MARKETING THE HEALTH BENEFITS OF SMALL FRUIT

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Overview

• Health benefits of small fruits
• FDA rules about health claims
  • Disease claims
  • Nutrient content claims
  • Structure/function claims
• Nutrient profiles of small fruits
• Filing petitions for new claims
Health Benefits of Small Fruits

• Components associated with health benefits:
  • Vitamin C (Ascorbic Acid)
  • Flavanonids
  • Phenolic acids
  • Tannins
Health Benefits of Small Fruits

- Cardiovascular disease
- Cancer
- Diabetes
- Obesity
- Reduced inflammation and oxidative stress
Cardiovascular Disease

- Reduced total cholesterol and LDL
- Reduced lipid oxidation
- Improved plasma antioxidant capacity
- Improved glucose metabolism

- Mechanisms:
  - Upregulation of nitric oxide synthase
  - Decreased carbohydrate digestive enzymes
  - Reduction in oxidative stress
  - Inhibition of pro-inflammatory gene expression
Cancer

- Reduction in oxidative stress
- Reduction in inflammation
- Upregulation of detoxification enzymes
- Inhibition of cell proliferation
- Cancer cell apoptosis
- Inhibition of metastasis

- Colon cancer human clinical trials
- Esophageal cancer in animal models
- Oral cancer animal models and phase zero human trial
- Breast cancer *in vitro* evidence
Diabetes

- Increased insulin secretion
- Reduced oxidative stress
- Inhibition of carbohydrate and lipid digestive enzymes
- Improved insulin sensitivity
Obesity

- Obesity pathology is characterized by enlargement of fat cells and production of inflammatory adipokines and adhesion molecules.

- Animal and human trials have shown:
  - Decrease in body fat
  - Decrease in waist circumference
  - Antihyperglycemia
  - Antihyperlipidemia
  - Improved antioxidant status

- Mechanisms:
  - Reduced lipid absorption
  - Decreased proliferation of preadiposites
  - Increased lipolysis
  - Inhibition of secretion of inflammatory adipokines
FDA Oversight of Health Claims

- The FDA regulates food labeling
- The complete food labeling rule is complied in Title 21 of the Code of Federal Regulations (CFR) subpart 101
- [http://www.ecfr.gov](http://www.ecfr.gov)
- FDA website has a Q&A format guide for Labeling and Nutrition
- The FDA has the power to enforce the rule and penalize violations

(Fruit Growers News)

**FDA: Companies Must Stop Promoting Health Benefits of Cherries on Labels**

On Oct. 17, the U.S. Food and Drug Administration (FDA) sent warning letters to 29 companies that manufacture, market or distribute products made from cherries and some other fruits. The letters instructed the companies to stop making unproven health claims on their Web sites and product labels.

The warnings came as a surprise to some of their recipients.

“We didn’t understand that we were breaking any laws,” said Loren Queen, product manager for TPG Enterprises. “That wasn’t our intention.”

If the companies cited fail to take prompt corrective measures, they might face FDA enforcement action — including seizure, injunctions or criminal sanctions — without further notice, according to the FDA.

Types of Health Claims

• General Health Statements
• Disease Claims
• Nutrient Content Claims
• Structure/Function Claims
General Health Statements

• You may make general statements about health promotion and disease prevention as long as the statement doesn't imply that your product can diagnose, cure, mitigate, treat, or prevent a disease.

• An example of an acceptable claim is "a good diet promotes good health and prevents the onset of disease" or "better dietary and exercise patterns can contribute to disease prevention and better health."
Disease Claims

• This type of claim makes a connection between specific foods and specific diseases

• Only claims that have been approved by the FDA can be used

• There currently are three relevant claims that can be used on fruits and vegetables

• Require nutrition information labeling
### 21 CFR 101.76

<table>
<thead>
<tr>
<th>Approved Claims</th>
<th>Requirements for the Food</th>
<th>Claim Requirements</th>
<th>Model Claim Statements</th>
</tr>
</thead>
</table>
| Fiber-Containing Grain Products, Fruits, and Vegetables and Cancer | A grain product, fruit, or vegetable that contains dietary fiber; Low fat, and Good source of dietary fiber (without fortification) | "Fiber", "Dietary fiber", or "Total dietary fiber"  
"Some types of cancer" or "Some cancers"  
Does not specify types of dietary fiber that may be related to risk of cancer. | Low fat diets rich in fiber-containing grain products, fruits, and vegetables may reduce the risk of some types of cancer, a disease associated with many factors. |
### 21 CFR 101.77

**Fruits, Vegetables and Grain Products that contain Fiber, particularly Soluble Fiber, and Risk of Coronary Heart Disease**

<table>
<thead>
<tr>
<th>Approved Claims</th>
<th>Requirements for the Food</th>
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<th>Model Claim Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A fruit, vegetable, or grain product that contains fiber; Low saturated fat, Low cholesterol, Low fat,</strong>&lt;br&gt;<strong>At least 0.6 grams of soluble fiber per RACC (without fortification), and,</strong>&lt;br&gt;<strong>Soluble fiber content provided on label</strong></td>
<td>&quot;Fiber&quot;, &quot;Dietary fiber&quot;, &quot;Some types of dietary fiber&quot;, &quot;Some dietary fibers&quot;, or &quot;Some fibers&quot;&lt;br&gt;&quot;Saturated fat&quot; and &quot;Cholesterol&quot;&lt;br&gt;&quot;Heart disease&quot; or &quot;Coronary heart disease&quot;</td>
<td>Diets low in saturated fat and cholesterol and rich in fruits, vegetables, and grain products that contain some types of dietary fiber, particularly soluble fiber, may reduce the risk of heart disease, a disease associated with many factors.</td>
<td></td>
</tr>
</tbody>
</table>
### 21 CFR 101.78

<table>
<thead>
<tr>
<th>Approved Claims</th>
<th>Requirements for the Food</th>
<th>Claim Requirements</th>
<th>Model Claim Statements</th>
</tr>
</thead>
</table>
| **Fruits and Vegetables and Cancer** | A fruit or vegetable, Low fat, and Good source (without fortification) of at least one of the following  
• Vitamin A  
• Vitamin C  
• Dietary fiber | "Fiber", "Dietary fiber", or "Total dietary fiber";  
"Total fat" or "Fat",  
"Some types of cancer" or "Some cancers"  
Characterizes fruits and vegetables as "Foods that are low in fat and may contain Vitamin A, Vitamin C, and dietary fiber."  
Characterizes specific food as a "Good source" of one or more of the following: Dietary fiber, Vitamin A, or Vitamin C.  
Does not specify types of fats or fatty acids or types of dietary fiber that may be related to risk of cancer. | Low fat diets rich in fruits and vegetables (foods that are low in fat and may contain dietary fiber, Vitamin A, or Vitamin C) may reduce the risk of some types of cancer, a disease associated with many factors. Broccoli is high in vitamin A and C, and it is a good source of dietary fiber. |
Nutrient Content Claims

• “Good Source”
  • 10 – 19% Recommended Daily Intake (RDI) or Daily Recommended Value (DRV) expressed as %DV on the label

• “High in”
  • At least 20% of the RDI or DRV expressed as %DV on the label

  e.g. “Strawberries are high in Vitamin C”
Nutrient Content Claims

• Using the term “antioxidant” in a nutrient content claim:
  • The nutrient must have an RDI
  • The nutrient must qualify for a “high” or “good source” claim
  • Must have accepted antioxidant activity
  • The name of the nutrient must be included in the claim
  • Nutrients that can qualify include Vitamin A (as beta-carotene), Vitamin C, and Vitamin E

  e.g. “High in antioxidant Vitamin C”
Structure/Function Claims

- Relates a nutrient to the normal structure or function of the human body
- FDA does not require notification or a disclaimer for this type of claim on conventional foods
- In no way suggests relationship to disease or disease prevention (including pictures or symbols that are related to disease e.g. heart symbol or EKG tracing)
- Should have substantiating evidence to support claim

- “Calcium helps build strong bones”
- “Fiber promotes bowel regularity”
- “Vitamin C supports the immune system”
- “Antioxidants promote cell integrity”
Nutrient Profiles

- USDA Food Composition Database
- Publicly available database of nutrition information
- Has information on manufactured food products and produce
## Blackberries

### Blackberries, raw

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Unit</th>
<th>Value per 100 g</th>
<th>1 cup = 144.0g</th>
<th>DV</th>
<th>%DV in 100 g</th>
<th>%DV in 1 cup = 144.0g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber, total dietary</td>
<td>g</td>
<td>5.3</td>
<td>7.6</td>
<td>25</td>
<td>21.2%</td>
<td>30.4%</td>
</tr>
<tr>
<td>Vitamin C, total ascorbic acid</td>
<td>mg</td>
<td>21</td>
<td>30.2</td>
<td>60</td>
<td>35.0%</td>
<td>50.3%</td>
</tr>
<tr>
<td>Vitamin A, IU</td>
<td>IU</td>
<td>214</td>
<td>308</td>
<td>5000</td>
<td>4.3%</td>
<td>6.2%</td>
</tr>
<tr>
<td>Vitamin E (alpha-tocopherol)</td>
<td>mg</td>
<td>1.17</td>
<td>1.68</td>
<td>20</td>
<td>5.9%</td>
<td>8.4%</td>
</tr>
</tbody>
</table>

- "High":
- "Good Source":

[Image of blackberries]
Blueberries

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Value per 100 g</th>
<th>1 cup = 148.0g</th>
<th>DV</th>
<th>%DV in 100g</th>
<th>%DV in 1 cup = 148.0g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber, total dietary</td>
<td>2.4 g</td>
<td>3.6</td>
<td>25</td>
<td>9.6%</td>
<td>14.4%</td>
</tr>
<tr>
<td>Vitamin C, total ascorbic acid</td>
<td>9.7 mg</td>
<td>14.4</td>
<td>60</td>
<td>16.2%</td>
<td>24.0%</td>
</tr>
<tr>
<td>Vitamin A, IU</td>
<td>54 IU</td>
<td>80</td>
<td>5000</td>
<td>1.1%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Vitamin E (alpha-tocopherol)</td>
<td>0.57 mg</td>
<td>0.84</td>
<td>20</td>
<td>2.9%</td>
<td>4.2%</td>
</tr>
</tbody>
</table>

“High”           “Good Source”
### Currants

#### Currants, european black

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Unit</th>
<th>Value per 100 g</th>
<th>1 cup = 112.0g</th>
<th>DV</th>
<th>100 g</th>
<th>1 cup = 112.0g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin C, total ascorbic acid</td>
<td>mg</td>
<td>181</td>
<td>202.7</td>
<td>60</td>
<td>301.7%</td>
<td>337.8%</td>
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<tr>
<td>Vitamin A, IU</td>
<td>IU</td>
<td>230</td>
<td>258</td>
<td>5000</td>
<td>4.6%</td>
<td>5.2%</td>
</tr>
<tr>
<td>Vitamin E (alpha-tocopherol)</td>
<td>mg</td>
<td>1</td>
<td>1.12</td>
<td>20</td>
<td>5.0%</td>
<td>5.6%</td>
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</table>

#### Currants, red and white

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Unit</th>
<th>Value per 100 g</th>
<th>1 cup = 112.0g</th>
<th>DV</th>
<th>100 g</th>
<th>1 cup = 112.0g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber, total dietary</td>
<td>g</td>
<td>4.3</td>
<td>4.8</td>
<td>25</td>
<td>17.2%</td>
<td>19.2%</td>
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<tr>
<td>Vitamin C, total ascorbic acid</td>
<td>mg</td>
<td>41</td>
<td>45.9</td>
<td>60</td>
<td>68.3%</td>
<td>76.5%</td>
</tr>
<tr>
<td>Vitamin A, IU</td>
<td>IU</td>
<td>42</td>
<td>47</td>
<td>5000</td>
<td>0.8%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Vitamin E (alpha-tocopherol)</td>
<td>mg</td>
<td>0.1</td>
<td>0.11</td>
<td>20</td>
<td>0.5%</td>
<td>0.6%</td>
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</tbody>
</table>

“High”  
“Good Source”
## Nutrient Profile

### Gooseberries, raw

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Unit</th>
<th>Value per 100 g</th>
<th>1 cup = 150.0g</th>
<th>DV</th>
<th>%DV in 100 g</th>
<th>%DV in 150.0g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber, total dietary</td>
<td>g</td>
<td>4.3</td>
<td>6.5</td>
<td>25</td>
<td>17.2%</td>
<td>26.0%</td>
</tr>
<tr>
<td>Vitamin C, total ascorbic acid</td>
<td>mg</td>
<td>27.7</td>
<td>41.5</td>
<td>60</td>
<td>46.2%</td>
<td>69.2%</td>
</tr>
<tr>
<td>Vitamin A, IU</td>
<td>IU</td>
<td>290</td>
<td>435</td>
<td>5000</td>
<td>5.8%</td>
<td>8.7%</td>
</tr>
<tr>
<td>Vitamin E (alpha-tocopherol)</td>
<td>mg</td>
<td>0.37</td>
<td>0.56</td>
<td>20</td>
<td>1.9%</td>
<td>2.8%</td>
</tr>
</tbody>
</table>

- **“High”**
- **“Good Source”**
<table>
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<th>Unit</th>
<th>Value per 100 g</th>
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<th>%DV in 100 g</th>
<th>%DV in 1 cup = 123.0g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber, total dietary</td>
<td>g</td>
<td>6.5</td>
<td>8</td>
<td>25</td>
<td>26.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>32.0%</td>
</tr>
<tr>
<td>Vitamin C, total ascorbic acid</td>
<td>mg</td>
<td>26.2</td>
<td>32.2</td>
<td>60</td>
<td>43.7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>53.7%</td>
</tr>
<tr>
<td>Vitamin A, IU</td>
<td>IU</td>
<td>33</td>
<td>41</td>
<td>5000</td>
<td>0.7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.8%</td>
</tr>
<tr>
<td>Vitamin E (alpha-tocopherol)</td>
<td>mg</td>
<td>0.87</td>
<td>1.07</td>
<td>20</td>
<td>4.4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.4%</td>
</tr>
</tbody>
</table>
Strawberries

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Unit</th>
<th>Value per 100 g</th>
<th>1 cup = 152.0g</th>
<th>DV</th>
<th>%DV in 100 g</th>
<th>%DV in 152.0g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber, total dietary</td>
<td>g</td>
<td>2</td>
<td>3</td>
<td>25</td>
<td>8.0%</td>
<td>12.0%</td>
</tr>
<tr>
<td>Vitamin C, total ascorbic acid</td>
<td>mg</td>
<td>58.8</td>
<td>89.4</td>
<td>60</td>
<td>98.0%</td>
<td>149.0%</td>
</tr>
<tr>
<td>Vitamin A, IU</td>
<td>IU</td>
<td>12</td>
<td>18</td>
<td>5000</td>
<td>0.2%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Vitamin E (alpha-tocopherol)</td>
<td>mg</td>
<td>0.29</td>
<td>0.44</td>
<td>20</td>
<td>1.5%</td>
<td>2.2%</td>
</tr>
</tbody>
</table>

“High”  “Good Source”
Petitions for New Health Claims

- 21 CFR 101.70
  - Outlines requirements and procedures for submitting a new health claim for review by the FDA
  - Potential endeavor for growers associations


