### Unearthing Mushrooms’ Nutritional Treasure

#### Mushrooms’ Nutritional Profile
Although often grouped with vegetables, mushrooms are fungi and provide many of the attributes of fruits and vegetables, as well as nutrients more commonly found in meat, beans or grains. New data in the USDA Nutrient Database shows that mushrooms are low in calories, fat-free, cholesterol-free and very low in sodium, yet they are also an important source of several nutrients including B-vitamins riboflavin, niacin and pantothenic acid; the antioxidant selenium; potassium; copper; and phosphorus.

The September 2006 issue of *Nutrition Today*, states that mushrooms are approximately 92% water by weight, which contributes to mushrooms’ very low energy density rating. Low energy-dense foods help people feel full on fewer calories. Thus, mushrooms can be a delicious and filling food for those watching their weight, cholesterol, blood glucose or blood pressure. (Please see page four for more information on the nutritional profiles of mushrooms.)

#### Antioxidants in Mushrooms
Despite the nutrients found in mushrooms, the focus on antioxidants in brightly colored fruits and vegetables has unintentionally left mushrooms in the dark. Penn State University researchers have unveiled a body of evidence that suggests mushrooms provide more antioxidants than commonly thought. A study published in the December 2006 issue of the *International Journal of Medicinal Mushrooms* found that a serving of white, Portabella, or crimini (brown) mushrooms contain 2.8-4.9 mg of the antioxidant L-ergothioneine.

Research presented at the 2006 Institute of Food Technologist Conference looked at L-ergothioneine and polyphenols in mushrooms and found that the antioxidant capacity of White button mushrooms, based on the ORAC assay score, is comparable to that of colorful vegetables such as tomatoes, green peppers, pumpkin, and carrots. It also found that the antioxidant capacities of crimini and Portabella mushrooms are comparable to that of green beans, red peppers and broccoli. While more research is needed on the antioxidant components of mushrooms, this research is just the beginning of what is sure to be an exciting journey into a fuller understanding of ‘mushrooms’ role in health.

### WHAT THE SCIENCE SAYS ABOUT MUSHROOMS

#### Antioxidants

#### Cancer

#### Lipid Control

#### Nutrient Composition

#### Vitamin D

#### Weight Management

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*E-mazing News About Mushrooms* is a publication of the Mushroom Council for food and nutrition professionals. Feel free to share this with your colleagues and clients. For more information call 408-432-7210.
Unveiling How to Buy and Prepare Mushrooms

**SELECTION** Look for firm mushrooms with a fresh, smooth and flawless complexion. The surfaces should be dry, but not dried out, and appear plump. The veil under the cap actually reveals a lot about flavor. A closed veil under the cap mushroom indicates a delicate flavor; while an open veil and exposed gills result in a richer flavor.

**STORAGE** How mushrooms are stored is an important part of maximizing freshness and flavor. Remember these key points:
- Mushrooms keep for up to a week in the refrigerator.
- Keep mushrooms in original packaging until ready to use.
- Once opened, store mushrooms in a brown paper bag.
- Fresh mushrooms should never be frozen, but frozen sautéed mushrooms will keep for up to a month.

**CLEANING** Gently wipe mushrooms with a damp paper towel or a soft brush. Another option is to quickly rinse them with cold water just before use; and pat dry.

**TRIMMING** The stems of white, crimini and portabella mushrooms are edible and typically need only a little trimming at the ends. Shiitake and oyster mushroom stems tend to be tough and should be removed before cooking.

**Microwaving** is a quick method to prepare mushrooms without any added fat.
1. Place eight ounces of thickly sliced mushrooms in a microwaveable bowl.
2. Cover and cook on 100% power for two to three minutes.

**Grilling and Broiling** is preferable for larger capped mushrooms, like Portabellas and shiitakes.
1. Lightly brush mushrooms with oil to keep them moist.
2. Season with salt and pepper.
3. Grill or broil 4 to 6 inches from heat source for 4 to 6 minutes on each side.

**Roasting** is a terrific way to bring out the savory flavor of mushrooms.
1. Preheat oven to 450°F.
2. Brush mushrooms with oil and place on a shallow baking sheet. Use about one tablespoon of oil for eight ounces of mushrooms
3. Roast for about 20 minutes until brown; stir occasionally.

Visit www.mushroominfo.com for more information on mushroom usage ideas and recipes.

**Success with Shrooms**

**Sautéing** is an easy way to cook whole, sliced or chopped mushrooms.
1. Brush pan with oil or butter, and heat on high
2. Add a single layer of mushrooms; turn once mushrooms become reddish brown on one side.
3. Cook until the other side turns the same color, remove from heat and season to taste.

**Try these tips to add flavor and nutrition to your meals:**
- Slice and sauté **white button** mushrooms to top a pizza, toss in pasta or wrap in a quesadilla.
- Combine the earthy flavor and hearty textured **crimini** mushrooms with beef, poultry or veggie dishes.
- Marinate and grill meaty **Portabellas** and serve on a bun for a unique veggie burger experience.
- Heat **shiitakes** and add to everything from vegetable to meat-based dishes to illuminate the unique richness and texture of this mushroom variety.

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<table>
<thead>
<tr>
<th>Mushroom Varieties</th>
<th>Description</th>
<th>Flavor</th>
<th>Preparation</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shiitake</td>
<td>Text evokes brown mantles and has broad caps</td>
<td>Flavor: They are rich and worldly when cooked.</td>
<td>Preparation: taste best when cooked.</td>
<td>Uses: They add a meaty flavor and texture to dishes, pastas, soups, salads, and sides.</td>
</tr>
<tr>
<td>Maitake</td>
<td>Appearance: gills and fruiting body are light brown and white, with a fairly firm texture.</td>
<td>Flavor: They have a distinctively aromatic, earthy, and sweet taste.</td>
<td>Preparation: Sauté lightly in butter or oil.</td>
<td>Uses: For a rich taste in any recipe calling for mushrooms.</td>
</tr>
<tr>
<td>Oyster</td>
<td>Color: gray, pale yellow, or mixed blue, with a very delicate texture.</td>
<td>Flavor: Oysters have a very delicate flavor.</td>
<td>Preparation: Sauté with butter and onions to bring out their flavor.</td>
<td>Uses: Try them raw in salads and sandwiches. They can be marinated, or used as a stock base in soups.</td>
</tr>
<tr>
<td>Enoki</td>
<td>Transparent, long, and slender stems.</td>
<td>Flavor: They are mild and crunchy.</td>
<td>Preparation: Before using, separate the bases and clean the cap.</td>
<td>Uses: Try them raw in salads and appetizers.</td>
</tr>
<tr>
<td>Portobello</td>
<td>Large, brown cap that measures up to 10 inches in diameter.</td>
<td>Flavor: They have a deep, earthy, and rich flavor.</td>
<td>Preparation: They can be grilled, sautéed, or roasted.</td>
<td>Uses: Try them raw in salads, soups, and appetizers.</td>
</tr>
<tr>
<td>Cremini</td>
<td>They have a hearty, earthy, and rich flavor.</td>
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<td>Preparation: They can be grilled, sautéed, or roasted.</td>
<td>Uses: Try them raw in salads, soups, and appetizers.</td>
</tr>
<tr>
<td>White Button</td>
<td>They have a hearty, earthy, and rich flavor.</td>
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</table>

*Note: The table contains information about various mushroom varieties, including their color, appearance, flavor, preparation methods, and typical uses in recipes.*
## Mushrooms' Nutritional Treasure

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>White</th>
<th>Crimini</th>
<th>Portabella</th>
<th>Enoki</th>
<th>Oyster</th>
<th>Maitake</th>
<th>Shiitake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>18</td>
<td>23</td>
<td>22</td>
<td>37</td>
<td>29</td>
<td>31</td>
<td>37</td>
</tr>
<tr>
<td>Fat gm (% Daily Value)</td>
<td>0.3 (1%)</td>
<td>0.1 (0%)</td>
<td>0.2 (0%)</td>
<td>0.3 (1%)</td>
<td>0.3 (1%)</td>
<td>0.2 (0%)</td>
<td>0.3 (1%)</td>
</tr>
<tr>
<td>Total Carbohydrate gm (% Daily Value)</td>
<td>2.8 (1%)</td>
<td>3.5 (1%)</td>
<td>4.3 (1%)</td>
<td>6.4 (2%)</td>
<td>5.4 (2%)</td>
<td>5.7 (2%)</td>
<td>6 (2%)</td>
</tr>
<tr>
<td>Total Fiber gm (% Daily Value)</td>
<td>0.8 (3%)</td>
<td>0.5 (2%)</td>
<td>1.3 (5%)</td>
<td>2.3 (9%)</td>
<td>1.9 (8%)</td>
<td>2.3 (9%)</td>
<td>2.8 (11%)</td>
</tr>
<tr>
<td>Protein gm (% Daily Value)</td>
<td>2.6 (5%)</td>
<td>2.1 (4%)</td>
<td>2.1 (4%)</td>
<td>2.1 (4%)</td>
<td>2.8 (6%)</td>
<td>1.6 (3%)</td>
<td>2.7 (5%)</td>
</tr>
<tr>
<td>Sodium mg (% Daily Value)</td>
<td>4 (0%)</td>
<td>5 (0%)</td>
<td>5 (0%)</td>
<td>3 (0%)</td>
<td>15 (0%)</td>
<td>1 (0%)</td>
<td>4 (0%)</td>
</tr>
<tr>
<td>Riboflavin mg (% Daily Value)</td>
<td>0.3 (18%)</td>
<td>0.4 (24%)</td>
<td>0.4 (24%)</td>
<td>0.1 (6%)</td>
<td>0.3 (18%)</td>
<td>0.2 (12%)</td>
<td>0.2 (12%)</td>
</tr>
<tr>
<td>Niacin mg (% Daily Value)</td>
<td>3 (15%)</td>
<td>3.2 (16%)</td>
<td>3.8 (19%)</td>
<td>4.9 (25%)</td>
<td>4.2 (21%)</td>
<td>5.5 (28%)</td>
<td>3 (15%)</td>
</tr>
<tr>
<td>Copper mg (% Daily Value)</td>
<td>0.3 (15%)</td>
<td>0.4 (20%)</td>
<td>0.3 (15%)</td>
<td>0.1 (5%)</td>
<td>0.2 (10%)</td>
<td>0.2 (10%)</td>
<td>0.1 (5%)</td>
</tr>
<tr>
<td>Pantothenic Acid mg (% Daily Value)</td>
<td>1.2 (12%)</td>
<td>1.3 (13%)</td>
<td>1.3 (13%)</td>
<td>0.9 (9%)</td>
<td>1.1 (11%)</td>
<td>0.2 (10%)</td>
<td>1.1 (11%)</td>
</tr>
<tr>
<td>Selenium µg (mcg) (% Daily Value)</td>
<td>7.8 (11%)</td>
<td>21.8 (31%)</td>
<td>9.2 (13%)</td>
<td>1.8 (3%)</td>
<td>2.2 (3%)</td>
<td>1.8 (3%)</td>
<td>4.9 (7%)</td>
</tr>
<tr>
<td>Potassium mg (% Daily Value)</td>
<td>267 (8%)</td>
<td>376 (11%)</td>
<td>407 (12%)</td>
<td>309 (9%)</td>
<td>353 (10%)</td>
<td>171 (5%)</td>
<td>254 (7%)</td>
</tr>
<tr>
<td>Thiamin mg (% Daily Value)</td>
<td>0.1 (7%)</td>
<td>0.1 (7%)</td>
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</tr>
<tr>
<td>Vitamin B6 mg (% Daily Value)</td>
<td>0.1 (5%)</td>
<td>0.1 (5%)</td>
<td>0.1 (5%)</td>
<td>0.1 (5%)</td>
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<td>0 (5%)</td>
<td>0.1 (5%)</td>
</tr>
<tr>
<td>Vitamin D IU (% Daily Value)</td>
<td>15 (4%)</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>Folate µg (mcg) (% Daily Value)</td>
<td>13 (3%)</td>
<td>12 (3%)</td>
<td>18 (5%)</td>
<td>44 (11%)</td>
<td>23 (6%)</td>
<td>24 (6%)</td>
<td>11 (3%)</td>
</tr>
<tr>
<td>Magnesium mg (% Daily Value)</td>
<td>8 (2%)</td>
<td>8 (2%)</td>
<td>9 (2%)</td>
<td>13 (3%)</td>
<td>15 (4%)</td>
<td>8 (2%)</td>
<td>15 (4%)</td>
</tr>
<tr>
<td>Zinc mg (% Daily Value)</td>
<td>0.4 (3%)</td>
<td>0.9 (6%)</td>
<td>0.5 (3%)</td>
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<td>0.7 (5%)</td>
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<tr>
<td>Iron mg (% Daily Value)</td>
<td>0.4 (2%)</td>
<td>0.3 (2%)</td>
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</table>


2. Based on FDA reference serving size of 84 grams for raw mushrooms. Shiitake values are based on a ½ cup cooked serving.

3. Based on the reference serving amount. 10-19% of the Daily Value (% DV) is a "good source" of the nutrient. 20% or more of the Daily Value is a "high, rich in or excellent source" of the nutrient.

*Not a significant source of saturated fat, trans fat, cholesterol, sugars, vitamin A and calcium.