CPE: Is Wine a Functional Food?

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Wine is no ordinary beverage. Wine has long been considered soothing for both the body and spirit. According to Plato, “No thing more excellent nor more valuable than wine was ever granted mankind by God.” It may even surprise you to learn that grapevines and wine are mentioned in the Bible more than any other plant (www.intowine.com, Accessed 1/22/04).

Wine is the alcoholic beverage of choice with meals, and 80 percent of all wine is consumed at home. Per capita, France consumes the most wine, followed by Italy, the United States, Germany, and Spain. Wine consumption has increased steadily over the past 20 years and is expected to continue to increase. In the US, sales of domestic and imported wine rose 4 percent in 2007, for a total retail value of $30 billion, making the US the largest retail wine market in the world. Table wine sales make up the majority of retail sales, followed by dessert wines, then sparkling wines (Clark, 2007).

Strong consumer interest is one reason for the consistent increase in annual sales (Clark, 2007). One consumer interest is health. The potential health benefits of wine first received widespread US attention in November 1991, when 60 Minutes featured a report on the “French Paradox,” a term coined to describe the finding that, although many French eat excessive amounts of saturated fats, have elevated cholesterol levels, smoke cigarettes and get very little exercise, they have one of the lowest heart attack rates in the world. Their regular moderate daily intake of red wine with meals was, and remains, the most likely explanation for this phenomenon.

Sales of red wine soared within weeks of the airing of this show (www.intowine.com, Accessed 1/22/04). In the 1990s, Baby Boomers, who were in their 30s and 40s, were beginning to worry about their cardiovascular health and contributed to the increase in sales. Today the oldest Baby Boomers are in their 60s and concern regarding cardiovascular health remains high on their list of health concerns.

Were they foolish in believing that a glass of Cabernet or Shiraz a day could help prevent heart disease? More to the point, and more in today’s lexicon, should we consider wine a “functional food?”

Functionality

Functional foods are foods that contain physiologically active food components and therefore provide health benefits beyond basic nutrition. “Basic nutrition” provides for normal growth and development, while “beyond basic nutrition” refers to disease-
Is Wine a Functional Food?

Many questions have been raised concerning the functionality of wine. What are the phytochemical components that offer disease protection? Do other sources of alcohol promote health benefits? Is it wine that offers disease protection or the lifestyles typical of wine drinkers? How much wine provides health benefits, but is not detrimental to a person's health? Some of these questions can be answered in this article, but more research is needed before we can definitely answer other questions (www.tastersguildny.com, accessed 1/22/04).

Winemaking

Let's begin by reviewing some basic information about wine. Wine is made from specially cultivated grapes. Wine growers carefully select the variety of grapes they will grow based on their particular soil and climate. Grapevines start their cycle in April, flower within about six weeks, and are harvested in the fall. Grapes are considered ripe when they have achieved the proper balance of sugar and acidity. The composition of grapes is about 80 percent water and about 20 percent sugar. Wine grapes are harvested when their sugar content is high. High sugar content is necessary for yeast to act on the sugar and convert it to alcohol during fermentation. In contrast, table, or “eating” grapes are harvested when their sugar content is relatively low. Wine grapes are smaller and have thinner skins than table grapes, which need thicker skins so they can be handled and transported (www.tastersguildny.com, accessed 1/22/04).

Wines are divided into two basic categories, red and white. A wine’s color comes from contact with the grape skins. Red, or more accurately purple-blue, grapes generally produce red wines and white or yellow grapes produce white wines. Both red and white grapes are yellow-gray inside. Wines can be lighter or darker in color, depending on their contact with the skins and the thickness of the skins. White grapes are pressed and their skins removed before they are fermented. Red grapes can be used to make white wine if their skins are removed before fermentation.

After harvesting, grapes are placed into vats where yeast can form naturally on the grapes. Fermentation occurs, resulting in the conversion of grape juice into ethyl alcohol, or ethanol. After fermentation, the new wine is drawn off the vats and placed into wooden barrels or stainless steel tanks for aging before bottling (www.tastersguildny.com, accessed 1/22/04).

The ethyl alcohol (CH3CH2OH) in wine is the same type of alcohol found in all alcoholic drinks. A typical 4 oz glass of wine has about 100 kcal and contains water (250 gm), ethyl alcohol (25 gm), glycerine (3 gm), pectins (1 gm), acids (1 gm), polyphenols (500 mg), and traces of flavor elements. It is primarily the alcohol in wine that provides the calories. Alcohol, like carbohydrates, protein, and fat, is an energy source for the body. One gram of alcohol provides 7 kcal.

Functional Components of Wine

Many scientific studies have indicated that moderate wine-drinking protects against cardiovascular disease (CVD) (Goldberg, et al., 2001). In addition, recent preliminary studies are emerging that indicate wine may play a potential role in protecting against certain cancers, cognitive decline, dementia, and reduced lung function, as well as increasing longevity (Goldberg, et al., 2001; Scalbert and Williamson, 2000; Mukamal, et al., 2003; Catchpole, 2003; www.sciencedaily.com. Accessed 2002; McElderry, 1999; Sacanella, et al., 2008; Baik and Shin, 2008; Geleijnse and Hollman, 2008; Barger, et al., 2008).

The health benefits of wine are largely attributed to phytochemicals in wine. A foundational knowledge of phytochemicals is necessary to understanding the emerging research regarding wine’s functionality. The following section defines, describes, and discusses the major phytochemicals in wine.

• Polyphenols: The most abundant antioxidants in our diets are polyphenols. Antioxidants protect against cellular damage caused by free radicals in the body. Cellular damage caused by free radicals can lead to development of diseases like heart disease and cancer (Scalbert and Williamson, 2000). Many phytochemicals act as antioxidants.

Several thousand natural polyphenols have been identified. Polyphenols are not evenly distributed in plants. The majority of polyphenols are located in the skins or peelings of fruits.

Grape polyphenols are located primarily in the skins. These polyphenols give red wine its color and its ability to age well. As noted, white grapes are pressed and their skins removed before they are placed in vats and fermented. Thus, white wine has a lower concentration of polyphenols than red wine, and does not age as well (Scalbert and Williamson, 2000). These phytochemicals give red wine its profound, astringent taste.

Most of the data on polyphenol content of foods are from scattered sources (Scalbert and Williamson, 2000), and it is difficult to estimate the polyphenol content of foods due to the diversity of their chemical structures. Polyphenols have very complex chemical structures, consisting of several benzene rings. Their chemical structure makes them distinct from other antioxidants, contributes to their strong antioxidant properties, and determines their bioavailability, metabolism, and absorption.

A few human studies have suggested that a large percentage—75 to 100 percent—of ingested polyphenols are either absorbed through the gastrointestinal tract, absorbed and...
excreted in bile, or metabolized by the colonic microflora or other body tissues. Repeated dietary intake of polyphenols is necessary to maintain high plasma levels of polyphenols (Scalbert and Williamson, 2000).

**Categories of Polyphenols:**
Polyphenols include four categories of compounds, grouped according to their chemical configuration: phenolic acids, flavonoids, lignans, and stilbenes. Within each category there are several classes of compounds (Scalbert and Williamson, 2000; Brannon, 2008). These categories and the classes of polyphenols and their food sources are listed in the following chart.

Wine, particularly red wine, is a rich source of a variety of phenolics, flavonoids, and resveratrol, a class of stilbenes. It is estimated that a 4 oz glass of wine contains about 200 different types of polyphenols. Different varieties of grapes have different compositions of polyphenols (Scalbert and Williamson, 2000).

The flavonoids are the most abundant polyphenols in our diet. More than 4,000 flavonoids have been identified. Wine contains several classes of flavonoids, including the flavonols, catechins or flavanols, anthocyanins, and procyanidins. Persons who frequently consume fruits, red wine, tea, chocolate, or beer will have higher intake of flavonoids. In general, studies have found a positive association between dietary flavonoid intake and overall good health (Scalbert and Williamson, 2000).

**Health benefits of the polyphenols in wine**

**Cardiovascular disease protection**
Polyphenols appear to play a role in protecting against cardiovascular disease (CVD) (Szmitko and Verma, 2005).

**In vitro studies** suggest that the phytochemicals in wine act by inhibiting LDL oxidation and/or by inhibiting platelet aggregation (the clumping together of particles in blood, resulting

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**Categories, Classes, & Food Sources of Polyphenols**

<table>
<thead>
<tr>
<th>Category</th>
<th>Classes</th>
<th>Major Food Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenolic acids</td>
<td>• Caffeic acid,</td>
<td>Many fruits and vegetables, coffee</td>
</tr>
<tr>
<td></td>
<td>- Chlorogenic acid</td>
<td>Mango fruit</td>
</tr>
<tr>
<td></td>
<td>• Condensed Tannins</td>
<td>Blackberries, raspberries, strawberries, wine, brandy aged in oak barrels</td>
</tr>
<tr>
<td></td>
<td>• Hydrolyzable tannins:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Gallotannins</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Ellagitannins</td>
<td></td>
</tr>
<tr>
<td>Flavonoids</td>
<td>• Flavones</td>
<td>Sweet red pepper, celery</td>
</tr>
<tr>
<td></td>
<td>• Flavonols</td>
<td>Tea, onions, apples, many other fruits and vegetables</td>
</tr>
<tr>
<td></td>
<td>- Quercetin</td>
<td>Tea, especially green tea, chocolate, cocoa</td>
</tr>
<tr>
<td></td>
<td>• Flavanols:</td>
<td>Oranges, citrus fruits</td>
</tr>
<tr>
<td></td>
<td>- Catechins:</td>
<td>Soybeans, soy protein containing foods</td>
</tr>
<tr>
<td></td>
<td>• Flavanones:</td>
<td>Red fruits: cherries, plums, strawberries, raspberries, blackberries, grapes, red and black currants</td>
</tr>
<tr>
<td></td>
<td>- Hesperetin</td>
<td>Apples, pears, grapes, red wine, tea</td>
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<tr>
<td></td>
<td>- Isoflavones:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Genistein</td>
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<tr>
<td></td>
<td>- Daidzein</td>
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<tr>
<td></td>
<td>• Anthocyanins:</td>
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</tr>
<tr>
<td></td>
<td>- Cyanidin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Proanthocyanidins</td>
<td></td>
</tr>
<tr>
<td>Lignans</td>
<td>• Enterodiol</td>
<td>Flaxseed, flaxseed oil</td>
</tr>
<tr>
<td>Stilbenes</td>
<td>• Resveratrol</td>
<td>Red wine</td>
</tr>
</tbody>
</table>

This is not an exhaustive list.
in blood clot formation or thrombosis, which occurs prior to a heart attack). More research is needed to determine conclusively the mode of action. Although in vitro studies support the ability of phenolic compounds to inhibit LDL oxidation, it is unclear if they have this same effect in humans. Oxidized LDL particles cause cellular injury that leads to plaque formation and ultimately the development of atherosclerosis. Therefore, the inhibition of LDL oxidation is important in preventing or delaying the progression of CVD.

Many in vitro studies also indicate that light-to-moderate consumption of alcoholic beverages, including but not limited to, wine, inhibit platelet aggregation. This decrease in platelet aggregation probably involves specific polyphenols (Goldberg, et al., 2001). Quercetin, a flavonoid in wine, is a potent inhibitor of platelet aggregation. Two other polyphenols, catechin and resveratrol are less potent inhibitors (McElroy, 1999).

Clinical studies: One clinical study found that red wine intake reduced the susceptibility of low-density lipoprotein cholesterol (LDL) to oxidation (Nigdikar, et al., 1998). Another study found that blood antioxidant activity was increased after wine intake (Maxwell, et al., 1994). According to a study of 15 patients with coronary artery disease, daily intake of purple grape juice, a rich source of flavonoids, was also effective in reducing the susceptibility of LDL cholesterol to oxidation (Stein, et al., 1999). The finding of this study raises the question of whether it is the alcohol itself or the wine polyphenols that offers disease protection.

Resveratrol. Within the past few years increasing attention has been focused on resveratrol, which is found in high amounts in grape skins and red wines and in lower amounts in grape juice, mulberries, and peanuts. Resveratrol is a phytoalexin, a type of antibiotic compound produced by plants to help defend against diseases like fungal infections that affect grapevines, especially grapevines grown in cooler climates (McElroy, 1999). For centuries resveratrol has been used as an ingredient in traditional Japanese and Chinese medicines to treat a variety of conditions including inflammation and CVD. Like other polyphenols, it is an antioxidant and has been found to protect against CVD (Waterhouse, accessed 1/28/2004). Today nutritional supplements containing resveratrol are being marketed as “The French Paradox in a bottle” (Balk, 2002). However, more research is needed before recommending resveratrol supplements.

The search for the “Fountain of Youth” continues and some scientists believe that resveratrol is a key ingredient. At least one pharmaceutical corporation, GlaxoSmithKline, is investing over $700 million in researching the potential anti-aging effect of resveratrol on sirtuins, protein agents in humans.

This area of research first began 20 years ago, but has recently opened up. This research involves the proposed ancient biological survival mechanism, that of switching the body’s resources from fertility to tissue maintenance. It appears that if tissue maintenance is improved, then longevity and quality of life is greater because there is a reduction in the degenerative diseases of aging. It has been shown in laboratory rodents by up to 30 percent.

However, this theory has yet to be consistently proven in humans. Regardless, adhering to a calorie-restricted diet is not feasible for many humans. Recent interest has surged because it appears that resveratrol administration in mice can trigger a similar improvement in tissue maintenance by activating sirtuins, resulting in increased longevity and quality of life. It should be noted that, in a study involving rodents, the amount of resveratrol administered was equivalent to that obtained from drinking 100 bottles of wine a day (35 bottles a day in another study). Researchers are looking into extracting resveratrol and using it as a key ingredient in new and yet-to-be developed “anti-aging” drugs. More research, particularly in the form of clinical trials, is needed (Barger, et al., 2008).

• Potential breast cancer protection

The chemical structure of resveratrol is similar to estradiol, an endogenous estrogen, and diethylstilbestrol, a synthetic estrogen. Initial in vitro and in vivo (mice) studies indicate that resveratrol inhibits the growth of malignant tumors of the breast and prostate (17). Studies indicate resveratrol may have both an estrogen agonist and antagonist effect, depending on the dosage of resveratrol and the presence of estradiol. It has been suggested that resveratrol may have an agonist effect in postmenopausal women, but exert an antagonist effect in premenopausal women. If proven, this hypothesis would explain the increased risk of breast cancer among postmenopausal women who drink wine, but not among premenopausal women (McElroy, 1999; Balk, 2002; Feigelson, et al., 2001; Bove, 2002).

In vitro and in vivo studies indicate that the procyanidins dimmer in red wine and grapes may suppress estrogen biosynthesis, which is associated with breast cancer development (Eng, et al., 2003).

• Potential skin cancer protection

Recent in vitro and in vivo (mice) studies suggest that resveratrol inhibits the
growth of nonmelanoma skin cancer, the most common cancer caused by overexposure to solar ultraviolet radiation (Gaffney, 2003; Afaq, et al., 2003). More research is needed before drawing any firm conclusions regarding the chemopreventative role of resveratrol in humans.

Alcohol: Functional component or health hazard?

Besides the likely benefit of polyphenols in wine, could it also be that alcohol itself is a functional ingredient? It has been suggested that moderate alcohol intake — one to two drinks a day — may provide some health benefits. One “drink” is defined as 5 oz of wine, 12 oz of regular beer, or 1.5 oz of distilled spirits (www.ncadd.org, accessed 2/4/2003).

In vivo studies of atherosclerosis-prone mice demonstrate that addition of alcohol to their diet decreased atherosclerosis (Goldberg, et al., 2001). Alcohol intake increases high-density lipoprotein (HDL) cholesterol levels. On average one to two drinks per day may increase HDL levels by an average of approximately 12 percent (Goldberg, et al., 2001). HDL cholesterol is known as the “good” cholesterol.

Clinical studies: Prospective clinical studies have found that moderate alcohol consumption is associated with decreased total mortality rates. However, higher daily alcohol intake, as outlined in the following chart, is associated with an increase total mortality (Goldberg, et al., 2001).

We all know that alcohol intake can be hazardous to health. In fact, over 60 negative health effects have been associated with alcohol consumption (Gutjahr, et al., 2001). Alcohol is considered a depressant drug because it slows down brain activity. Long-term abuse of alcohol can result in dependence or alcoholism. Alcoholism can lead to life-threatening liver disease. For many people, alcohol is a source of excess calories and can result in elevated triglyceride levels, or hypertriglyceridemia, a risk factor for CVD. In addition, alcohol-related hypertriglyceridemia can exacerbate pancreatitis (Goldberg, et al., 2001).

It has also been suggested that alcohol may be a pro-oxidant because excessive alcohol intake is associated with mouth and throat cancers. It is unclear what the effects or role of alcohol, as a component of wine, play in promoting health benefits or disease development (Goldberg, et al., 2001).

The Nurses’ Health Study, a large study involving women aged 30 to 55 years, indicates an association between daily intake of about two drinks and an increased risk of high blood pressure. This association is also true for men. Daily alcohol intake greater than one to two drinks is a clear risk factor for hypertension (Goldberg, et al., 2001).

There is agreement that chronic, heavy alcohol intake increases a person’s risk of all types of strokes, especially hemorrhagic strokes. The effect of moderate alcohol intake on stroke risk is less clear due to the conflicting findings of different studies. Some studies indicate that moderate alcohol intake may protect against strokes (Goldberg, et al., 2001).

Is Wine a Functional Food?

So, there is evidence for and against alcohol in general, and wine in particular. Let’s look at some significant findings from clinical studies about the health benefits of wine regarding cardiovascular disease, lung conditions, mental functioning, and certain cancers.

• Cardiovascular Protection: In 1992 a study by Renaud and de Lorgeril formally established the truth of the “French Paradox,” and proposed that moderate intake of red wine is associated with the low mortality rate in populations that consume a high-fat diet and have high blood cholesterol levels. There are now over 60 prospective studies that support this hypothesis.

In addition, a prospective cohort study involving over 36,000 healthy French men found that moderate wine drinking was associated with a lower hypertension-related mortality (Renaud, et al., 2004).

Moderate alcohol consumption is associated with a lower risk of myocardial infarction or heart attack, but whether alcohol is truly protective or whether the amount, type, or pattern...
of intake is the most important factor is still under debate. A study involving slightly more than 4,000 participants in Costa Rica found that low to moderate consumption, defined as 1 to 2 drinks per week, was independently associated with a reduced risk of heart attack (Kabagambe, et al., 2005).

It has not been clearly proven that red wine is more beneficial than other alcoholic beverages, although some studies have suggested that wine is more beneficial than beer or spirits (Goldberg, et al., 2001; Janszky, et al., 2005). A recent study involving women who had recently suffered an acute heart attack or undergone a revascularization procedure, angioplasty or coronary artery bypass grafting found an association between wine drinking and increased heart rate variability (HRV), but no association was found between intake of spirits or beer and HRV (Janszky, et al., 2005).

To summarize, there is much evidence to support the hypothesis that moderate alcohol, particularly red wine, offers cardiovascular protection. More research is needed to determine and clarify the mechanisms of this cardiovascular protection (Parks and Booyse, 2002; Retterstol, et al., 2005). The chart below summarizes the possible cardiovascular health benefits versus adverse effect associated with alcohol intake.

- **Lungs**: Recent studies indicate that moderate wine drinking, one to three drinks daily, may improve lung function and capacity and even suppress lung diseases such as chronic obstructive pulmonary disease (COPD), emphysema, and chronic bronchitis. One study involving 1,555 men and women reported that white wine appeared to be more strongly related to better lung function than red wine. One glass of wine daily equaled a 1.5 percent higher lung function, which could add 1 or 2 years to a person's life. Three glasses of wine per day improved lung capacity by 3 percent (Catchpole, 2003; www.sciencedaily.com, 2002).

- **Brain/Nervous System**: A recent study involving 6,000 persons reported that alcohol abstainers had about twice the odds of developing dementia compared to light drinkers (those drinking between one and six drinks weekly). Moderate drinkers (those drinking seven to 14 drinks weekly) had a 31 percent less chance of developing dementia, while heavy drinkers, (those drinking 15 or more drinks weekly) had a 22 percent lower risk of developing dementia (Mukamal, et al., 2003). More research is needed to better understand this finding.

- **Possible Cancer Protection**: Wine drinking, specifically red wine, has been linked to a reduced reduction of certain cancers (Kuper, et al., 2000; Purdie, et al., 2003). Postmenopausal women with very dense breast tissue, as determined by mammography have a higher risk (1.8 to 6 times higher) of breast cancer than women of the same age with normal breast tissue density. One study found that red wine consumption was inversely related to percentage of breast density, while white wine consumption was positively associated with breast tissue density (Purdie, et al., 2003; Eng, et al., 2003).

However, a recent study involving 6,327 women with breast cancer and 7,558 women who did not have a cancer diagnosis has challenged the assumption that red wine does not increase risk of breast cancer. The results of this study indicate that risk of breast cancer development rose with increased alcohol consumption, regardless of whether the alcohol was wine, beer, or liquor (Newcomb, et al., 2009). Thus, this

### Cardiovascular Health Benefits versus Adverse Effects Associated with Alcohol Intake

<table>
<thead>
<tr>
<th>Health Benefits Associated with Moderate Intake*</th>
<th>Adverse Effects Associated with Moderate Intake*</th>
<th>Adverse Effects Associated with Heavy Intake**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection against CHD:</td>
<td>Hypertension</td>
<td>Addiction to alcohol</td>
</tr>
<tr>
<td>• ↓ Platelet aggregation</td>
<td></td>
<td>Liver diseases:</td>
</tr>
<tr>
<td>• ↑ HDL cholesterol levels</td>
<td></td>
<td>• Fatty liver</td>
</tr>
<tr>
<td>• ↓ Susceptibility to LDL oxidation</td>
<td></td>
<td>• Hepatic encephalophy</td>
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<tr>
<td>• Improved endothelium function</td>
<td></td>
<td>• Cirrhosis</td>
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<tr>
<td>↓ CHD mortality</td>
<td></td>
<td>Fetal Alcohol Syndrome</td>
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<tr>
<td>– HTN mortality</td>
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<td>↑ Total mortality</td>
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<tr>
<td>↓ Total mortality</td>
<td></td>
<td>Pancreatitis</td>
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<tr>
<td></td>
<td></td>
<td>Certain Cancers</td>
</tr>
</tbody>
</table>

* Moderate intake = Average intake of 1-2 drinks/day
**Heavy intake = Chronic intake of more than 3 drinks per day

study concludes that moderate drinking increases breast cancer risk and that risk increases as alcohol consumption increases. For example, women who reported drinking 14 or more drinks per week were 24 percent more likely to develop breast cancer compared to non-drinkers. Women who reported drinking approximately one or two drinks per day (seven to 13.9 drinks per week) were 11 percent more likely to develop breast cancer (Newcomb, et al., 2009). This study raises questions about what advice health care professionals should be providing to their patients and clients.

**Lung Cancer:** A recent pooled analysis of cohort studies analyzed data from seven prospective studies with nearly 400,000 participants and 3,137 cases of lung cancer found that there was a slightly greater risk of developing lung cancer with the daily consumption of 30 gm or more of alcohol compared to those participants that drank no alcohol. Alcohol consumption was strongly associated with greater risk in males that had never smoked (Freudenheim, et al., 2005).

**Summary of epidemiological and observational studies**

It is important to note that epidemiological or observational studies can support a hypothesis, but cannot be definitive in declaring direct cause and effect. These studies include wide variations in methodology, error in measurement of alcohol intake, and biological variability in response to alcohol intake. In addition, other factors, including lifestyle, diet, age, race, smoking history, educational level, and cultural factors, that impact a person’s health are not taken into account (Goldberg, et al., 2001).

Studies have found that moderate drinkers are healthier overall than abstainers or heavy drinkers. However, is the better health of moderate wine drinkers due to the wine or to the typical lifestyles of most wine drinkers? Data collected from the UNC Alumni Heart Study at Duke University Medical Center, showed women prefer wine, while men prefer beer. The incomes of wine drinkers were higher than non-drinkers and drinkers of other alcoholic beverages. Wine drinkers reported eating healthier diets, in that they reported eating more servings of fruits and vegetables and fewer servings of red or fried meats, and their diets were lower in saturated fats and cholesterol and higher in fiber in comparison to persons who preferred beer or other alcoholic beverages. In addition, wine drinkers were less likely to smoke and more likely to exercise and had a lower mean body mass index (Barefoot, et al., 2002).

**Dietary recommendations**

As nutrition counselors and health care educators, we need to carefully consider what dietary recommendations we make regarding alcohol intake. Do the benefits of moderate alcohol intake outweigh the potential addictive and harmful effects? A great concern is that chronic, heavy alcohol consumption can become addictive and result in adverse health effects, including fetal alcohol syndrome, cardiomyopathy, hypertension, stroke, cardiac arrhythmia, and sudden cardiac death (Goldberg, et al., 2001).

It appears that one to two drinks per day—particularly of red wine—with meals may provide some health benefits. We need to carefully and clearly explain what “moderate intake” means and emphasize that it is best to consume wine with meals. It also appears that non-alcoholic grape juice and a diet high in fruits and vegetables offer the same benefits and disease protection (Lampe, 1999). Moderate wine drinking should not be advocated as a pro-active strategy for good health. It may be prudent to remember the words of King Solomon, “Wine is a mocker… whoever is led astray by it is not wise.”

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Is Wine a Functional Food?

Learning Objectives
At the conclusion of this course, the student will be able to:

1. Define functional foods.
2. List the functional components of wine.
3. Describe the difference between red and white wine.
4. Explain how the polyphenols quercetin, catechin, and resveratrol may act to prevent cardiovascular disease.
5. Describe the proposed health benefits associated specifically with the phytochemical resveratrol.
6. Explain why red wine is strongly associated with cardiovascular health, while white wine is not.
7. Define and describe what constitutes light, moderate, and heavy alcohol drinking.
8. List the recommended dietary guidelines for alcohol, including wine, consumption for men and women.
9. Summarize the health benefits of moderate drinking and hazards of heavy alcohol consumption.

CPE Questions - Is Wine a Functional Food?

1. Red wine:
   - a. does not age gracefully
   - b. has a sweet and mild taste due to its lower phytochemical content
   - c. has a higher concentration of polyphenols than white wine
   - d. is made by removing the skins before fermentation
   - e. all of the above

2. The most abundant polyphenols are:
   - a. flavonoids
   - b. pectins
   - c. stilbenes
   - d. isoflavones
   - e. none of the above

3. Polyphenols:
   - a. are weak antioxidants

4. Resveratrol is:
   - a. found in high concentrations in grape skins
   - b. similar to estrogen in its chemical structure
   - c. a type of antibiotic compound produced by some plants
   - d. an effective anti-cancer agent
   - e. all of the above

5. Moderate alcohol intake is defined as:
   - a. one 5-oz glasses of wine daily for women
   - b. one to two 6-oz glasses of wine daily for both men and women
   - c. three 4-oz glasses of wine daily for men only
   - d. three 6-oz glasses of wine daily
   - e. none of the above

6. Alcohol intake can:
   - a. increase HDL cholesterol and triglyceride levels
   - b. decrease HDL and LDL cholesterol levels
   - c. decrease triglyceride levels
   - d. increase total cholesterol and decrease triglyceride levels
   - e. none of the above

7. The polyphenol with a chemical structure similar to estradiol, a form of estrogen, is:
   - a. flavonoid
   - b. quercetin
   - c. resveratrol
   - d. enterodiol
   - e. catechin

8. A preliminary study found that risk of developing dementia was:
   - a. highest in heavy drinkers
   - b. decreased in moderate drinkers
   - c. lowest in abstainers
   - d. not affected by alcohol intake
   - e. none of the above

9. Preliminary studies have found that moderate wine intake:
   - a. Enhances or improves lung function
   - b. Enhances lung capacity
   - c. Suppresses lung diseases like COPD and emphysema
   - d. All of the above
   - e. Has no effect on lung function or lung diseases

10. Resveratrol appears to:
    - a. Inhibit the growth of nonmelanoma skin cancer
    - b. Act as an estrogen agonist
    - c. Act as an estrogen antagonist
    - d. None of the above
    - e. All of the above

11. In comparison to abstainers and heavy drinkers, moderate wine drinkers typically:
    - a. eat a healthier diet including fruits and vegetables
    - b. have a lower body mass index
    - c. exercise regularly
    - d. all of the above
    - e. consume a higher fat diet and exercise less

12. Risk of hypertension is:
    - a. increased with intake of just one drink per day
    - b. increased with the intake of two or more alcoholic drinks per day
    - c. decreased with the intake of two or more alcoholic drinks per day
    - d. decreased in women, but not men, who drink two or more glasses of wine daily
    - e. not affected by alcoholic intake

13. Excessive or heavy alcohol intake is associated with:
    - a. increased risk of stroke
    - b. certain cancers
    - c. liver diseases
    - d. alcohol addiction
    - e. all of the above

14. It is recommended to:
    - a. drink 6 to 8 ounces of wine before bedtime
    - b. consume 1 to 2 glasses of wine with meals
    - c. drink 1 to 2 glasses of wine one to two hours before eating
    - d. drink wine, rather than grape juice, to receive health benefits of polyphenols
    - e. none of the above

15. Phytochemicals:
    - a. are found predominately in plant foods
    - b. provide health benefits beyond normal nutrition
    - c. are non-nutritive substances
    - d. are physiologically active compounds
    - e. all of the above
CPE answer sheet for questions for Summer 2011 CPE: Is Wine a “Functional Food?”

Objectives, Learning Codes, and CPE questions for Summer 2011 CPE

This article is approved for 2.0 hours of continuing professional education by the Commission on Dietetic Registration. Possible Learning Codes: 2000, 2010, 2020, 4000, 4040, Level 2.

This activity has been approved for two hours of CPE credit. You will be notified if the hours are not approved[SHL2]. Please circle the letter that corresponds to the correct answer to the question.

1. a b c d e 9. a b c d e
2. a b c d e 10. a b c d e
3. a b c d e 11. a b c d e
4. a b c d e 12. a b c d e
5. a b c d e 13. a b c d e
6. a b c d e 14. a b c d e
7. a b c d e 15. a b c d e

Instructions for submission for credit:
1) After reading the article, answer the questions listed this page. For each question, select the one best response.

2) Mail, fax or email the application for CPE credit with answers to DIFM DPG c/o Shari Pollack, CPE Editor.

4500 Keeney Street
Skokie, IL 60076
sbethp@gmail.com
877-862-8390 FAX

3) Once this information has been received, your certification of completion will be sent. Keep the CPE credit along with the Certificate of Completion for your records.

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CPE Reporting Form • Summer 2011 • Is Wine a Functional Food?

Expiration Date 1-31-13
Please print or type

Name: __________________________________________

Address: __________________________________________

ADA Membership #: ___________________________ Phone: ___________________________

Email Address: __________________________________________

DIFM Member Yes _____ No_____

Date Test Completed: ___________________________

This activity had been approved for two hours of CPE credit. You will be notified if hours have not been approved.
Forks Over Knives

Ted D. Barnett, MD  Carol H. Barnett, PhD, JD

“Forks Over Knives,” as its filmmaker Lee Fulkerson likes to say, might just save your life. The film profiles two prominent men in the worlds of medicine and nutrition science who pioneered the art of curing disease with diet. T. Colin Campbell, Ph.D., a Cornell professor emeritus of nutritional biochemistry, conducted the China study, the most comprehensive epidemiological survey of diet in history. Caldwell Esselstyn, MD, a breast cancer surgeon at the Cleveland Clinic, grew weary of treating the end products of disease in heart patients. Both scientists, born and bred on dairy farms in the nation’s heartland, separately concluded that the typical American meat- and dairy-based diet is the major cause of typical American diseases: cancer, diabetes, and heart disease.

Campbell and Esselstyn are joined on the screen by a host of other experts who endorse a plant-based diet as the ticket to health: psychologist Doug Lisle, Ph.D., and physicians John McDougall, MD, and Terry Mason, MD, among others. The film’s most moving and impressive scenes involve everyday patients, mired in illness, and the health professionals they consult. With nine daily pills, two daily shots and many extra pounds, Joey Aucoin of Florida was almost a dead man walking. Relying on the support of his doctor, Joey was able to embrace a plant-based diet. He dropped the pills, the shots, the weight, and—as his wife says—he will never go back.

“Forks Over Knives” will open your eyes to a new reality: Meat and dairy products are neither necessary nor healthful for you and your patients. Moving them off the plate may save our lives. This film is based on solid science that is slowly making its way into the mainstream as evidenced by the latest USDA dietary guidelines. The new MyPlate guide recommends that your plate be at least 3/4 or, optionally, completely plant-based.

Ted D. Barnett, MD, is a board-certified Diagnostic and Interventional Radiologist who practices in Rochester, New York. He and his wife, Carol H. Barnett, PhD, JD, have been vegan for more than 20 years and have raised three healthy vegan children who are now aged 18, 22, and 24. Contact Dr. Barnett at drveggie@aol.com and Carol H. Barnett at mrsvegan@aol.com.

Amie Hamlin is the Executive Director of the New York Coalition for Healthy School Food who has been vegan for more than 22 years and has a healthy 9-year-old vegan daughter. Contact Amie at amie@healthyschoolfood.org.

What DIFM members have said about Forks Over Knives

A wonderful exploration on the healing power of plant based foods in the fight against chronic disease. While I would have liked more emphasis on healthy fats as well as some education on the different nutritional profiles of factory farmed animals vs grass fed/free range animals, the movie was an inspiration and can be used as a great “starter kit” for getting patients to eat a more vibrant, fiber rich and nutrient dense diet. Mary, MS, RD - Seattle

(The) Only thing is that it is not really clear from the documentary what they mean by a “whole foods” plant based diet. For all the viewer knows, that translates into mac and cheese with iceberg lettuce salad for dinner. That aside, it was a very convincing documentary that I think will make people think twice about their eating habits. Sheila, DSc, RD, LDN, CCN, CDE - Florida.

Forks Over Knives makes a strong case for adopting a plant-based whole foods diet to prevent disease and achieve optimal health. But more importantly, in juxtaposing what many see as an “extreme” way of eating with the extreme realities of surgery, the film offers a powerful reality check for those who would continue to eat a standard American diet because making a change seems too daunting. Shari, MPH, RD - Illinois
Consider this: The DNA from your 25,000 genes is wrapped around histone proteins supercoiled into nucleosomes; and further supercoiled into the chromatin which comprises the 46 chromosomes in each cell of your body. It is so tightly packaged; it is like vacuum packed clothing. How do your cells access all of this powerful genetic information to generate the proteins necessary to run your body’s machinery? It turns out your genes are turned on and off by methylation, acetylation, phosphorylation, biotinylation, ubiquitination, sumoylation, and ADP-ribosylation. These control mechanisms are fueled by the food you eat and the nutrition supplements you choose. For example, B-12, methionine, choline and betaine are known methyl donors to DNA and histones; while tea polyphenols, genistein, and isothiocyanates have been shown to reduce DNA hypermethylation associated with cancer development.¹ Research shows this interaction between our genes and environment can become semi-permanent and heritable.²,³ This is the exciting science of epigenetics!

The following mechanisms are epigenetic examples. Methyl groups bind to CPG islands located on promoter regions (the control center) of genes. The attachment of a methyl group to a gene’s promoter region “turns off” a gene’s ability to be transcribed and translated, i.e. expressed. Un-methylated CPG islands allow genes to be expressed, or “turned on.”⁴ A variation in the Methyleneetetrahydrofolate Reductase (MTHFR) gene, -677 C>T, affects the body’s ability to metabolize folate, which impacts the ability for folate to donate methyl groups. In the case of the development of cancer, the body hyper-methylates tumor suppressor genes, so they are “turned off”, and hypo-methylates tumor promoter genes, so they are “turned on”. Therefore, it should come as no surprise that there is an association between the -677C>T MTHFR gene variation and cancer risk.⁵

The modification of histones through acetylation and deacetylation presents another example of gene regulation under epistatic control. Several enzymes are involved in the transfer of acetyl groups to histones. An acetylated histone creates a euchromatic, or open state; allowing for gene expression. A deacetylated histone creates a heterochromatic, or closed, state; resulting in gene silencing. An imbalance in the enzymes involved in histone acetylation is seen in the development of cancer.⁶

Maternal food and nutrient intake and other environmental exposures have an epigenetic influence on the health trajectories of offspring. The agouti mice experiments have shown us the effect of maternal intake of toxins (bisphenyl-A) and continuous, overexpression of the agouti gene result in offspring with a high susceptibility to developing obesity and diabetes. The research has also shown us methyl donating nutrients can reverse this imprinting effect of maternal toxins to produce offspring with a greater chance for longevity.⁷ Thus, epigenetics demonstrates good nutrition can reverse the negative health effects of toxic environmental insults!

While epigenetic health effects are difficult to study in humans, epidemiological research can give us some clues. Kaati and colleagues have demonstrated a transgenerational effect of early nutrition. In his research on individuals growing up in Norbotten, Sweden in the early 1900s, he and his colleagues have shown a relationship between the amount of food available to children, chronic disease, and the longevity of their offspring. In males there is a transgenerational response linking paternal grandparental diet to transgenerational, male mortality. For example, boys exposed to overabundant harvests were more likely to produce sons and grandsons that developed diabetes and cardiovascular disease, thereby living shorter lives. Girls exposed to overabundant harvests were more likely to produce daughters and grand-daughters that lived shorter lives.³ This sex-specific, transgenerational effect implies sex-chromosome-specific genetic imprinting. Thus, an epigenetic mechanism of inheritance is the most reasonable explanation.

In later work, Pembrey and his colleagues’ research demonstrates sons of fathers that smoked before age 11 years in Bristol, England, had larger BMIs by the age of 9 years. The same effect was not seen in the daughters, however.⁶ Unfortunately the mechanism for the association between smoking and BMI has not been elucidated in published research. Interestingly enough, prenatal exposure to maternal smoking is also associated with a higher ratio of DNA methylation in the Brain Derived Neurotrophic Factor (BDNF) gene.⁷ When methylated, BDNF reduces gene expression. Perhaps, there is a downstream effect of altered serotonin metabolism.⁸ So we have direct evidence of an epigenetic effect caused by smoking. Perhaps, there is a downstream effect of altered serotonin metabolism on energy intake and energy metabolism or fat deposition? We do not know, as yet; and neither do we understand the other genes affected by smoking which produce a tendency towards excess body weight.

Our genes are turned on and off in relation to our diet and environment; and the dis-regulation of tumor promoter and suppressor genes provides a well-researched example. Undoubtedly, early human diet and a toxic environment affect the womb. It is likely an epigenetic change in gene expression, such that obesity promoting genes are turned on and longevity promoting genes are turned off.
“SNiP” Update: The Epigenetics of Nutrition

are turned off. However, stay tuned for more on this as the human epigenetic landscape continues to unravel.

Colleen Fogarty Draper, MS, RD, LDN is the Nutritional Genomics Advisor, DIFM DPG. Contact Colleen at Fax: 781-287-1068 or colleen@nugenso.com.

References

DIFM Publishes Standards of Practice and Standards of Professional Performance for RDs and Unveils the ‘IFMNT Radial’

Robin Foroutan, RD, HHC

H old on to your Journal this June, because we’ve got some big DIFM news to share! After much time and effort on the part of your DIFM Executive Committee, the “Standards of Practice and Standards of Professional Performance (SOP/SOPP) for Registered Dietitians (RD) in Integrative and Functional Medicine” has been published. You’ll find the article in the June 2011 issue of the Journal of the American Dietetic Association with a link to the electronic version that includes figures 1–3. (You may access the document at www.eatright.org/sop). The working group members were: Deborah Ford, MS, RD; Sudha Raj, PhD, RD, CDN; Rita Kashi Batheja, MS, RD, CDN; Ruth DeBusk, PhD, RD, LDN; Dave Grotto, RD, LDN; Diana Noland, MPH, RD; Elizabeth Redmond, PhD, MMSc, RD, LD; Kathie Madonna Swift, MS, RD, LDN. The publication of this document marks the first official delineation of standards and core competencies for nutritional therapies specific to Integrative and Functional Medicine.

As we can all attest, Integrative and Functional Medical Nutrition Therapy (IFMNT) is extremely broad in scope and definition, but can be summarized as a patient-centered medical model that incorporates the best of conventional medicine with effective, evidence-based practices of complementary and alternative medicine. The SOP addresses the Nutrition Care Process and activities related to person-centered care, while the SOPP are authoritative statements that describe a competent level of behavior in the professional role.

The center-point of the SOP is the IFMNT Radial, established as an integrated conceptual framework to assist in IFMNT practice. The circular architecture of the IFMNT Radial allows for the evaluation of complex interactions and interrelationships. It depicts food as a determining factor in health and disease, and as a source of biological information that influences, and is influenced by, five key areas. The five key areas are: lifestyle, systems (signs and symptoms), core imbalances, metabolic pathways, and biomarkers. Surrounding the Radial are important triggering factors that can affect the individual.

“The RD’s role in Integrative and Functional Medicine is of central importance, as the foundation of this medical model is rooted in using ‘food as medicine’ and combining nutritional therapies with lifestyle choices to address the underlying causes of disease,” says Deb Ford, MS, RD, CCN, DIFM Past-Chair. “These SOP/SOPP guidelines are a landmark step in further defining what an Integrative and Functional Medicine RD should know.”

DIFM’s development of professional standards for dietetic practitioners within the Integrative and Functional Medicine field will serve several purposes: 1) offer a set of core competencies and clearly defined levels of proficiency for those practicing IFMNT; 2) provide guidance to allied Integrative and Functional Medicine professionals in assessing the level of competency in those practicing IFMNT; 3) provide professional development guidance for RDs seeking to practice IFMNT or for those seeking to further their expertise in IFMNT.

In summary, these SOP/SOPP will separate true IFMNT practitioners from those without the specialized training, help us define ourselves as integrative and functional medicine practitioners, and guide our professional development. It’s a major development in the field of IFMNT and we’re very pleased to share this great news!

The article can be accessed at: http://www.adajournal.org/article/S0002-8223(11)00477-9/abstract.

Robin Foroutan, RD, HHC is 2011-2012 Communications chair. Contact Robin at 212-677-7218 or rforoutan@mac.com.

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www.integrativeRD.org
Understanding Functional Foods Through the Eyes of Consumers

Wendy Reinhardt Kapsak, MS, RD
Elizabeth Rahavi, RD
Christa Eimers, Dietetic Intern

INTRODUCTION

New evidence and its related understanding by both health professionals and researchers about the role of diet in the overall health status of Americans have developed over the past decades. Such evidence has resulted in a heightened public interest in learning about foods that can provide benefits beyond basic nutrition or “functional foods.” In fact, 84% of consumers have cited interest in learning more about foods that can provide benefits.1

Functional foods include a wide variety of foods and food components believed to improve overall health and well-being, reduce the risk of specific diseases, or minimize the effects of other health concerns. Such functional foods can include the inherently healthful components in fruits and vegetables; whole grains and fiber in certain cereals and breads and calcium in milk; fortified foods and beverages, such as vitamin D–fortified milk; and, in its broadest definition, dietary supplements also. This definition of functional foods is similar to the one used by the American Dietetic Association.2

Since 1998, the International Food and Information Council (IFIC) has conducted consumer insight surveys related to functional foods every 2 to 3 years. These surveys provide insights into consumer interests and perceptions about foods and beverages and their roles in promoting health and wellness. In 2009, IFIC commissioned its sixth consumer insight survey studying Americans’ attitudes and awareness toward functional foods. Over a 10-day period, 1,005 U.S. adults were randomly invited to participate in a 20-minute Web-based survey. Respondents were invited based on gender, education, age and ethnicity to include a representative sample of the American population; the final data set was weighted by level of education.

CONSUMER PERCEPTIONS OF FUNCTIONAL FOODS

The results of IFIC’s 2009 Functional Foods/Foods for Health Survey indicate that most consumers are aware of functional foods. For the past 5 years, about nine of 10 Americans have been able to name, on an unaided basis, a specific food or food component and its associated health benefit. The top functional foods named by consumers include fruits and vegetables; fish/fish oil/seafood; dairy (including milk and yogurt); meat and poultry; herbs and spices; fiber; tea and green tea; nuts; whole grains and other grains; water; cereal; oats/oat bran/oatmeal; and vitamins/supplements.

When asked about health benefits associated with the aforementioned food or food components, most Americans reported improvements in or lowering of risk of cardiovascular disease, digestive health, risk of vitamin deficiencies, general health, bone health, risk of cancer, eye health, immune health, and weight maintenance.

Consumer acceptance of functional foods is positive. Most Americans (89%) agree that certain foods have additional benefits and may reduce the risk of disease. Consumers most likely to agree with the notion that some foods have benefits beyond basic nutrition are those who report having an “excellent” health status, use dietary supplements, have a college education, and those who are single.

When asked whether they agree or disagree that foods and beverages can provide a wide array of specific health benefits (for example, heart health), between 68% and 85% of Americans either “somewhat” or “strongly believe” in the stated benefit. Americans believe the top benefits of foods and beverages include:

- improved heart health (85%)
- healthy growth and development of children (83%)
- improved physical energy or stamina (82%)
- overall health and wellness (82%)
- improved bone health (82%)

Americans’ consumption of functional foods parallels their awareness of food and health associations. When prompted about a certain food or food component and a corresponding health benefit, consumers report they are already consuming specific foods related to some of their top health concerns, including cardiovascular disease, cancer, and weight, or foods associated with certain diet and health relationships such as calcium and bone health or fiber and digestive health. Between 25% and 60% of Americans say they are already consuming specific foods and beverages for specific health benefits while 35% to 50% say they are likely to begin consuming foods for the indicated benefit.

Additional findings from the 2009 Food & Health Survey: Consumer Attitudes Toward Food, Nutrition, and Health by the IFIC Foundation show that the top three food components that consumers aged 18 years and older look for when choosing foods and beverages included fiber, whole grains and protein. However, when choosing food and beverages for their children, calcium, vitamin C and whole grains were thought to be the most important components.3

FUNCTIONAL COMPONENTS PERTINENT TO DIABETES

Several food components may confer benefits in minimizing the effects of diabetes-related conditions. While not all-inclusive, the Table provides a starting point for the scientifically backed benefits of certain functional components relevant to diabetes, along with examples of food sources that contain these beneficial components.4
### Table. Examples of Functional Components Pertinent to Diabetes*

<table>
<thead>
<tr>
<th>Class/Components</th>
<th>Source</th>
<th>Potential Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietary (functional and total) fiber†</td>
<td>Oat bran, oatmeal, oat flour, barley, rye</td>
<td>May reduce risk of CHD; may contribute to maintenance of healthy blood glucose levels</td>
</tr>
<tr>
<td>Soluble fiber</td>
<td>Psyllium seed husk, peas, beans, apples, citrus fruit</td>
<td>May reduce risk of CHD and some types of cancer; may contribute to maintenance of healthy blood glucose levels</td>
</tr>
<tr>
<td>Whole grains</td>
<td>Cereal grains, whole wheat bread, oatmeal, brown rice</td>
<td>May reduce risk of CHD and some types of cancer; may contribute to maintenance of healthy blood glucose levels</td>
</tr>
<tr>
<td><strong>Fatty acids</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MUFAs†</td>
<td>Tree nuts, olive oil, canola oil</td>
<td>May reduce risk of CHD</td>
</tr>
<tr>
<td>PUFAs: ALA (omega-3 fatty acid)</td>
<td>Walnuts, flax</td>
<td>May contribute to maintenance of heart health; may contribute to maintenance of mental and visual function</td>
</tr>
<tr>
<td>PUFAs: DHA/EPA (omega-3 fatty acid)†</td>
<td>Salmon, tuna, marine, and other fish oils</td>
<td>May reduce risk of CHD; may contribute to maintenance of mental and visual function</td>
</tr>
<tr>
<td>Conjugated linoleic acid</td>
<td>Beef and lamb; some cheese</td>
<td>May contribute to maintenance of desirable body composition and healthy immune function</td>
</tr>
<tr>
<td><strong>Flavonoids</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flavanols: Catechins, epicatechins, epigallocatechin, procyanidins</td>
<td>Tea, cocoa, chocolate, apples, grapes</td>
<td>May contribute to maintenance of heart health</td>
</tr>
<tr>
<td>Proanthocyanidins</td>
<td>Cranberries, cocoa, apples, strawberries, grapes, wine, peanuts, cinnamon</td>
<td>May contribute to maintenance of urinary tract health and heart health</td>
</tr>
<tr>
<td>Minerals: Potassium†</td>
<td>Potatoes, low-fat dairy products, whole grain breads and cereals, citrus juices, beans, bananas</td>
<td>May reduce the risk of high blood pressure and stroke, in combination with a low-sodium diet</td>
</tr>
<tr>
<td>Phenolic acids: Caffeic acid, ferulic acid</td>
<td>Apples, pears, citrus fruits, some vegetables, coffee</td>
<td>May bolster cellular antioxidant defenses; may contribute to maintenance of healthy vision and heart health</td>
</tr>
<tr>
<td><strong>Plant sterols/sterols</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free sterols/sterols†</td>
<td>Corn, soy, wheat, wood oils, fortified foods and beverages</td>
<td>May reduce risk of CHD</td>
</tr>
<tr>
<td>Stanol/sterol esters†</td>
<td>Fortified table spreads, stanol sterol dietary supplements</td>
<td>May reduce risk of CHD</td>
</tr>
<tr>
<td>Phytoestrogens: Lignans</td>
<td>Flax, rye, some vegetables</td>
<td>May contribute to maintenance of heart health and healthy immune function</td>
</tr>
<tr>
<td>Soy protein†</td>
<td>Soybeans and soy-based foods</td>
<td>May reduce risk of CHD</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>Sunflower seeds, almonds, hazelnuts, turnip greens</td>
<td>Neutralizes free radicals, which may damage cells; may contribute to healthy immune function and maintenance of heart health</td>
</tr>
</tbody>
</table>

* Not an all-inclusive list. † U.S. Food and Drug Administration–approved health claim established for component.
REMAINING A TRUSTED SOURCE FOR FOODS THAT CAN PROVIDE BENEFITS

As consumers live longer and grow more interested in reducing their risk of chronic disease, the demand for information about foods that can provide health benefits increases. Though 70% of Americans rank mass media as their top source of health and nutrition information, only 27% of these consumers consider the media to be believable. Further, when consumers are asked who would influence them to try a specific food or food component, the vast majority of them cite health professionals in general (84%), and dietitians specifically (71%) as sources that would influence them to either a “moderate” or “great” extent.1

While the media can often sensationalize information about diet and health, presenting new products as “magic bullets,” health professionals are the conduit between science and consumers, deciphering health messages for them using science-based information and practical advice. Accordingly, health professionals play an integral role in helping consumers incorporate healthful foods and food components into their diet. However, new evidence will continue to emerge in this area, so it is important for health professionals to monitor the science as well as consumer knowledge and acceptance of these foods, and lend expertise to nutrition communications that guide consumers toward better health.

SUMMARY

Most Americans are interested in foods and beverages that can provide a host of benefits from improving overall health and wellness to improving heart, bone and digestive health to maintaining healthful weight. Many Americans report consuming foods for a specified health benefit, and even more are interested in doing so.2 Consumers are primed for actionable advice about foods that provide benefits and ways in which to incorporate these foods into their diet. While some food and health relationships may not be on the top of consumers’ minds at this time, continued exposure to particular foods and beverages with beneficial components can heighten awareness and result in increased consumption over time.

Functional foods are an important part of an overall healthful lifestyle that includes a balanced diet and physical activity. Consumers should strive to incorporate a wide variety of foods, including many of the examples listed herein, into their diet (Figure). These examples are not “magic bullets.” The best advice at this time is to include a variety of foods, as exemplified in the U.S. Department of Agriculture’s food plan, which would provide many potentially beneficial components into consumers’ diets.

Wendy Reinhardt Kapsak, MS, RD is Senior Director, Health and Wellness with the International Food Information Council Foundation, Washington, D.C.

Elizabeth Rahavi, RD is Associate Director, Health and Wellness with the International Food Information Council Foundation, Washington, D.C.

Christa Eimers is a Dietetic Intern, St. Louis Department of Veterans Affairs Medical Center, St. Louis, Missouri.


REFERENCES


Top “Functional Foods” Named by Consumers

- fruits and vegetables
- fish/fish oil/seafood
- dairy (including milk and yogurt)
- meat and poultry
- herbs/spices
- fiber
- tea and green tea
- nuts
- whole grains and other grains
- water
- cereal
- oats/oat bran/oatmeal
- vitamins/supplements

What is the (first/second/third) food or food component that comes to mind that is thought to have health benefits beyond basic nutrition? (n=1005)
Come Join me at FNCE!

You’re invited to attend the 2011 ADA Food & Nutrition Conference & Expo, September 24 – 27 in San Diego, California. Don’t miss this chance to truly IMPACT your career by earning CPEs, making key business connections and discovering emerging trends and innovations.

I look forward to seeing you in San Diego!

Here is a preview of what to expect:

• Enhance your learning with cutting-edge educational sessions covering at least eight tracks allowing you to earn a MINIMUM of 20 CPE hours.

• Make plans to attend the Research Symposium on Monday where you will gain an insight into the research and strategic topics related to the dietetics profession.

• Discover new and emerging trends and innovations while walking the Expo floor and meeting with over 300 exhibitors.

• Attend the Culture Symposium on Tuesday where you will be able to expand your cultural horizons.

• Be amazed and inspired by our line-up of key note sessions on the power of volunteerism, passion for a cause and how to achieve personal and professional success.

• Above all, network with over 6,000 of your peers!

Visit [www.eatright.org/fnce](http://www.eatright.org/fnce) to learn more. Registration opens May 16, 2011.
Welcome to the new membership year for DIFM! This will be an exciting, yet challenging year, for our group. This year we are set out to “exceed expectations” in many ways. Your Executive Committee has been expanded to include many new Associate positions, which has enabled us to not only involve many more members, but will help us develop the future leaders of DIFM. If you are interested in serving in any way, large or small, please contact me! We have a place for you.

The recent publication of Standards of Practice (SOP) and Standards of Professional Performance (SOPP) for Dietitians in Integrative and Functional Medicine published in the Journal of the American Dietetic Association in June 2011 provided the foundation for the potential of a future “Board Certified Specialist” in this emerging area. (You may access the document at www.eatright.org/sop.) Our Credentialing Task Force, led by Lisa Dorfman, MS, RD, CSSD, LMHC, and Mary Beth Augustine, RD, CDN, is working diligently on the application process.

Our intent is that every educational opportunity this year—the Pre-FNCE Workshop, webinars, newsletter articles—will be focused on providing you with the core education required for the foundational knowledge to prepare you for this credential. This important step can not only change your professional career, but change your own health! We intend to exceed expectations by offering cutting-edge, exciting opportunities to learn or expand your knowledge of integrative and functional nutrition practice.

We know that this area of practice is key to the future of healthcare and medicine in our future. Change is happening all around us, it is the new norm. How we adapt to this change will be the key to our survival, especially as a profession. If we want to impact the change, it takes a conscious decision! Get out of your comfort zone. Visualize the next step. Observe others who are creating the practice, or success, you desire. Then, take action!


Sometimes, sacrifice. Together, we are a greater force than just the sum of our parts. We can impact our profession in a lasting way, leading the way. Join in the charge, and help DIFM exceed expectations for “what one group can do”.

Join us at the Pre-FNCE Workshop in San Diego on September 24! See the “in this issue” for information and registration details. Also, please RSVP for the Member Breakfast on Monday September 26. We look forward to meeting you there!
WELCOME! Let’s come together and get to work!

Monique Richard
Dietetic Intern
Eastern Tennessee State University
DIFM Student Committee Chair
American Overseas Dietetic Association (AODA) - Student Outreach Chair

Calling all dietetic students and interns!!! Are you ready to make this the year you broaden your horizons, expand your networks, and make strides in your path in dietetics? You have come to the right place. I welcome and invite you to participate in any way you can in DIFM or ADA. As students, we are privy to the most spectacular opportunities that lend themselves to helping us to develop into better professionals. Registered Dietitians already in the workforce do not get the membership breaks we receive for being a student as part of ADA, DPGs, or when attending the Food & Nutrition Conference & Expo (FNCE). Now is the time to take advantage of these opportunities!

Our generation is connected by Twitter, Facebook, texting, IMing, emailing, Skyping and blogging, so why not seize the opportunity to connect and do something more with these resources—together? It is time to come together as students to learn and to teach. Teach others about our resourcefulness; we may be limited in our budgets, but we are savvy about eating and living well, about integrity and passion, and about the discipline we hold so dearly to our hearts. We are the driving force for change and the pillars of strength and continuity that the field of dietetics needs to make a difference all over the world. The working and retired RDs and professionals that comprise ADA have worked tirelessly, paving a better path for others to follow; it is our responsibility to do the same.

Today is the day I challenge you to call or email that mentor you have been wanting to shadow, write the educational article (for our newsletter, maybe?), read that book on integrative and functional medicine, question a persons or business is perspective, volunteer for a food pantry, school, or church function. Whatever it is—make it happen, share it, learn from it, and appreciate all the opportunities we have and create more.

As the Student Committee Chair, I want to invite all of you to be active in DIFM. There is so much we can do—large or small—it all helps. Please contact me if you are interested in participating. Students can get their foot in the door by reviewing books and/or authoring articles; by participating in booths at FNCE or state events; or by becoming a subcommittee member, or a public relations or networking volunteer. You can host an event in your area, share about something going on, or recruit other students to be involved. Let’s do it!

To find out more information or to volunteer, email Monique at mmr2v@mtmail.mtsu.edu.

Also, please see below for a Student Stipend lottery for FNCE:

ADA Foundation FNCE 2011 Student Stipends

The 2011 ADA Foundation Food & Nutrition Conference & Expo (FNCE) Student Stipend Challenge is a wonderful way to get dietetics students involved and excited about the future of dietetics professionals. The Student Stipend Challenge allows ADA to award dietetics students, who are ADA members, a $100 stipend towards their FNCE expenses. The program works as a lottery in which student members who are registered to attend FNCE are randomly selected and paired up with a donor.

Donors who make a minimum $100 contribution will be matched with a specific student; this will provide an opportunity to introduce your DPG/MIG, and in our case DIFM, to future food and nutrition professionals.

Recently Updated!
Disorders of Lipid Metabolism Evidence-Based Nutrition Practice Guideline FREE to all ADA Members

You will find nutrition recommendations within this guideline related to individuals with Disorders of Lipid Metabolism which include the following topics, among many others:

- Medical nutrition therapy and nutrition assessment, monitoring and evaluation
- Cardio Protective Diet (e.g., Omega-3 Fatty Acids, Plant Sterols and Sterols)
- Micronutrient Intervention (e.g., Antioxidant Supplementation, Homocysteine, Folate, Coenzyme Q10)
- Behavior/Physical Activity

To access visit www.eatright.org, sign-in and select the Evidence Analysis Library link on left. Select “Guidelines” and click on “Nutrition Guideline List”.

Summer 2011 Volume 13, Issue 1
www.integrativeRD.org
Summer is upon us and, in some locals, with a vengeance. The Southwestern Desert has not been as hot as in recent past and this respite is welcome. Never-the-less, we must all remind ourselves, family, friends, and clients to drink plenty of water to stave off dehydration. It is a good time for all of us who are suffering from the summer heat and, in some cases, humidity, to find our refuge inside where we can read all of those articles we have been planning on getting to since winter. It is also a good time to begin thinking ahead about the opportunity to become a credentialed Dietitian in Integrative and Functional Medicine and how those unread articles and journals may help us prepare for this step forward.

The Summer Newsletter Supplement and this e-version are providing you with an introduction to what is coming—and is it ever exciting! The Food & Nutrition Conference & Expo (FNCE) in San Diego is right around the corner. Not only does DIFM have some exciting programs planned, but there are also plenty of other opportunities to learn about subjects that will advance our knowledge in integrative and functional medicine. The pre-FNCE workshop will provide members with the first taste of what is in store with our credentialing program by introducing the Radial. For more information, refer to the summer supplement for a feature article on the topic.

I would like to take this opportunity to welcome Jacqueline Santora Zimmerman, MS, RD as Associate Newsletter Editor. With the help of Jacqueline; our Copy Editor Emily Moore, RD, LDN; CPE Editor Shari Pollack, MPH, RD; and Communications Chair Robin Foroutan, RD, HCC, we have many positive changes in store for the newsletter in the coming year. If any of you, as DIFM members, are willing and able to provide an article, review a book, or just give us positive feedback, we welcome you to do so. Email me at peaknut@cascadeaccess.com or any of the other newsletter team members; their contact information may be found in the DIFM Leadership list.

I look forward to seeing many of you at FNCE this year. I encourage you to plan on attending the career changing pre-FNCE DIFM workshop as well.

Those of you who would like to contribute an article or have topics that you would like to see in future issues, please feel free to drop me an email or give me a call – peaknut@cascadeaccess.com or 702-346-7968 – or contact any one of the capable DIFM leaders listed on the back of the newsletter.
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An increasing number of patients are seeking complementary and alternative therapies for health and healing and it is expected that the demand for integrative clinicians will grow significantly. This workshop will review a new framework for 21st century practice and demonstrate how the nutrition care process is utilized within an integrative and functional medicine model. The workshop speakers will include both didactic and experiential components in their lectures, including the key aspects of an integrative nutrition assessment and a nutrition-focused physical exam. The participant will expand their nutrition toolkit, gain practical knowledge, and develop their skills to maintain a competitive edge.

Saturday, September 24, 2011 8AM to 3:30PM
San Diego Marriott Marquis and Marina
Marriott Hall, Salon 3
8:00-8:30AM: Registration, Visit Exhibits by Conference Sponsors

8:30-8:45AM: The Integrative and Functional Medicine Radial: A Framework for 21st Century Nutrition Practice and Resources for the Nutrition Practitioners Toolkit/Kathie Madonna Swift, MS, RD, LDN/Kathie Madonna Swift, MS, RD, LDN is a leading educator and practitioner who was recently named by “Today’s Dietitian” as one of the top Registered Dietitians in the country who are “making a difference”. She has an integrative and functional nutrition practice, SwiftNutrition.com, is a nutrition consultant for corporations and integrative medicine centers and she designs “Food as Medicine”, a premier professional nutrition training program.

8:45-9:45AM: Nutritional Triage: unifying aging theories to create potent health solutions James Doherty has over fifteen years of experience in the natural products industry and heads up the professional division of Innate Response Formulas. He has lectured on the complex science of whole food nutrition throughout the country and in Canada.

9:45-11:15AM: Integrative Nutritional Assessment: Chronic Disease, Core Imbalances and the Nutritional Terrain/Diana Noland, MS, RD, CCN/Diana Noland, RD, MPH, CCN, is a successful private practitioner in Southern California with 30+ years of experience in Clinical Dietetics using an integrative and functional nutrition approach. She was a committee member for the development of the Standards of Practice, and the recipient of the 2010 DIFM “Excellence in Clinical Practice” Award.

11:15-12:15PM: Lunch, Visit Exhibits by Conference Sponsors

12:15-1:15PM: The Integrative Nutrition Focused Physical/Michael Stone, MD, MS/Michael Stone, MD, MS, is a family physician who is interested in changing lives through changing the face of medicine. He is a functional medicine physician who looks at patient’s problems through the lens of improving function. He received his MD from the University of Washington, Seattle, WA, and both a BS and a MS in Nutrition from Washington State University, Pullman, WA, graduating with Honors.

1:15-2:15PM: Adverse Food Reactions: Food Allergies and Intolerances/James W. Wright, DO/James W. Wright, DO, is an enterprising, skilled, compassionate medical expert and entrepreneur who lives the philosophy of life change through wellness. Backed by solid credentials as a Master’s prepared, Fellowship trained and double board certified physician specializing in Anti-Aging, Regenerative, and Functional Medicine.

2:15-2:45PM: Break, Visit Exhibits by Conference Sponsors

2:45-3:30PM: The Path Ahead: Resources for the Nutrition Practitioners Toolkit Kathie Swift MS RD LDN

2011 Integrative and Functional Medicine PreFNCE Workshop Integrative Nutrition: Essential Tools for Practice

...Building Your Future Now

RESERVE YOUR SEAT AND REGISTER TODAY!
Saturday, September 24, 2011 8AM to 3:30PM
San Diego Marriott Marquis & Marina
2011 Integrative and Functional Medicine PreFNCE Workshop Program Agenda
Sponsored by Cell Science Systems-ALCAT and Innate Response Formulas

2011 Integrative and Functional Medicine PreFNCE Workshop

Integrative Nutrition: Essential Tools for Practice
...Building Your Future Now

RESERVE YOUR SEAT AND REGISTER TODAY!
Saturday, September 24, 2011 8:00AM to 3:30PM
San Diego Marriott Marquis & Marina

Registration fee: $99 for DIFM members ($129 after 9/14/11*) $129 for Non DIFM members ($159 after 9/14/11*)
All are welcome to attend. Providing 6 CEUs for RDs
*please indicate if you prefer a gluten free _____ or vegetarian _____ lunch

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Payments may be mailed to: American Dietetic Association P.O. Box 97215 Chicago, IL 60607
Credit card payments can also be faxed to ADA @ 312-899-5338 or Emailed to DPGAccounting@eatright.org
For more information visit our website: www.integrativerd.org or email us at info@integrativerd.org
* Lunch is not guaranteed if registration is received after 9/14/11 ** No refunds after 9/14/11