CAFFEINE BEHIND THE BUZZ

Presented By: Ryan Messinger, M.S., CHES
Assistant Director – EIU Health Service
~~IHEC Webinar 2011 March~~
PRESENTATION OBJECTIVES

- **Objective 1**: Provide a history and overview of caffeine
- **Objective 2**: Effects on users with emphasis on college aged population
- **Objective 3**: Regulations and education practices to address caffeine usage
CAFFEINE

BEHIND THE

BUZZ

Caffeine’s Beginnings...
**Brief History of Caffeine**

- Use of caffeine dates back 1000’s of years
  - Evidence of caffeine during Stone Age
  - Consumption of leaves or berries containing caffeine
- Caffeinated tea consumed in China dating back to 2737BC
  - Emperor Shen Nung
  - Tasted hundreds of herbs
- Olmecs cultivated cacao tree by 1000BC
  - Mayaan elite consumed Xocoatl
  - Cocoa beans were used as currency until 1521
- Coffee Beans in Ethiopia
  - Story of a Shepherd and his animals 900AD
Brief History of Caffeine

- Coffee in the U.S.
  - Boston Tea Party 1767
  - Coffee has been more popular in U.S. since then

- Coca-Cola and Caffeine
  - 1916 – U.S. Government seized 40 barrels and 20 kegs of Coca-Cola syrup
  - Pure Food and Drug Act
  - Seized for “adulterating product” by adding artificial caffeine

- Coffee, Tea, and Cola
  - 3 most popular drinks in the world
  - Common denominator - Caffeine
THE U.S. CAFFEINATED CRAZE - MILESTONES

- 1980 – FDA proposes eliminating caffeine from soft drinks
  - Citing health concerns
  - Manufacturers – cite caffeine as “flavor enhancer”
  - FDA Approved regulated cola-type soft drinks
    - 0.02% caffeine or 71mg per 12 fl oz
THE U.S. CAFFEINATED CRAZE - MILESTONES

1985 – JOLT Cola
- “Twice the Caffeine”
- Espresso of Colas
- 280mg of caffeine
- First soda marketed for “energy” through caffeine
The U.S. Caffeinated Craze - Milestones

- 1994 – FDA Dietary Supplement Health & Education Act
  - Different regulations than conventional foods/drugs
  - Product safety responsibility of manufacturer
  - FDA investigates after reaching market
THE U.S. CAFFEINATED CRAZE - MILESTONES

- 1997 – Red Bull Hits the States
  - First produced in 1987 – Austria
  - Advertising key
  - Marketed as an energy booster for mind and body
  - Market leader with sales in the billions

Red Bull
THE U.S. CAFFEINATED CRAZE - MILESTONES

- Present Day
  - Over 500 new brands launched in 2006
  - Over 1,000 brands worldwide in 2010
  - U.S. retail market exceeds $5 billion annually
  - Caffeine ranges 50mg – 505mg per can/bottle
  - Other ingredients
    - Taurine, guarana, riboflavin, nicotinamide, B vitamins, other herbal supplements... & lots of sugar usually!
THE U.S. CAFFEINATED CRAZE - MILESTONES

○ Caffeinated Alcoholic Beverages (CABS)
  • Prior to 4 Loko - Several producers
  • Criticized for targeting youth
  • Potential dangers
    ○ Masking key feelings of inebriation
    ○ Stimulant with a depressant – Health concerns
  • November 12, 2010 – FDA notified 30 manufacturers
    ○ Required to show caffeine as an additive as safe
    ○ 30 days to show results/compliance
  • December 13, 2010
    ○ Manufacturers agreed to stop selling products in current form
**CAFFEINE IN ITS MANY FORMS**

- **Wearable Caffeine – Transdermal delivery method**
  - The Caffeine Patch – Spot on Energy
  - 74mg of caffeine per patch
  - 4-5 hours of energy

Image and info courtesy of www.spotonenergy.com
CAFFEINE IN ITS MANY FORMS

- “Snort-able” Caffeine
  - Caffeine powder designed to be snorted through nose or mixed with drinks
  - Blowout – Party Snuff available online for $16
  - Popular in Europe
  - Marketed as “legal” cocaine
CAFFEINE IN ITS MANY FORMS

- Caffeine Pills
  - On average 100mg – 200mg per dosage
  - Weigh-loss agent
  - Popular brands include: No-Doze, Redline, Umph, Jet-Air, and generics

- Caffeine Candy and Food
  - Naturally occurring in many foods
  - New breed of caffeine-spiked candies and foods
    - Invigorated with 100+mg of caffeine per serving
CAFFEINE IN ITS MANY FORMS

- Caffeine Soap
  - Designed to be used in the shower for transdermal uptake of caffeine
  - Each “serving” delivers approximately 100mg of caffeine
  - Also available as a body wash!
CAFFEINE IN ITS MANY FORMS

- Intravenous Caffeine (medical)
  - Caffeine and Sodium Benzoate
  - Used to treat respiratory depression in a clinical setting
  - Excites muscles, increases blood pressure, increases heart rate

- Animal grade Caffeine and Sodium Benzoate
  - Order online for $15 a vial
  - Reports of athletes using for performance purposes
CAFFEINE IN ITS MANY FORMS

- Why not get a kilo?

Image retrieved from: www.ebay.com
NEW AND INTERESTING PRODUCT

Info taken from my IHEC presentation in 2010...

- **Inhalable Caffeine**
  - “It’s time to make smoking cool again!”
  - Though this is **not** a real product yet, the possibility does exist!

- **Fast Forward …**

- **The “Le Whif” caffeine inhaler**
  - Became available in October 2010
  - 100 mg of caffeine
  - Various flavors
CAFFEINE

BEHIND THE BUZZ

Caffeine’s Best Friends...
The College Population & Effects
Energy Drinks and College

- Marketed to students, athletes, & active individuals
  - Between the ages of 21-35 is primary target
  - Males dominate market – comprising 65%
  - Nightlife

- What’s the appeal?
  - Remedy for insufficient sleep
  - Increase energy/memory alertness
  - To party
  - Treat a hangover
## 2007 Nutritional Journal Study

<table>
<thead>
<tr>
<th>Situation</th>
<th>Females (%)</th>
<th>Males (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient Sleep</td>
<td>67%</td>
<td>68%</td>
</tr>
<tr>
<td>Need Energy</td>
<td>62%</td>
<td>69%</td>
</tr>
<tr>
<td>Studying / Major Project</td>
<td>46%</td>
<td>56%</td>
</tr>
<tr>
<td>Driving Vehicle for Long Period of Time</td>
<td>40%</td>
<td>51%</td>
</tr>
<tr>
<td>Mix w/Alcohol While Partying</td>
<td>57%</td>
<td>50%</td>
</tr>
<tr>
<td>Treat Hangover</td>
<td>16%</td>
<td>18%</td>
</tr>
</tbody>
</table>

Respondents 18-24 years of age: 146 females, 107 males
Energy Drinks and College

College – Caffeine – Alcohol... a dangerous combination

- Association between heavy use of caffeine and heavy use of alcohol
- In a 2008 survey, 1253 college students
  - Energy drinks disproportionately used by males
  - Energy drink users consumed alcohol more frequently than non-users
ENERGY DRINKS AND COLLEGE

- Marketing
  - Alluring names, can designs, product claims
  - Variety
  - Sponsorship
    - Concerts
    - Sporting Events
    - Endorsements
  - Direct college marketing
    - Student Reps
    - Free samples on campus
    - Ad space in college newspapers
    - College bar/club promotions
POTENTIAL DANGERS / NEGATIVE CONSEQUENCES OF CAFFEINE

Main side effects of Caffeine

Eyes:
- Blurred vision

Central:
- Drowsiness
- Decreased or increased hunger
- Thirst
- Anxiety
- Confusion
- Irritability
- Insomnia

Sense of balance:
- Dizziness

Systemic:
- Hyperglycemia

Mouth:
- Dryness

Muscular:
- Tremor

Skin:
- Flushing
- Cold sweats
- Pallor

Gastric:
- Nausea
- Ache

Heart:
- Fast heartbeat

Respiratory:
- Fruit-like breath odor
- Troubled breathing

Urinary:
- Increased urination
- Ketones in urine

Intestinal:
- Diarrhea
**Potential Dangers / Negative Consequences of Caffeine**

- Alcohol and Caffeine
  - Act as antagonists, masking the feeling of intoxication
  - May mask negative side-effects of alcohol (ex: headaches, dizziness, etc.)
    - Unable to mask psychomotor impairments
    - Tendency to consume more alcohol when combined with caffeine
  - Can lead to “toxic jock syndrome” = more risk taking
POTENTIAL DANGERS / NEGATIVE CONSEQUENCES OF CAFFEINE

- Caffeine Intoxication
  - > 900mg – Cause death in humans
  - 400mg can cause tremors, dizziness, heart palpitations, seizures
  - Sensitivity is different for everyone!!
ANTIDEPRESSANT MEDICATIONS & CAFFEINE

- Side effects of many antidepressants
  - Tremors
  - Anxiety
  - Paranoia
  - Dry Mouth
  - Restlessness
  - Fatigue
  - Nausea
- Caffeine may exacerbate these...
- Concerns about medication/treatment effectiveness
CAFFEINE & THE LATER YEARS...
Regulation and Education
**Caffeine Regulation**

- **FDA Dual Regulation of Caffeine**
  - Food or drug criteria
    - Product is intended to be used for diagnosis or treatment of disease
    - Whether it is intended to affect the body’s structure or its function
    - Specific intent of the vendor
      - Intent may be derived or inferred
CAFFEINE REGULATION

- FDA I – Regulated as a Food
  - Regulation as a food less severe
  - Caffeine in food falls under GRAS statute
    - Caffeine added to cola a GRAS since 1961
    - Must adhere to good manufacturing practice
CAFFEINE REGULATION

- **FDA I – Regulated as a Food**
  - **What are the labeling requirements**
    - Must be listed in ingredients list when used as an additive
    - Does not apply to naturally occurring caffeine products
  - **FDA does not require disclosure of caffeine quantity in food products**
    - Example – Soda states “caffeine” in ingredient list, but not amount
CAFFEINE REGULATION

- FDA II – Regulated as a Drug
  - FDA approval for sale
    - Submit for drug approval
    - Manufacturer must comply with FDA regulations
    - Manufacturer must show that product is safe
    - Receive a category I monograph from FDA
      - Must receive category I approval before marketing to public
CAFFEINE REGULATION

- FDA II – Regulated as a Drug
  - FDA relies on technical information & expertise of advisory panels and committees
    - Ultimate decision for approval rests with agency
Caffeine Regulation

- FDA II – Regulated as a Drug
  - FDA approved products
    - “Restore mental alertness or wakefulness during fatigue or drowsiness”
  - Menstrual Products
    - Diuretic stimulant
  - Analgesic adjuvant in aspirin and other headache relievers

![Drug Facts Table]

Drug Facts

<table>
<thead>
<tr>
<th>Active ingredient</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amica Extract 20%</td>
<td>Analgesic</td>
</tr>
</tbody>
</table>

Uses: reduces and relieves the following symptoms:
- Bruises
- Sprains
- Wounds
- Anti-inflammatory
- Analgesic

Warnings:
- Ask a doctor before use if you have:
- Severe bleeding
- If pregnant or breast-feeding, ask a health professional before use.
- Keep out of reach of children. In case of overdose, get medical help or contact a Poison Control Center right away.

Directions:
- Apply to affected area 3-4 times daily, rubbing gently until fully absorbed.

Other Information:
- Store at 20-25°C (68-77°F)
CAFFEINE REGULATION

- 1994 – FDA Dietary Supplement Health & Education Act
  - Signed into law by President Clinton
  - Congress defined dietary supplement as:
    - Product taken by mouth
    - Contains a “dietary ingredient” intended to supplement the diet
    - Ingredients may include: vitamins, mineral, herbs, other botanicals, amino acids, and substances such as enzymes, organ tissues, glandulars, and metabolites.
    - Under the umbrella of foods… not drugs
    - Must be labeled “Dietary Supplement”
Caffeine Regulation

1994 – FDA Dietary Supplement Health & Education Act

- Manufacturers do NOT need to receive FDA approval before marketing
- Only requirement prior to manufacturing/marketing...
  - Register themselves pursuant to the Bioterrorism Act with FDA
- 2007 FDA published comprehensive regulations for those that manufacture, package, or hold dietary supplement products
CAFFEINE REGULATION

- 1994 – FDA Dietary Supplement Health & Education Act
  - Information that must be included on labeling
    - Descriptive name of product with label indicating “dietary supplement”
    - Name and place of manufacturer, packer, or distributor
    - Complete list of ingredients
    - Net contents of product
    - Nutrition label (Supplement Facts) indicating each dietary ingredient
SO WHAT CAN BE DONE?

○ Environmental
  ○ Start with an environmental scan
    ○ Advertisements?
    ○ Users?
    ○ Stores, restaurants, bars advertising energy drink specials?
    ○ Athletics?
    ○ Timing?
  ○ Target student segments or locations
    ○ Counter advertising/education
    ○ Approach establishment owners or supporting departments
      ○ Provide education
      ○ Request less emphasis on marketing
**So What Can be Done?**

- Some schools have banned the sale of energy drinks on-campus.
- Some schools prohibit energy drink vendors from freely dispersing products.
  - EIU requires them to submit a request for space and approval, just like any other vendor.
- Schools whose unions/meeting rooms serve as banquet facilities.
  - Not offer energy drinks as a bar mixer.
    - Cite liability, harder for servers to determine intoxication level due to protagonist effects.
So What Can be Done?

- **Education**
  - Gather data from alcohol infractions
  - Promote responsible use through “risk reduction” techniques
    - Limit the number of drinks
    - Alternate drinks with water and non-alcoholic drinks
    - Limit caffeine consumption while consuming alcohol
  - Offer options
    - Healthy foods/drinks as caffeine replacement
    - Cut back on consumption
SO WHAT CAN BE DONE?

- What is your opinion?

- What are some ways that you are addressing this issue at your institution? Is this an issue?

- What can you be doing at your institution?
THANK YOU!

Contact Info:
Ryan Messinger, M.S., CHES
Assistant Director for Health Education & Promotion
Eastern Illinois University – Health Service
Charleston, IL 61920
217-581-7815
rcmessinger@eiu.edu
REFERENCES

17. http://www.speedace.info/red_bull.htm
IMAGE CITATIONS

- www.thinkgeek.com
- www.spotonenergy.com
- www.ebay.com
- www.alibongo.co.uk/
- www.riscx.com
- www.joltenergy.com
- www.speedace.info/red_bull.htm
- www.collegecandy.files.wordpress.com/2008/02/09/blow-energy.jpg
- http://www.basisonline.org/images/2008/01/17/stash_vol_41_figure_1_4_4.jpg
- http://www.exercisehealthynutrition.com/sitebuilder/images/Pepsi_label-291x372.jpg
- http://www.listedonline.co.nz/images/stories/articles/approved.png
- http://pictures.directnews.co.uk/liveimages/Scientist_2191_19513729_0_0_6001294_300.jpg