



VITAMINS  
MINERALS  
&  
SUPPLEMENTS

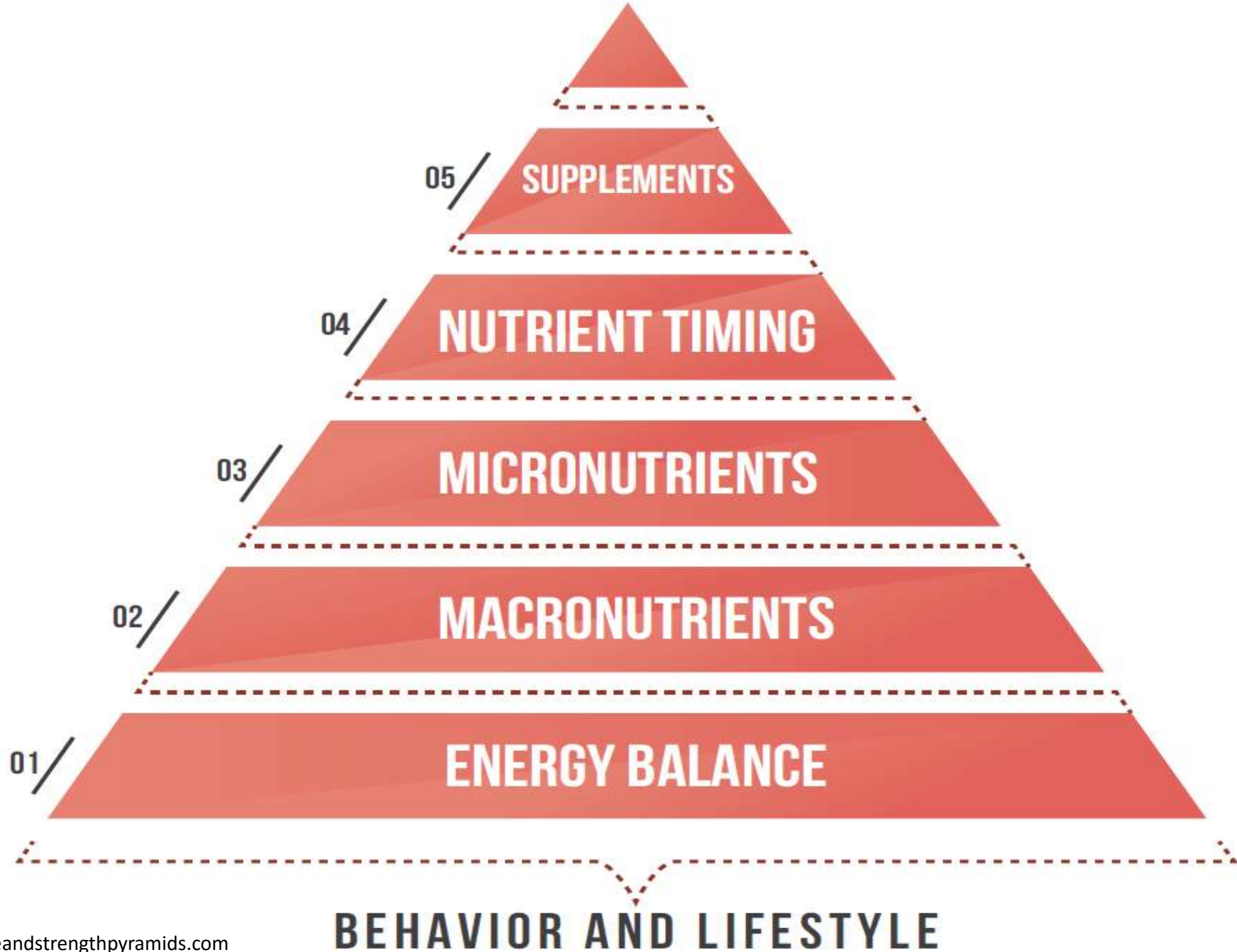
# GOALS

- To assist you in making informed choices regarding dietary supplements **using evidence-based research**
- “Go to” for questions and concerns about supplement use

A top-down view of a wooden surface covered with a variety of fresh produce. In the upper left, there are several dark red and purple plums. Next to them are a bright red apple and a yellow-orange pear. A large bunch of dark purple grapes is the central focus. To the right of the grapes are a large red tomato, a red onion, a red bell pepper, and a dark purple eggplant. In the lower right, there are green asparagus spears, a bunch of fresh green parsley, a green apple, and a piece of green melon with a netted rind. The wooden background has a natural grain and some dark spots.

OUR PHILOSOPHY

Food First



# THE INDUSTRY

More than **half of American adults** use dietary supplements.<sup>1</sup>



In 2010, the U.S. supplement industry grew 4.4%,  
reaching **\$28 billion** in consumer sales.<sup>2</sup>



# Some Supplement Stats



Unlock the Power of Science to Optimise Performance



@jeukendrup

[www.mysportscience.com](http://www.mysportscience.com)

**40-70%**

of athletes use supplements

**10-15%**

of supplements contain prohibited substances

**80%**

did not contain what the label said\*

**LARGE%**

is not backed by evidence

# COLLEGE STUDENTS SUPPLEMENT USE

- General US population - 50% report regular use
- College Students - 66% use one at least once a week
- 12% consumed 5 or more supplements a week
- Why?
  - to promote general health
  - provide more energy
  - increase muscle strength
  - enhance performance



# FDA REGULATIONS

- Supplements are largely unregulated – can contain unknown components that are dangerous and possibly harmful as well as illegal
- Do not check supplement efficacy
- Do not check supplement quality



# FDA REGULATIONS

<https://youtu.be/WA0wKeokWUU>

# THE DR. OZ WEIGHT LOSS TRIAD

Super Value Bonus Buy!

## RASPBERRY KETONE



ADVANCED WEIGHT LOSS FORMULA\*  
WITH RASPBERRY KETONE

## KetoneRX™

- Significant, sustained weight loss\*
- Energy and stamina\*
- Increased sensation of satiety\*
- Automatically curbs cravings\*



Dietary Supplement

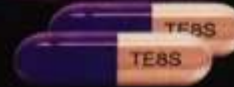
84 capsules

AN INTRAMEDIC RESEARCH GROUP, LLC FORMULATION

## GARCINIA CAMBOGIA COMPLEX

ADVANCED WEIGHT LOSS FORMULA\*  
WITH GARCINIA CAMBOGIA

## GarciniaRX™



Dietary Supplement

84 capsules

AN INTRAMEDIC RESEARCH GROUP, LLC FORMULATION

33% More! Super Value Bonus Buy!

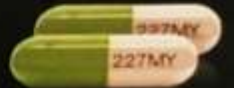
## GREEN COFFEE EXTRACT



ADVANCED GREEN COFFEE BEAN EXTRACT  
WEIGHT LOSS FORMULA\*

## JavaSLIM™

**CLINICALLY PROVEN** significant  
reduction in actual body  
mass index (BMI)\*



Dietary Supplement

80 capsules

AN INTRAMEDIC RESEARCH GROUP, LLC FORMULATION

# PROTEIN POWDER SCAMS

- Dramatic increase in whey protein price since 2009
- Padding whey protein powders with amino acids that will throw off quality control tests (a.k.a nitrogen spiking)
- Look for the following in the ingredients list
  - Arginine (3x more nitrogen than whey)
  - Glycine
  - Creatine (1.5x more nitrogen)
  - Taurine
- Brands that have used this in the past
  - Body Fortress, ProSupps, MusclePharm Arnold series, 4 Dimension Nutrition, Designer Whey, Mutant Nutrition, Gaspari Nutrition, Giant Sports Nutrition, Infinite Labs, and Beast Sports Nutrition



# NCAA BANNED VS. IMPERMISSIBLE

## Banned

- NCAA **banned substances** include all of the following:
  - Stimulants
  - Anabolic Agents
  - Alcohol and Beta Blockers (banned for rifle only)
  - Diuretics and Other Masking Agents
  - Street Drugs
  - Peptide Hormones and Analogues
  - Anti-estrogens
  - Beta-2 Agonists
  - **Anything chemically related to the above is also banned**

## Impermissible

- NCAA banned substances include all of the following:
  - Creatine
  - Nitric Oxide supplements
  - Omega-3's
  - Glucosamine/chondroitin
  - Food products (other than those included in the fruit, nuts and bagels bylaw)
  - Any protein supplement that contains more than 30% of total calories from protein.
  - Any supplement that contains "herbal" or "all natural" ingredients that cannot be positively identified on a nutrition facts label.
  - Individual amino acids (branched chain amino acids, glutamine, carnitine, etc)

# NCAA SUPPLEMENT REGULATIONS

- It is not permissible for an institution to provide any nutritional supplement to its student athletes, unless the supplement is a non-muscle-building supplement and is included in one of the four classes of permissible products:
  - Carbohydrates/electrolyte drinks
  - Energy bars
  - Carbohydrate boosters
  - Vitamins and minerals
- A supplement that contains protein may be classified as a non-muscle-building supplement if it conforms to the following criteria:
  - It is included in one of the four permissible categories
  - It does not contain more than 30% of calories from protein (based on product label)
  - It does not contain additional ingredients that are designed to assist in the muscle-building process

# NCAA NUTRITIONAL/DIETARY SUPPLEMENTS WARNING

- Dietary supplements are not well regulated and may cause a positive drug test result.
- Student-athletes have tested positive and lost their eligibility using dietary supplements.
- Many dietary supplements are contaminated with banned drugs not listed on the label.
- Any product containing a dietary supplement ingredient is taken at your own risk!

# BANNED SUBSTANCES TESTING



In 2010, **35** World Anti-Doping Agency (WADA) accredited laboratories detected **4,818 findings of confirmed and suspected prohibited substances.**<sup>3</sup>

**88**

resulted in international federation anti-doping rule violations <sup>4</sup>

**1,265**

resulted in national anti-doping rule violations <sup>5</sup>

# BUYER BEWARE: NOT ALL SUPPLEMENTS ARE SAFE

In the past four years...

**1 in 2**

inspections by FDA have seen significant manufacturing practice violations.<sup>15</sup>

**1 in 4**

inspections have resulted in a warning letter.<sup>16</sup>

This is the **highest rate** of any FDA regulated industry for non-compliance.<sup>17</sup>



# What's in your supplement?

How often are products contaminated by banned substances?

In 2004, a study funded by the International Olympic Committee found that 15% of 634 supplements tested from 13 countries contained steroids prohibited in sport, none of which were declared on the label.<sup>18</sup>

In 2012, 84 illegal products, such as energy and muscle gain products, were found to contain dangerous ingredients, including steroids, stimulants and hormones.<sup>19</sup>



*In both studies, tested products were obtained from online and retail stores.*

<http://www.nsf.org/>

# DOPING OFFENSES – NCAA POLICY

- **1<sup>st</sup> Offense for performance-enhancing or street drugs**
  - Lose 1 year of eligibility
  - Withheld from competition for a full season
- **2<sup>nd</sup> Offense for street drugs**
  - Lose another year of eligibility
  - Withheld from competition for a full year
- **2<sup>nd</sup> Offense for performance-enhancing drugs**
  - Renders the student-athlete permanently ineligible



# WHAT IS A SUPPLEMENT?

- Vitamins
- Minerals
- Herbs
- Botanicals
- Amino acids
- Any concentrate, metabolite, constituent, or combination of the above ingredients

**Ergogenic Aids** - any external influences that enhance athletic performance or facilitate physical exercise.



# 5 CONSIDERATIONS IN EVALUATING SUPPLEMENTS

**1. Safety**

**2. Effectiveness**

**3. Doping Status**

**4. Dose**

**5. Quality**

# SAFETY

- Safety is paramount, because as the Hippocratic Oath states: “First, do no harm.”



# EFFECTIVENESS

- Is the claim being made reasonable from a physiological perspective.
- I.E. - Is the supplement's purported mechanism of action is **biologically plausible**

PLAUSIBLE

# DOPING STATUS

- Will this legal sports supplement cause the athlete **to test positive for a prohibited substance**
- Some may contain ingredients not declared on the label that are prohibited by doping regulations



**WORLD  
ANTI-DOPING  
AGENCY**  
play true



INTERNATIONAL  
OLYMPIC  
COMMITTEE

# DEER ANTLER VELVET

- Crushed antler base of the mammal's antlers
- Claim – Will increase certain hormone levels to promote muscle growth and performance enhancement
- The Rub – It's not effective

The screenshot shows a mobile application interface with a blue header containing a back arrow, a shield icon, the text 'Product Status', and a menu icon. Below the header, a red diagonal banner with the word 'BANNED' in white is positioned over a small image of a blue bottle labeled 'DEER ANTLER VELVET'. To the right of the bottle, the product name 'New Zealand Red Deer Antler Velvet Natural Sport' is displayed in blue text. Below the product name, the text 'Updated 03/16/2015' and 'Reference Code: 1186580-1454528727' is shown. A grey box contains a red gear icon with a white 'no' symbol, followed by the text 'Label Review BANNED'. Below this, a paragraph explains that the product's ingredients violate Collegiate's prohibited substances policy. The bottom navigation bar features four icons: a checkmark, a list, an information symbol, and a group of people, with labels 'Status', 'Details', 'Disclaimer', and 'Program' respectively.

< Product Status

**BANNED**

**DEER ANTLER VELVET**  
NATURAL SPORT

**New Zealand Red Deer Antler Velvet Natural Sport**

Updated 03/16/2015  
Reference Code:  
1186580-1454528727

Label Review  
**BANNED**

After evaluation of the ingredients listed on this product's label, the following substances are in violation of Collegiate's prohibited substances policy:

Status Details Disclaimer Program



# DOSE

- Does the product contain enough of the ingredient to elicit a physiological response?



Ingredient	Six Star Explosion Dose	Effective Dose
Vitamin C	250 mg	2,000 mg
Beta-Alanine	1,500 mg	2,000-5,000 mg
Creatine	1,500 mg	2,500-5,000 mg
L-Arginine	1,100 mg	3,000-6,000 mg
Caffeine	135 mg	100-200 mg

# QUALITY

- The following four factors should be examined when assessing quality:
  - **Identity** - Does the product's contents match what is printed on the label?
  - **Potency** - Does the product contain the amount of the ingredient claimed on the label?
  - **Purity** - Is the product free of unacceptable levels of contaminants?
  - **Bioavailability** - Does the ingredient break apart properly in the body so that it may be assimilated?

# Caffeine Drug Interactions

[Overview](#)

[Side Effects](#)

[Dosage](#)

**Interactions**

[Professional](#)

[More](#) 

**Drug Interactions** (85)

[Alcohol/Food Interactions](#) (3)

[Disease Interactions](#) (3)

A total of **85 drugs** (430 brand and generic names) are known to interact with **caffeine**.

-  **11 major** drug interactions (85 brand and generic names)
-  **30 moderate** drug interactions (151 brand and generic names)
-  **44 minor** drug interactions (194 brand and generic names)

# RED FLAG TAG LINES

- Watch out for companies that market products in the following categories:
  - **Muscle Building**
    - Anabolic agents
    - Hormones
    - Aromatase inhibitors (prevents testosterone breakdown)
  - **Weight Loss**
    - Diuretics or drugs such as sibutramine
  - **Energy Supplements**
    - May contain stimulants
- Watch out for ingredients ending in –ol, –diol, or –stene, or ingredients that contain a lot of numbers. These may be steroids.



# THIRD PARTY TESTING

- **Beware of products that have not been tested by a qualified third-party.**
- Some companies claim their products are approved by:
  - WADA (World Anti-doping Agency)
  - USADA (US Anti-doping Agency)
  - NCAA
- **These are false claims as these agencies do not approve any dietary supplement products!**

# THIRD PARTY TESTING

**No testing can guarantee that a supplement is 100% free of banned substances**

**We don't "recommend" anything, we only guide**

# WHY ARE CERTIFIED SUPPLEMENTS SAFER?\*



## Banned Substances Screening:

to certify supplements are free of more than 170 prohibited substances on the World Anti-Doping Agency's list, as well as NFL, MLB and NCAA prohibited substances lists.



## Label Claim Review:

to certify what's on the label is in the product and nothing else.



## Toxicology Review:

to verify product formulation and safety levels of ingredients.



## Contaminant Review:

to ensure there are no undeclared ingredients or unsafe levels of harmful contaminants in the product.



## Facility Audits:

annual Good Manufacturing Practice (GMP) audits to ensure ongoing compliance with FDA regulations, along with an on-site inspection to ensure banned substances are not present.



## Ongoing Monitoring:

to certify compliance via annual facility auditing and product testing.

*\* Certification criteria based on NSF International's Certified for Sport® program.*

<http://www.nsf.org/>





# APPS



**Aegis Shield  
Mobile**



**NSF for Sport**



**WADA  
Prohibited List  
2016**

# INTERNET RESOURCES FOR EVALUATING SUPPLEMENTS

- **Examine ([www.examine.com](http://www.examine.com))** – Free information, referenced
- **USDA National Agricultural Library: Dietary Supplements (<http://fnic.nal.usda.gov/dietary-supplements>)**
- **NIH Annual Bibliographies Of Significant Advances In Dietary Supplement Research ([http://ods.od.nih.gov/Research/Annual\\_Bibliographies.aspx](http://ods.od.nih.gov/Research/Annual_Bibliographies.aspx))**
- **NIH Dietary Supplement Label Database (<http://www.dsld.nlm.nih.gov/dsld/>)**
- **National Library of Medicine Database ([www.ncbi.nlm.nih.gov/PubMed](http://www.ncbi.nlm.nih.gov/PubMed))**

Are there any ergogenic supplements that I need?

No, you don't need any by definition but there are some that are helpful

# BETTER TO BE PROACTIVE THAN REACTIVE

- Don't hesitate to ask us about any supplement
- If you are currently or plan to introduce a supplement, contact [dbusteed@gmu.edu](mailto:dbusteed@gmu.edu)
- Schedule a supplement consult
- Include the brand and name of the supplement
- Include what their goal in taking this supplement is
- Information about the supplement and label always help