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**3/6<sup>TH</sup> Cavalry Flight Surgeon**



# OBJECTIVES

- ✓ Define Supplements
- ✓ Reasons for Using Them
- ✓ Supplements vs. Ergogenic Aids
- ✓ Review of Specific Supplements
- ✓ Flying and Supplement Use

A blue-tinted photograph of a vast ocean under a cloudy sky. The text "TEST TIME!" is centered in white, bold, sans-serif font.

**TEST TIME!**

# Q#1: What is a Supplement?

- A. Hof @ Crystals in the Ville
- B. Any product that contains a vitamin; a mineral; an amino acid; an herb or other botanical; or a concentrate, metabolite, constituent, extract or combination of any of these ingredients, not a food or drug.
- C. Buy me Juice...

## Definitions

- **Food**- substance used for food or drink for man or animals; consumed for taste, aroma or nutritional value.
- **Drug**- substance intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in man or other animals.

Q#2

WHO CARES?!

Clue: 3 letters



**F.D.A.**

**(AKA – Food and Drug Administration)**



There are **NO** federal guidelines on the manufacturing process, marketing claims, purity, safety or efficacy of Supplements!

# Dietary Supplement, Health and Education Act of 1994

- Bottom Line: Manufacturers are responsible for their own products!!
- For example: ODESHI, etc.
  - can collect DIRT, STOOL, URINE from the Ville, place it in a capsule, and sell it to young GI for 50,000 WON
  - can place elicited substances (cocaine, steroids, heroin, etc.) in a capsule;
    - then OOPS call at 0400 for PEE test
    - then BUSTED
    - then you'll see me for the Finger wave





# Precautionary Notice

Valued Customers,

- AAFES urges you to *follow all dietary supplement label instructions and warnings* to include recommended serving sizes and frequencies.
- Taking more of the supplement than the label directs may cause medical problems and *will not* increase benefits.
- *Consult your health care provider* if you are taking any prescription or nonprescription drugs or are undergoing examination/treatment for any illness or disease condition.
- *Stop* taking any dietary supplement and consult with your health care provider if you are experiencing headaches, dizziness, visual disturbances, sleeplessness, loss of appetite, nausea or any other unusual symptoms.

Dietary supplements include: vitamins, minerals, energy enhancers, diet pills/formulations, herbs, weight gain/body building formulations. Several supplements may interfere with certain medications or aggravate existing medical conditions. Your health care provider needs to know which dietary supplements you are taking or planning to take.

Pregnant or nursing mothers should also consult with their health care provider prior to use of these products. Some dietary products are intended for use only by persons 18 years or older (again, please read all labels carefully).

For additional information or to REPORT adverse side effects and problems directly to the manufacturer, call the 1-800 number listed on the label. You may also report to the Food and Drug Administration (FDA) by calling 1-800-FDA-1088 or by Internet: ([www.fda.gov/medwatch/reports/hcp.htm](http://www.fda.gov/medwatch/reports/hcp.htm)). AAFES also requests any problems be reported to store management.

**AAFES**  
Army & Air Force Exchange Service



Why Do We Use Supplements?

**SPECIAL COLLECTOR'S EDITION**  
**MUSCLE & FITNESS**

**FREE  
ARNOLD  
POSTER**

**ABS &  
ARMS**

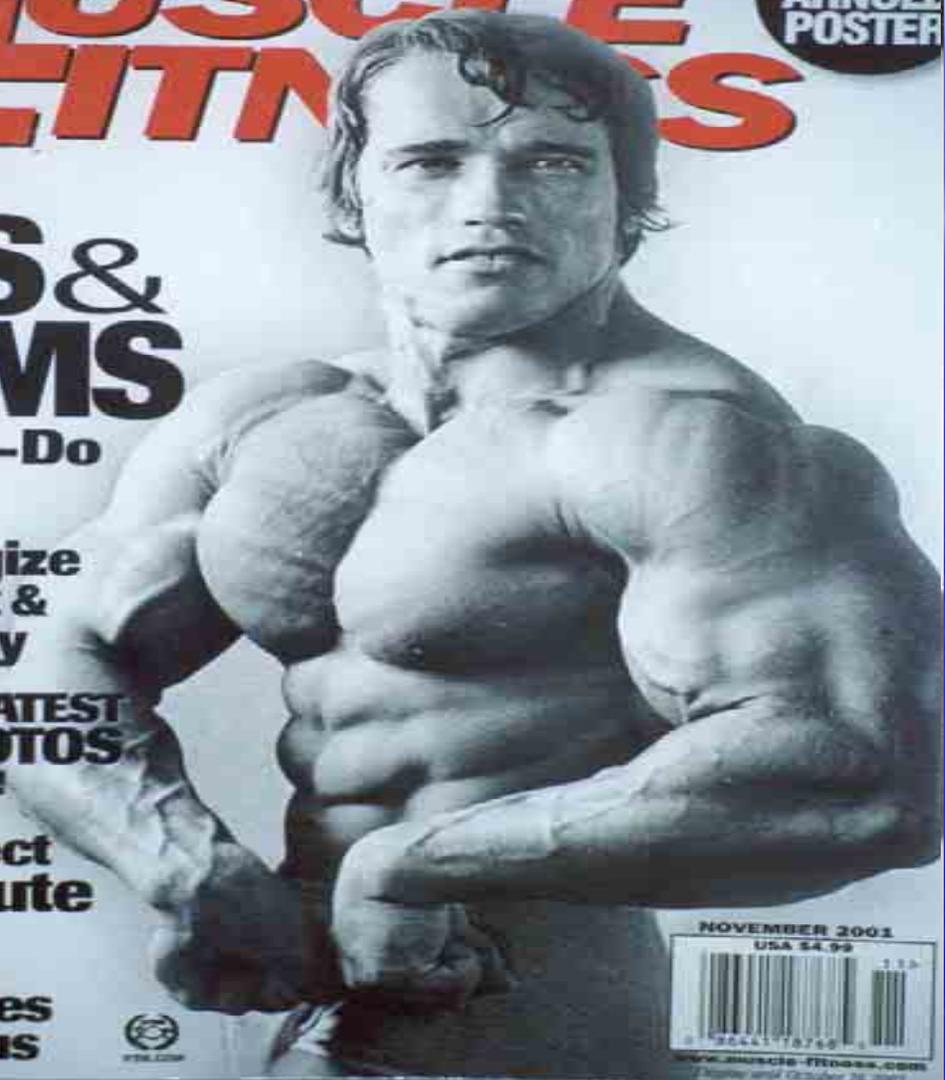
**5 Must-Do  
Exercises**

**How to Energize  
Your Diet &  
Your Body**

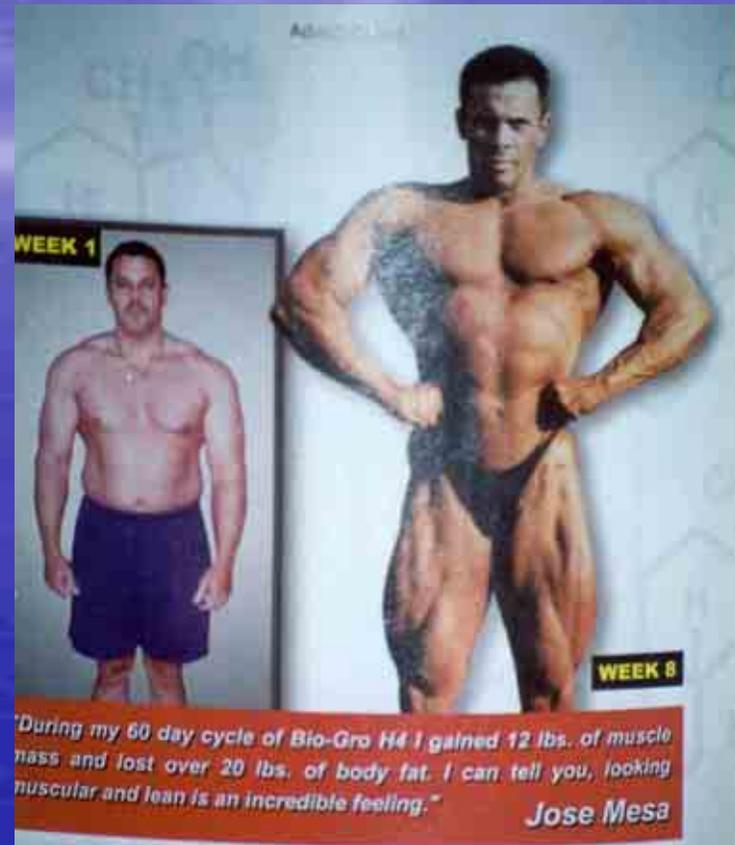
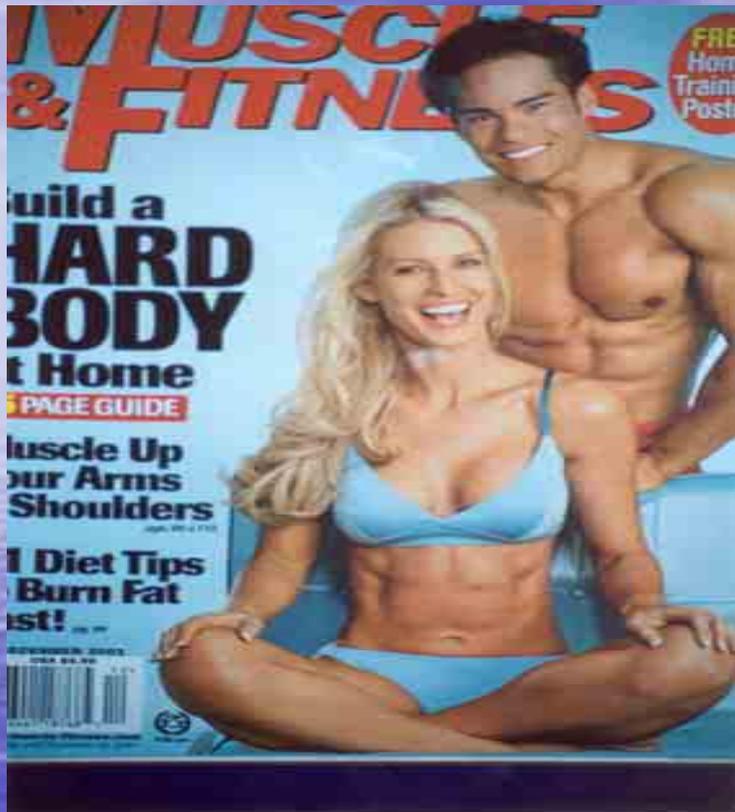
**10 GREATEST  
PHOTOS  
ALL TIME!**

**The Perfect  
10-Minute  
Workout**

**Best Bodies  
Campus**



NOVEMBER 2001  
USA \$4.99  
111  
www.muscle-fitness.com  
Expires until October 26, 2001



Always used  
with **Cellaburn**



Bodybuilding  
magazines

### Gain Muscle!

After 10 years, products  
become popular  
to burn fat  
temperature slightly  
susceptible to  
anabolic  
not surprising  
use thermogenic  
This is one of  
properties of  
in the gym means  
t of you know,  
for muscle growth.

Cellaburn  
should use  
anabolic

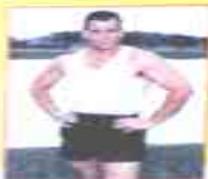
instantly in loss of pounds  
of bodyfat and added eight pounds of muscle.

**Cellaburn** made me invisible in the Super Bowl and  
the Super Bowl. Strength, speed, definition, and  
definition. Whether you're looking for  
a better body.

### Bernie Sulfaro



BEFORE



AFTER

Restored 100 lbs. Massages lost 105 lbs. and  
gained 8 lbs. muscle mass.

**AT-FS LABS**  
ANABOLIC FITNESS SCIENCE



**GUARANTEED SUPER FAT LOSS GAIN MUSCLE**

## inches Don't Cut It!

You can do all the  
fasting, but you  
won't lose the  
fat. **Thyre-Slim**  
is the only  
thermogenic  
component form,  
burns fat 24 hours  
a day!

**Thermogenics** - New research shows  
thermogenics can greatly increase  
fat loss. **Thyre-Slim** combines  
thermogenics (Mefenamic  
acid) with a proprietary adrenal

Contains guggulsterones and other  
soothing thermogenic T-3 complex,  
HCA and Chromium to  
and curb your hunger.

**Diuretic** - Contains a powerful  
diuretic blend of furosemide,  
and caffeine.

Formula is stimulant free and  
continues to burn fat with its  
fat.

**maxperformance.com**  
Call 1.888.783.8844  
Fax 1.973.785.9055

**the competition can't cut it!**

Results	Thyre-Slim	Other Thermogenics	Other Fat Burners
Increases Metabolism	✓	✗	✗
Increases Energy	✓	✗	✗
Increases Fat Burn	✓	✗	✗
Increases Muscle Mass	✓	✗	✗
Increases Energy	✓	✗	✗
Increases Fat Burn	✓	✗	✗
Increases Muscle Mass	✓	✗	✗

Research is based on studies of guggulsterones, furosemide, and Chromium. © 2005 Max Performance, Inc. All Rights Reserved.

**Thyre-Slim AMVM** is a revolutionary fat burner with all  
natural thermogenic and adrenal support  
compounds. **Thyre-Slim** delivers speed of rapid  
thermogenics with the additional benefit of burning your  
metabolism, curbing your appetite, and helping with  
weight loss. No other fat burner cuts it like **Thyre-Slim**!

Available at home and after the health food store too!

# Manufacturer's Claims

- Improved well being
- Antianxiety
- Antidepressant
- Improve sleep
- Boost memory
- Improved blood flow
- Reduces cold symptoms
- Appetite suppressant
- Weight loss (burn fat)
- ENHANCE PERFORMANCE
- Improved sexual potency
- Increased sperm count
- Increased breast size
- Shrink prostate
- Improved wound healing
- Pain reliever
- Boost immune system
- Increased energy
- Weight gain (muscle mass)

# Information Sources

- Magazines 62%
- Books 33%
- Friends 28%
- Television 26%
- Health Care 27%
- Physicians 25%
- Prof. Journals 16%
- Internet 12%



...claim to enhance sports performance...

American Academy of Family Physicians  
Family Practice | Clinical Info | CME | Practice Management  
About the AAFP | Products & Services | Careers | Publications

Search:  [go](#) more options

American Family Physician  
PUBLISHED BY THE AMERICAN ACADEMY OF FAMILY PHYSICIANS MARCH 1, 2001

CLINICAL OPINION

## Ergogenic Aids: Counseling the Athlete

DALE M. AHRENDT, M.D.,  
San Antonio Military Pediatric Center, San Antonio, Texas

Numerous ergogenic aids that claim to enhance sports performance are used by amateur and professional athletes. Approximately 50 percent of the general population have reported taking some form of dietary supplements, while 76 to 100 percent of athletes in some sports are reported to use them. Physicians can evaluate these products by examining four factors (method of action, available research, adverse effects, legality) that will help them counsel patients. Common ergogenic aids include anabolic steroids, which increase muscle mass. These illegal supplements are associated with a number of serious adverse effects, some irreversible. Creatine modestly improves athletic performance and appears to be relatively safe. Dehydroepiandrosterone and androstenedione do not improve athletic performance but apparently have similar adverse effects as testosterone and are also banned by some sports organizations. Caffeine has mild benefits and side effects and is banned above certain levels. Products that combine caffeine with other stimulants (e.g., ephedrine) have been linked to fatal events. Protein and carbohydrate supplementation provides modest benefits with no major adverse effects. (Am Fam Physician 2001;63:913-22.)

 A PDF version of this document is available. [Download PDF now](#) (10 pages / 99 KB). [More information on using PDF files.](#)

[See editorial on page 842.](#) Ergogenic aids are substances or devices that enhance energy production, use or recovery and provide athletes with a competitive advantage.

Numerous products claim to bolster strength or endurance in sports. In 1996,

# Ergogenic Aids vs. Supplements

Anabolic Steroids

Androstenedione

DHEA

Creatine

Ephedra

Caffeine

Protein/ A.A.

Carbohydrates

St John's Wort

Kava

Echinacea

Ginseng

Saw Palmetto

Ginkgo Biloba

Willow Bark

Yohimbe

# Supplements in Perspective

## Predictors of Appearance and Performance

- Genetics
- Exercise Program
- Diet
- Rest/Recovery
- Supplements

# Reality Testing Your Supplements

- 1. Action. How does it work?
- 2. Research. Scientific studies to support it?
- 3. Side Effects. Most common, most serious?
- 4. Legal. "Honestly, I never inhaled...."
- 5. \*\*Would Major Resler use it?

# ANABOLIC STEROIDS

- **Illegal**
- **Harmful**
- **DON'T USE THEM!**

-Any Questions!!!!

# ANABOLIC STEROIDS

- **1. Action.** Testosterone derivatives
  - Make Protein -> Muscle
  - Directly induces skeletal muscle synthesis
  - "Steroid Rush"-euphoria, decreased fatigue
- **2. Research.** Yes...they work!!
- **3. Side effects.** Oh yeah...!!!!!!
- **4. Legal?** By prescription only.
  - *Illegal* for performance enhancement.

**TABLE 2**  
**Reported Side Effects of**  
**Anabolic Steroids**

**Reversible side effects**

**Sexual effects**

→ Increased or decreased libido

→ Decreased sperm production

→ Scrotal pain

→ Gynecomastia

→ Cutaneous effects

→ Acne

Hirsutism

Edema

**Psychiatric effects**

Euphoria

Nervousness

Aggression

Personality disorders

**Other**

Increased transaminases

Nausea

Increased

**Serious and irreversible side effects**

Hypertension from mineralocorticoid effects

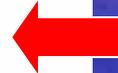
Dysplastic changes in collagen fibrils, resulting in severe tendon ruptures

Liver tumors (hepatocellular carcinoma, hepatic adenoma, hepatic cholangiocarcinoma)

Psychosis (i.e., "steroid rage")

Irreversible hirsutism, clitoral hypertrophy and deepening of voice in women

Premature closure of growth plates, causing shorter stature in adolescents

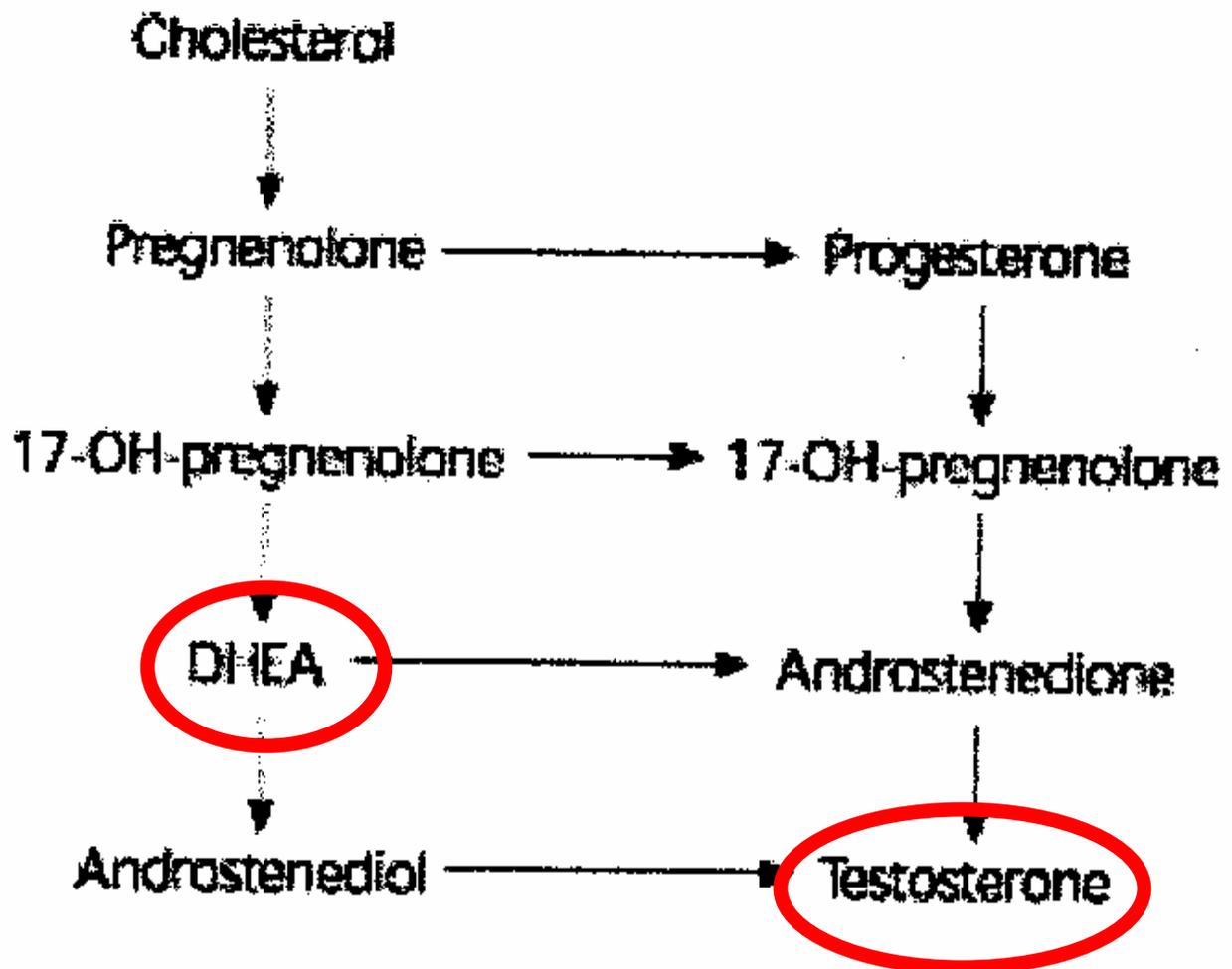


# DHEA/Androstenedione

- **1. Action.**
  - Precursors to testosterone.
  - **THEORETICALLY**, cause a physiologic increase in testosterone.

**Natural**

# Steroid Synthesis Pathway



**FIGURE 1.** Pathway for testosterone synthesis. (DHEA =

# DHEA/Androstenedione

- **2. Research.** Doesn't work.....
- **3. Side Effects.** Not much.
- **4. Legal.** Yes, but.....



# CREATINE

- **1. Action.**
  - Replenishes phosphocreatine for ATP synthesis (Energy Building Block)
  - More ATP = less fatigue = shorter recovery = more exercise  
**= MORE MUSCLE.**
- **2. Research. Shows BENEFIT.**
  - Not effective after age 60
  - No long term use studies.
- **3. Side effects.**
  - Weight gain
  - No other consistent side effects.
- **4. Legal. Yes!**

# CREATINE

- Loading dose:
  - 20 grams daily divided in 4 doses for 5-7 days
- Maintenance dose
  - 5 grams daily
- Creatine monohydrate is better.

# CAFFEINE

- **1. Action.**
  - Enhances muscle contractility, metabolize fat, CNS stimulant.
- **2. Research.** *some BENEFIT*
- **3. Side effects.**
  - \*Restlessness, nervousness, insomnia, tremors
  - hyperesthesia, diuresis.
- **4. Legal.** Yes

## Q#3 What is Ma Huang?

- A. The Olympia Club's Oshema
- B. Chinese herb in many wt loss/energy products
  - with over 40 deaths and 800 adverse reactions
  - currently banned by the IOC, NFL and NCAA
  - Active ingredient in this herb is ephedra.
- C. A Male's most precious possession

# EPHEDRA

- **1. Action.**
  - Sympathomimetic agent!
  - CNS stimulant, constricts blood vessels, increase heart rate, suppresses appetite, delay fatigue.
  - Chemically similar to amphetamine!
- **2. Research. *some* BENEFIT**
  - Prolongs time to exhaustion (with caffeine)
  - Alone...no benefit.

# EPHEDRA

- **3. Side effects.** Look out!!!
  - Nervousness, tremors, tachycardia, hypertension, arrhythmias
  - **DEATH....**
- **4. Legal.** Yes...with guidelines.
  - No > 8 mg in 6 hours, no > than 24 mg in 24 hours
  - Not > 7 consecutive days
  - DON'T use in combination!!

Adverse Questionnaire (IOM Exhibit 910-D) - Additional Comments

Complaint Number: CFSAN Project #12485

Investigator: Nianna M. Capalia

Date: August 28, 1997

\*The following comments correspond to questions listed in the Adverse Questionnaire.

**Information on Adverse Reaction**

Describe the adverse event (including symptoms and the time lapse from using product to onset of symptoms):

*The following information is what I learned from Mr. [REDACTED] attorney for Ms. [REDACTED] Ms. [REDACTED] is widow to Mr. [REDACTED] who died after ingesting TWINLAB® Metabolic Enhancer Ripped Fuel.*

On the morning of 1996, Mr. [REDACTED] drank a cup of coffee, then ingested Ripped Fuel [REDACTED] then went outside for his morning jog. He [REDACTED] he did not [REDACTED] appeared a [REDACTED] the floor

**...on the morning of his death...  
had a cup of coffee,  
and then 2 capsules of Ripped Fuel**

capsules I [REDACTED]  
workout on an [REDACTED]  
morning of his death [REDACTED] coffee, and then two capsules [REDACTED]  
followed by jogging outside [REDACTED]

# NFL bans ephedrine after problems found

The Associated Press

NEW YORK — The NFL has banned the stimulant ephedrine after being told by experts that the substance often found in strength-building food supplements can cause seizures, strokes and even death.

The ban will be part of the league's anti-steroid policy, which means that players will be subject to year-round random testing for the substances.

But commissioner Paul Tagliabue, who announced the policy Thursday in a meeting to the 31 teams, said the testing will begin until further consultations with the NFL Players Association, which has opposed the ban but not the timing.

## NFL notes

"This strengthens our policy response to the recent introduction of new substances, as well as new evidence addressing the risks associated with certain products already on the market," Tagliabue said.

Ephedrine, an amphetamine-like stimulant, is sold in a few over-the-counter asthma medications approved by the U.S. Food and Drug Administration. Under a 1994 federal law, the FDA does not test dietary supplements before they are marketed. Ephedrine's herbal form, ephedra, is an ingredient in about 200 supplements used for weight loss, building muscle or boosting energy, and occasionally in large doses as an "herbal high."

A report in the *New England Journal of Medicine* last November said that at least 54 deaths and about 1,000 reports of complications have been linked to the popular bodybuilding supplement since the mid-1990s. The FDA has since said about 80 deaths have been associated with ephedra.

The NCAA and International Olympic Committee have long had ephedrine on their lists of banned substances.

...can cause seizures, strokes, and even death

# PROTEIN / AMINO ACIDS

- **1. Action.**
  - Building blocks of muscles.
  - Promotes positive nitrogen balance which enhances muscle growth, decrease fatigue.
- **2. Research.** optimum amount needed
  - 1.8 grams per kilogram of body weight
  - Less=negative nitrogen balance
  - More=wasted money!!

## Amino Acids: Supplements vs. Food

	<u>Valine</u>	<u>Leucine</u>	<u>Isoleucine</u>
2 amino acid pills	200	280	175
1 cup macaroni	290	450	250
8 oz skim milk	550	800	500
3 1/2 oz tuna	1300	1920	1200

# PROTEIN / AMINO ACIDS

- **3. Side Effects.** None, if kidneys normal.
- **4. Legal.** Yes!

# CARBOHYDRATES

- **1. Action.**
  - Body's major reservoir of rapidly available energy.
- **2. Research. Lots!**
  - Carbohydrate supplements increase endurance
  - Timing and amount is important.
    - Exercise less than 1 hour...no benefit.
    - Intake less than 1 hour before...no benefit
    - benefits during long distance running.
    - Weight Training- Benefits if taken within 2 hours

# CARBOHYDRATES

- **3. Side Effects.**
  - Gas....Cramps
  - May affect insulin level.
- **4. Legal.** What do you think?

# FLYING AND SUPPLEMENTS

- AR 40-8 Temporary Flying Restrictions Due to Exogenous Factors
- APL-Medication Use
- Bottom Line: Flight Surgeon Rules !!

# CONCLUSION

- **Safety Concerns**

- Lack of quality control, standardization
- Health Risks
- Contaminants or Adulterants:
  - Pesticides Microbial contamination, Molds , mycotoxins, Filth
  - Drugs, chemicals

- **Performance enhancement**

- May be enhanced by some supplements, however
  - Cost vs. benefit vs. health risk must be weighed
  - Must be chosen carefully and used correctly
- Keys to success
  - some Genetics
  - A balanced diet
  - **HARD WORK** through a good exercise regimen