Caffeine in Energy Drinks & Dietary Supplements in the US

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Office of Dietary Supplements
Disclaimer: The views and ideas presented here are my own and do not represent those of the NIH or any other federal entity.

I have no conflicts of interest to disclose; but, I love coffee!
What is the prevalence of use of energy products in the U.S.?

Available Data Sources (others exist)

1.) Sales Data

2.) National Monitoring Data
   - Health and Nutrition Examination Survey (NHANES)

3.) Emergency Room Visits
Background

- Energy and caffeine are not synonymous
- Confusion about energy drinks vs energy supplements
- Products are consumed differently
  - Dietary Supplements – 1 capsule
    - *Stacker 2 Yellow Hornet* – 300mg caffeine
Energy and caffeine are not synonymous

Confusion about energy drinks vs energy supplements

Products are consumed differently

- Dietary Supplements – 1 capsule
  - *Stacker 2 Yellow Hornet* – 300mg caffeine
1.) Sales and Growth Data

Figure 10-18 U.S. Sports/Energy/Weight-Loss Condition Specific Supplement Sales & Growth, 2000-2015e

Sales and Growth over the years from 2000 to 2015, showing a fluctuating pattern with peaks and troughs.

Source: Nutrition Business Journal estimates. ($mil., consumer sales)
Sales Data = Strengths and Limitations

- Doesn't represent consumption
- Doesn’t control for product pricing (expensive products with little use, or cheap products with high use)
- Does allow to compare trends over time
- Does provide a signal of product type relative to other product types
  - 1, Multi-vitamins = ~5 billion
  - 2, Sports Nutrition = ~ 3 billion
2.) Emergency Room Visits

Update on Emergency Department Visits Involving Energy Drinks: A Continuing Public Health Concern
Number of Emergency Room Visits Associated with energy Drinks by Time

- 2005: 1,494
- 2006: 3,210
- 2007: 10,068
- 2008*: 16,059
- 2009: 13,119
- 2010*: 15,219
- 2011*: 20,783
Number of Emergency Room Visits by Age, Time

<table>
<thead>
<tr>
<th>Age Group</th>
<th>2007</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aged 12 to 17</td>
<td>1,145</td>
<td>1,499</td>
</tr>
<tr>
<td>Aged 18 to 25</td>
<td>4,200</td>
<td></td>
</tr>
<tr>
<td>Aged 26 to 39</td>
<td>3,340</td>
<td></td>
</tr>
<tr>
<td>Aged 40 or Older</td>
<td>1,382</td>
<td>5,233</td>
</tr>
</tbody>
</table>
3.) National Health and Nutrition Examination Survey (NHANES)

To assess the health and nutritional status of adults and children in the United States.
NHANES Measurement

- Dietary Supplements
  - Home Interview
    - Frequency of use in the previous 30 days
    - Show containers to the NCHS staff

- Diet and Dietary Supplements
  - Mobile Exam Center (in person) and by telephone
    - 2, 24-hour dietary recall
    - Reminded of reported usage in the home
Very little usage of dietary supplements with caffeine in the US

Energy drink usage is more common, with highest usage in males 14-50 years

Energy “products” add ~150/200 mg/day of caffeine*

*From products with a label declaration of amount
Estimating Caffeine Exposure is Difficult

- Reporting the amount of caffeine is not consistent for both foods and supplements.

- The amount of caffeine as part of a “blend” does not need to be declared for foods or dietary supplements.

- Very little is known about the accuracy of reporting of energy products or the usual consumption patterns.
  - Makes it difficult to estimate who is using, how often, and how much.
**Supplement Facts**

**Serving Size 1/4 teaspoon**

**Servings per Container 45**

**Ingredient - Amount per Serving - % Daily Value**

- **Caffeine - 450 mg**

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**SUPPLEMENT FACTS**

**SERVING SIZE 2 FL. OZ.**

<table>
<thead>
<tr>
<th>AMOUNT PER SERVING</th>
<th>% DAILY VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALORIES 0</td>
<td>CALORIES FROM FAT 0</td>
</tr>
<tr>
<td>TOTAL CARBOHYDRATES 0g</td>
<td>0%</td>
</tr>
<tr>
<td>NIACIN (AS NIACINAMIDE) 20mg</td>
<td>100%</td>
</tr>
<tr>
<td>VITAMIN B6 (AS PYRIDOXINE HYDROCHLORIDE) 40mg</td>
<td>2000%</td>
</tr>
<tr>
<td>FOLIC ACID 400mcg</td>
<td>100%</td>
</tr>
<tr>
<td>VITAMIN B12 (AS CYANOCOBALAMIN) 500mcg</td>
<td>83333%</td>
</tr>
<tr>
<td>SODIUM 10mg</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

**ENERGY BLEND 2125mg**

- TAURINE, MALIC ACID, CAFFEINE, GLUCURONOLACTONE, N-ACETYL L-TYROSINE, L-PHENYLALANINE

**ENZYME BLEND Tmg**

- AMYLASE, PROTEASE, LIPASE, CELLULASE, LACTASE

* DAILY VALUE NOT ESTABLISHED

**OTHER INGREDIENTS: FILTERED WATER, NATURAL FLAVORS, POTASSIUM SORBATE & SODIUM BENZOATE (TO PROTECT FRESHNESS), SUCRALOSE.**

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**Ingredients:**

Sparkling water, organic evaporated cane juice, organic guarana seed extract (contains 125mg of naturally occurring caffeine per serving), malic acid, natural flavors, citric acid, organic ginkgo biloba leaf extract, organic echinacea flower extract, organic panax ginseng root extract.
Existing database to capture labels of dietary supplements of more than 20,000 products
## Distinct products with “Energy” in the product name (N=157)

<table>
<thead>
<tr>
<th>Form</th>
<th>Contain caffeine</th>
<th>Provide caffeine content on the label</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Liquid (Serving size =&gt;1 fl oz) 20%, n=32</td>
<td>29</td>
<td>3</td>
</tr>
<tr>
<td>All other 80%, n=125</td>
<td>52</td>
<td>73</td>
</tr>
</tbody>
</table>

Conclusions

- Sales of sports and energy supplements increasing over time
- Emergency room visits increased from 2007 to 2011
- Use of “energy” products from NHANES remains low overall
- Many energy products on the market, data from the DLSD
Data Gaps

- Need a clear definition of what is an energy product
  - Need for consistency – more than 300 synonyms for the word caffeine

- Understanding of the role of other ingredients in these products with caffeine (and alone)

- Understanding of the best way to assess intakes of these products
Data Gaps

- Understand what are the high risk groups and what are the high user groups
  - National monitoring surveys are not likely to pick up the high-usage groups
  - Time lag, most recent is 2010

- To get more precise estimates of caffeine exposure it will be necessary to have databases that are complete and current
Thank you!

- Jaime Gahche – NCHS/CDC
- Johanna Dwyer – ODS/Tufts
- Barbara Sorkin, Joseph Betz & Leila Saldanha-ODS
- Pamela Pehrsson & David Hatowitz-USDA
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Product-type breakdown of Sales

- Meal Replacement Supplements: 32%
- Sports Nutrition Supplements: 43%
- Other Herb Formulas: 11%
- Green Tea: 1%
- Bee Products: 1%
- Multivitamins: 4%
- Others: 8%