1. Quick, dramatic, improvements promised with little extra effort required.
2. The use of personal anecdotes or testimonials, or individual case reports to support claims.
3. The use of pseudoscientific expressions, for example instead of stating that a supple-

ment will have a very specific physiologic effect there might be statements like "...enhance your immune system" or "stimulates an anabolic effect."

4. Dubious credentials of individuals associated with the product, e.g. unaccredited schools.
5. Claim that a supplement was discovered in another part of the world and is not yet accepted in North America.
6. Suggestion that difficulty in inducing further fitness improvements, or most illness and disease is because of a faulty diet that can be rectified with supplements.

SOURCES OF RELIABLE INFORMATION

There is a massive amount of information and misinformation on the topic of ergogenic aids. Here are some other sources of objective information about the effects of nutritional supplements on fitness and physical performance of healthy individuals.

1. **The Canadian Society for Exercise Physiology (CSEP).** CSEP is the national professional association for Canadian exercise physiology scientists. Many of its members are scientists at universities across the country engaged in related research. The CSEP national office should be able to refer you to one of its members



who would be knowledgeable about the benefits of a purported nutritional supplement. CSEP publishes a peer-reviewed scientific journal, *Canadian Journal of Applied Physiology*, which frequently contains related articles. CSEP can be contacted at their national office, telephone (613) 234-3755.

2. **MEDLINE & the Internet.** If you have access to the Internet then try to find a link to Medline, which is a searchable index service for scientific articles published in reputable medical and biological sciences journals. DO NOT expect to access reputable information about a product if you just use a standard web browser search engine; the sites you will find are frequently maintained by a product manufacturer or distributor.

3. **The International Journal of Sports Nutrition.** This is currently the only English language, peer-reviewed scientific journal that is dedicated to the interaction of nutrition, exercise and physical performance. It is published by Human Kinetics Press. If you are really serious about nutrition, exercise and physical performance, then regular perusal of this journal is a must.

4. **Books.** There are many books on the topics described in this article, but only a few which document the empirical

evidence about the efficacy of nutritional supplements. A recent one that I highly recommend because of its scope and easy readability is *The Ergogenic Edge*, by Dr. Mel Williams. Human Kinetics Press published it within the last couple of months.

5. **Defence & Civil Institute of Environmental Medicine (DCIEM).** DCIEM is one of the labs that is an integral component of the Department of National Defence (DND's) Research & Development Branch. It has an active research programme in ergogenic aids. One of the physiologists there should be able to provide you with objective advice, or know where to get it. Unfortunately, be prepared for the response that I have to give to many such questions: i.e. that there is no good scientific evidence in support of the claims made by product promoters, so don't waste your money on purchases of such products.

6. **Medical Officers (MOs).** Documentation on ergogenic aids has been prepared and is now distributed to MOs during their Basic Medical Officers Course. It provides background information and summaries about the efficacy of many purported ergogenic aids. Your MO can obtain such documentation from DCIEM if they do not have it available. ■

Safer Sex

If something were free, readily available, easy to use, and the smartest move you could make, would you use it every time? With all of these advantages, it's hard to believe anyone would say "No".

Yet those who need them most often leave condoms - which fit the bill on every account - on the shelf. Younger, unmarried Canadian Forces (CF) members who have more than one sex partner are at increased risk of contracting sexually transmitted diseases (STDs). In spite of this, CF health surveys show that more than 20 % of members in this group never use a condom during sexual intercourse and nearly 60 % use a condom only sometimes.

In the age of Acquired Immunodeficiency Syndrome (AIDS), this is hard to believe. Human Immunodeficiency Virus (HIV) is a STD, and HIV leads to AIDS. And, as we all know, there is no cure for AIDS.

