Utah State University

DigitalCommons@USU

Undergraduate Honors Capstone Projects | Honors Program

5-2007

Efficacy of Heart Health Claims Regarding Trans Fat, Unsaturated Fat, and Stanols/Sterols

Elaine Watkins
Utah State University

Follow this and additional works at: https://digitalcommons.usu.edu/honors

 Part of the Dietetics and Clinical Nutrition Commons

Recommended Citation

Watkins, Elaine, "Efficacy of Heart Health Claims Regarding Trans Fat, Unsaturated Fat, and Stanols/Sterols" (2007). *Undergraduate Honors Capstone Projects*. 684.
https://digitalcommons.usu.edu/honors/684

This Thesis is brought to you for free and open access by the Honors Program at DigitalCommons@USU. It has been accepted for inclusion in Undergraduate Honors Capstone Projects by an authorized administrator of DigitalCommons@USU. For more information, please contact digitalcommons@usu.edu.

EFFICACY OF HEART HEALTH CLAIMS REGARDING TRANS FAT, UNSATURATED FAT, AND STANOLS/STEROLS

by

Elaine Watkins

Thesis submitted in partial fulfillment of the requirements for the degree

of

DEPARTMENTAL HONORS

in

Nutrition Science with an emphasis in Coordinated Dietetics in the Department of Nutrition and Food Sciences

Approved:

Thesis/Project Advisor (Noreen Schvaneveldt)	**Departmental Honors Advisor** (Janet Anderson)

Director of Honors Program
(Christie L. Fox)

UTAH STATE UNIVERSITY
Logan, UT

Spring 2007

ABSTRACT

In the United States, nearly 80 million people have some form of cardiovascular disease (CVD). This amounts to one in three adults, making it the number one cause of death each year for over a century (1). Because of the high prevalence of CVD, it is a priority in the U.S. to decrease its morbidity and mortality. Extensive research has been dedicated to pinpointing risk factors, determining preventive techniques, and developing treatments. A major focus in this research is the role of nutrition in the pathogenesis of CVD. Quality of diet is an important factor in health and disease progression. To transfer this information to the general public, the Food and Drug Administration (FDA) has created labeling regulations and health claims to be used on food labels (2). The intent is to convey to the American public the positive or negative effects of the foods they choose to consume. Health claims are beneficial because they increase consumer awareness, encourage manufacturers to create healthier products, and recognize the work of researchers. But they can cause confusion and manufacturers often distort their meanings. The purpose of this thesis is to evaluate the efficacy of the health claims regarding trans fat, unsaturated fat, and plant stanols and sterols. It is important for dietitians to examine current research, scrutinize products, and convey this information to their clients. Understanding health claims, along with living a healthy lifestyle and having good dietary habits play a part in maximizing heart health.

Efficacy of Heart Health Claims Regarding Trans Fat, Unsaturated Fats, and Stanols/Sterols

Introduction

In the United States, nearly 80 million people have some form of cardiovascular disease (CVD). This amounts to one in three adults, making it the number one cause of death each year for over a century (1). Because of the high prevalence of CVD, it is a priority in the U.S. to decrease its morbidity and mortality. Extensive research has been dedicated to pinpointing risk factors, determining preventive techniques, and developing treatments. A major focus in this research is the role of nutrition in the pathogenesis of CVD. Quality of diet is an important factor in health and disease progression. To transfer this information to the general public, the Food and Drug Administration (FDA) has created labeling regulations and health claims to be used on food labels (2). The intent is to convey to the American public the positive or negative effects of the foods they choose to consume. The purpose of this thesis is to evaluate the efficacy of the health claims regarding trans fat, unsaturated fat, and plant stanols and sterols. Current research will be examined, recent events considered, and products scrutinized.

Health Claims

Different types of health claims have been developed by the FDA to serve a variety of needs in the food manufacturer and consumer world. These claims have specific requirements set by the FDA to ensure their validity and to standardize wording on labels (2,3). They are intended to assist the general public in making informed decisions and provide the most accurate information as possible. Although the intention

is good, there is still a great deal of confusion and discrepancy in the usage of health claims (4). This confusion among consumers is growing with more liberal use of the claims.

In 1997, the Food and Drug Administration Modernization Act was passed to allow other federal health agencies the authority of creating health claims as well as the FDA (5). The purpose of this act was to accelerate the process of approving claims. Authorized scientific bodies include the National Academy of Sciences, the National Institutes of Health, the Centers for Disease Control and Prevention, the Surgeon General within the Department of Health and Human Services, the Food and Nutrition Service, the Food Safety and Inspection Service, and the Agricultural Research Service within the Department of Agriculture (5). These organizations are qualified to determine the reliability of scientific studies and convey the information in the form of a health claim. There is a specific process that must take place through the FDA to ascertain that the claim is legitimate (3,5). This process has been liberalized a great deal under the Bush administration, expanding use of health claims in recent years.

A health claim identifies a relationship between a food and reducing the risk of a disease or health-related condition (3). These claims are subject to thorough FDA review and authorization in a lengthy process. The research is reviewed and evaluated for its soundness of design, appropriateness of conclusions, and consistency across a variety of studies (2,3).

To become endorsed, claims must meet significant scientific agreement (SSA). The standard of SSA is comprised of two components: that the entirety of public evidence supports the substance/disease relationship that is the subject of the claim, and

that there is SSA among qualified experts of its validity (2,3). The overall purpose of SSA is to determine if a change in the dietary intake of the substance will influence an alteration in a disease endpoint. There are fourteen claims that currently meet SSA, six of which concern heart disease (see table 1) (2).

All other health claims besides these fourteen that have SSA are considered "qualified" (2,3). Qualified health claims are used when there is emerging evidence for a legitimate health claim. The conclusions are not established well enough to meet the SSA standard, but there is potential for it to be authorized after further research substantiates the claim. The wording on the label must state that the evidence is not conclusive, or that the evidence supporting the claim is limited (2).

Trans Fat

Trans fats are controversial in the world today due to the latest research concerning their safety. On January 1, 2006, legislation went into effect stating that trans fat is required to be listed separately on the Nutrition Facts Label (2). It must be included under the Total Fat section on the label and be shown in grams. If there is less than 0.5 grams of trans fat per serving, it can be listed as zero (2). This part of the regulation is a major loophole that countless manufacturers take advantage of. In some cases, serving sizes have been adjusted so they can claim that there are zero grams of trans fat in the product. Portions are also distorted up or down compared to the standard serving size. This can be greatly misleading to consumers who are unaware of these details.

Only a few months ago the FDA officially recognized the harmful effects of trans fat in the approved heart health claim (2). The health claim regarding saturated fat and

cholesterol related to heart disease was changed on November 15, 2006 to read, "High intake of saturated fats, *trans* fats, and cholesterol increases the risk of unhealthy blood lipid levels, which, in turn, may increase the risk of coronary heart disease. Consume less than 10 percent of calories from saturated fatty acids and less than 300 mg/day of cholesterol, and keep *trans* fatty acid consumption as low as possible" (2). Because this occurred so recently, consumers may not be fully aware of exactly what trans fat is, what foods it is found in, and how it affects the human body.

A variety of prospective epidemiological studies have indicated a relationship between trans fat and the risk of coronary heart disease. Using data from the Nurses' Health Study, the Harvard School of Public Health examined the association of trans fat intake and CHD risk among women under age 65 (6). Food frequency questionnaires of 78,778 women were used over a 20 year period to gain information regarding fat consumption, types of fat utilized in food preparation, and fasting serum triglyceride levels (6). This data was correlated with nonfatal and fatal myocardial infarctions that occurred later in life. It was determined that *trans*-fat intake was significantly positively associated with increased risk of CHD (6). The Zutphen Elderly Study conducted in 2001 concluded a similar relationship (7). Researchers hypothesized that trans fat contributes to a higher incidence of CHD due to its harmful influence on serum blood lipid levels. It increases low density lipoprotein (LDL) cholesterol and total cholesterol while lowering high density lipoprotein (HDL) cholesterol (7). Furthermore, trans fat may affect insulin resistance, endothelial function, and atherosclerosis (6,7).

Trans fat has been a popular topic in the news lately due to recent findings in research and subsequent legislation. This has resulted in motions to ban the fat in

restaurants, outlaw it in certain countries, and create new laws about its usage (8). City officials in New York and Chicago have passed laws to ban trans fats from restaurant menus. Other states have introduced bills to remove trans fat including Massachusetts, Connecticut, New Jersey, California, and New Hampshire (8). The controversy lies in the debate between removing trans fats altogether via legislation, or focusing on consumer education and choice (8). Increasing awareness among the general public is always of great importance, but legislation should still be pursued to ensure labels are accurate and to reduce the amount of trans fats used in a foodservice environment.

Many companies are reformulating their products to reduce the level of trans fat. Some is being replaced by healthier alternatives like vegetable oils. But most trans fat is being substituted by other saturated fats or interesterified fats (9). Saturated fats are still unhealthy and have similar negative effects of trans fat. Interesterified fats are created via a new technology to maximize the hardness of the fat while minimizing hydrogenation (9,10). This is achieved by binding the greatest amount possible of liquid oils to a minimum amount of hardstock using fractions of palm oil (10). The long-term safety of interesterified has not been researched, and recent studies are finding that it has negative health effects in addition to trans fat (9). This illustrates that trans fat replacements may not actually be healthier options.

In February of 2007, a newer, trans fat free version of Crisco shortening was introduced (11). The trans fat has been reduced from the original 1.5 grams to a level less than 0.5 grams per tablespoon. Although the label states it is trans fat free, there is still a small amount present. But it has been decreased significantly, which compares well to other brands containing up to 3 grams of trans fat (12). Development of this new

product is beneficial for the company and for consumers. The new version of shortening allows for heart-healthier options and also encourages other manufacturers to reduce trans fat in their products. Crisco still contains 3 grams of saturated fat per serving, but is a much better choice when shortening is needed for items such as in pie crusts and icing (11,12). The level of saturated fat is half the amount found in butter, which also makes it a good alternative (11). The American Heart Association recommends that trans fat intake should be limited to less than 1% of daily calories. This amounts to about 2 grams per day, compared with the estimated average intake of Americans at almost 6 grams each day (13).

Smart Balance Butter Spreads make a variety of claims on their products about the ideal balance of fats that should be consumed (14). The balance that they recommend is based on the guideline that 30% of total calories should be from fat, 10% from saturated fat, and the remaining portion distributed between unsaturated fats. None of their products are made with hydrogenated oil, which means they actually contain zero grams of trans fat (14,15). This is a good feature, but is offset by the 2.5 grams of saturated fat per serving in the regular spread. Their claim is deceptive to consumers who do not understand the negative effects of saturated fat and think they are getting a good balance of fats by using their product (13,15). It is also misleading to physicians, many of whom recommend Smart Balance spreads to their patients. There are better products than Smart Balance for those who are making an effort to consume a heart-healthy diet.

A variety of tub margarines are available with low levels of trans fat, saturated fat, and calories. One of the best choices is Brummel & Brown Spread with Yogurt (16). In

each tablespoon, this spread has 45 calories, zero grams of trans fat, and only 1 gram of saturated fat (13,16). Partially hydrogenated soybean oil is listed on the label, which indicates there is a trivial amount of trans fat (2,13,15). But it is low in calories and saturated fat, and the added yogurt gives it good flavor and texture. Brummel & Brown Spread with Yogurt is a good choice for those aiming to reduce intake of trans and saturated fat (15).

This year, Girl Scout Cookies have been reformulated to be free of trans fat (17). This is a proactive step for the Girl Scouts and is sending the message out to the public that trans fats are not healthy. Like many other products, Girl Scout Cookies still contain trans fat in the form of partially hydrogenated oil, which includes soybean, cottonseed, coconut palm, and palm kernel oils (13,17). A portion of the palm oils may be interesterified fat (10,17). But the amount of trans fat has been reduced, and this accomplishment is increasing awareness in a variety of populations. The Girl Scouts are moving in the right direction by creating healthier options.

Unsaturated Fats

There are currently five different health claims relating food sources of unsaturated fats to reduced risk of heart disease (2). These foods include canola oil, olive oil, walnuts, nuts, and omega-3 fatty acids. All are qualified health claims, so they are required to use this wording: "Limited and inconclusive scientific evidence suggests that eating (specified food and amount) as part of a diet low in saturated fat and cholesterol, without increase in total daily calories may reduce the risk of coronary heart disease" (2). This portion of the claim has not been updated to include trans fat along with saturated fat

and cholesterol. These five claims have all been initiated in the last four years based on the latest research regarding unsaturated fats (2). The wording of the claims is very cautious because the research is not yet established as solid evidence with significant scientific agreement. Although the claims don't sound very convincing, the purpose is to avoid misleading people to believe that consuming specific foods will cure or prevent heart disease. Claims such as these would be more effective if they were only used after SSA has been established.

A meta-analysis was conducted by the International Life Sciences Institute in October 2006 investigating the correlation between a classic Mediterranean diet and coronary heart disease (18). A traditional Mediterranean diet is characterized by high consumption of vegetables, fruits, legumes, nuts, unrefined cereals and olive oil, a moderate intake of fish, dairy products, and wine, and a low intake of saturated fat, meat, and poultry (18,19). Observational studies used in this meta-analysis of ten studies include renowned research such as the Lyon Heart Study, the Seven Countries Study, the EPIC-Greece Cohort Study, PREDIMED Spanish Study, and the Pizarra Study (18). All of these studies have examined various relationships between types of fatty acids and aspects of cardiovascular disease. It was concluded that optimal heart health was highly correlated with the Mediterranean diet, although no specific component was pinpointed (18). The most promising evidence was from olive oil, particularly monounsaturated fat. The aforementioned Nurses' Health Study concluded that polyunsaturated fats are beneficial (6). A recommended intake of up to 7 percent of energy can help in prevention of CHD (6). Other studies examining walnuts and canola oil have established evidence

of modest decrease in blood pressure and primary and secondary prevention of coronary heart disease (20).

Another study in Spain as part of the PREDIMED Study found similar results after testing the Mediterranean diet (19). Researchers divided 772 diabetic adults into three groups: the first group increased vegetable oil and olive oil intake, the second group increased vegetable oil and nut intake, and the third group was placed on a low-fat diet. After a three month period, the first two groups stayed on their diet better and were able to lower blood pressure, cholesterol levels, and serum glucose more than the third group (19). This suggests that unsaturated fats, like those found in the Mediterranean diet help to reduce risk of heart disease (19). Health claims for products with unsaturated fats do have validity, although further research is needed.

On the Canola Harvest company website, all of the information regarding the new canola oil health claim is articulated in detail (21). This claim states, "Limited and not conclusive scientific evidence suggests that eating about 1 ½ tablespoons (19 grams) of canola oil daily may reduce the risk of coronary heart disease due to the unsaturated fat content in canola oil. To achieve this possible benefit, canola oil is to replace a similar amount of saturated fat and not increase the total number of calories you eat in a day. One serving of this product contains [x] grams of canola oil" (2). The company has not changed their product at all, but is now able to advertise the new health claim. They state that canola oil is the oil lowest in saturated fat and helps to lower bad cholesterol (LDL) (21). Canola oil is a good product, but it is still a fat and is very calorie dense. Consumers may start to think that it is health food and not limit their intake (4). The

FDA recommends, but does not require that health claims make a statement that calories should be maintained and that oil is very high in calories (2).

The California Walnut Commission has devoted a large portion of their marketing to touting the health benefits of the walnut (22). It is claimed to be the superfood of the 21st century. The primary health benefit of walnuts comes from alpha-linoleic acid, an essential omega-3 fatty acid (22). There is evidence to show that it may reduce the risk of heart disease and related conditions (22). Walnuts do have health benefits, but should only be consumed in moderation. Like the canola oil, they are very high in calories and fat which could contribute to other problems such as obesity and related conditions.

Plant Stanols and Sterols

Plant stanols and sterols are compounds that are found naturally in a variety of nuts, seeds, vegetable oils, fruits, vegetables, cereals, and legumes (23). They are structurally similar to cholesterol and have essential roles in plant cell membranes where they are located. In the body, they have been found to competitively inhibit intestinal cholesterol absorption and thus reduce serum concentration (23). They do not affect HDL cholesterol levels or serum triglycerides. The amount of stanols and sterols occurring naturally in food is not enough to trigger a cholesterol lowering effect, so they are fortified into food at higher levels by esterification into oils (23).

In the year 2000, a health claim with SSA was approved for stanols and sterols (2). The claim states, "Scientific evidence demonstrates that diets including plant sterol/stanol esters may reduce the risk of coronary heart disease" (2). This is based on the logic that elevated total serum and LDL cholesterol levels are major modifiable risk

factors in the development of CHD. Furthermore, dietary intake of these compounds can help to lower serum cholesterol levels, reducing the risk of heart disease (24,25). To achieve the desired effects, the FDA recommends that 1.3 grams or more of sterols and 3.4 or more grams of stanols be consumed on a daily basis. They should be eaten in two servings at different times of the day combined with other foods to maximize absorption (2). The American Heart Association recommends that only 2 grams be consumed each day (25). The Adult Treatment Panel III from the National Cholesterol Education Program has endorsed use of foods fortified with stanols/sterols as a cost-effective way to lower serum cholesterol and reduce the risk of CHD as compared to the use of medications (26).

There is a considerable amount of research concerning the efficacy of stanols and sterols as a means to lower cholesterol. In 2006, a meta-analysis was conducted to determine consistency of results across a broad range of studies (24). Thirteen studies were examined, six of which were used to draw conclusions based on quality of research and design. The subjects in this meta-analysis ranged from ages 2 to 69, and the time frame of the studies was one to three months. An average daily intake of 2.3 grams sterols/stanols was shown to reduce total cholesterol up to 11 percent and LDL cholesterol 10-15 percent (24). Due to consistent results, it was concluded that plant sterols and stanols can be an effective way to lower cholesterol levels and risk of CHD (24,26). However, the long-term safety of these compounds has not been established.

There are a variety of products available that contain therapeutic amounts of sterols and stanols. The most common fortified foods are margarine and spreads, due to their fat solubility and ease of fortification (23). In 1995, the Raisio Group company

introduced Benecol, a spread that contains 0.85 grams of plant stanol esters per serving (one tablespoon) (27). It additionally has 70 calories, 1 gram of saturated fat, a negligible amount of trans fat, and no cholesterol (15,27). There is also a light version of Benecol spread that has only 50 calories per serving with the same amount of stanols. Using a product like this is a good way to add these compounds into the diet. One drawback is the recommendation to consume three servings of Benecol per day, which would provide about 2.5 grams of stanols (27). Three tablespoons contains 210 calories, which is a high amount to be eating every day, even with the added benefits (15). The American Heart Association recommends that fats and oils be used sparingly, which is contrary to consuming three tablespoons of margarine daily (25,28).The Benecol light spread would be a better option if this amount of margarine is going to be consumed (15).

Benecol is currently introducing Caramel Smart Chews, a new product that will be available soon (28). These soft candies have 20 calories each and provide 0.85 grams of plant stanols esters. Although they are candies, the daily suggestion of two chews per day gives 1.7 grams of stanols with only 40 calories, much less than the margarine spread (28). This new product has potential to be beneficial, but its success and efficacy as a source of stanols/sterols has yet to be established.

In the past year, Mars Inc. launched a product line known as CocoaVia that contains soy sterol esters (29). There are eleven different products including dark chocolates, milk chocolates, blueberry almond chocolates, and drinks that contain 1.1-1.5 grams of sterols per serving. They are generally around 100 calories each and are fortified with calcium, folate, fiber, vitamin B6, vitamin B12, and vitamin E (29). They contain 4 grams of saturated fat per bar, which is not beneficial for those at risk for heart

disease (13,29). But if chocolate is going to be eaten anyway, these treats may be a good alternative based on the variety of beneficial nutrients added.

General Mills introduced Nature Valley Healthy Heart Granola Bars in August of 2005 as another way to incorporate sterols and stanols in the diet (30). These snacks contain 0.4 grams of plant sterols per granola bar, along with 150 calories, 2 grams of fat (0.5 grams saturated fat), and 3 grams of fiber. They are not as good of a source of sterols as the other products mentioned, providing only half the amount (30). But they are low in saturated fat and supply other nutrients, including fiber. If granola bars are going to be consumed in the diet, this product may be a good substitution.

American Heart Association

The American Heart Association is a non-profit organization that increases awareness of cardiovascular disease, educates consumers, and makes recommendations concerning heart health (28). Their efforts are well-received and effective in many regards. They have fundraisers, outreach programs, heart-healthy cookbooks, and ample information available. On their website, there is a Heart Profilers program where participants can gain personal insight to their heart health (28). This organization is a superb resource for people at risk for heart disease that want to increase their knowledge and understanding of the condition.

The AHA has a certification program that recognizes certain foods as heart-healthy (25,28). The intent is good, but certification requirements (see table 2) may be outdated based on current research. This might be misleading and confusing to the general public due to conflicting recommendations from different, but reliable sources.

To have standard certification, there must be less than 3 grams of total fat and 1 gram of saturated fat (25,28). There is not a current recommendation listed for trans fat, which is interesting considering the known effects of trans fat on the cardiovascular system. Although products low in fat can be heart healthy, recent research shows that it is beneficial to consume unsaturated fats in the diet to help reduce the risk of heart disease. The AHA recommendation almost eliminates the possibility of foods high in unsaturated fats from bearing their certification logo. People trust this organization and may depend on their recommendations when making consumer decisions. Based on the current research regarding heart health and fats, the AHA should reconsider the requirements for certification and place more emphasis on the importance of including healthy fats in the diet.

Conclusion

Having approved, up to date health claims is a critical step for the FDA to provide consumers with knowledge to protect their health. The research that health claims are based on is scrutinized and evaluated carefully so as to provide the most accurate information possible. These claims are worded in very exact ways to maximize clarity and avoid misinterpretation from consumers. Additionally, the establishment of health claims encourages manufacturers to create healthier products and keep up to date on recent research. Consumers benefit from this because it increases awareness and provides options in the market. This is advantageous for researchers because their work is recognized and acted upon.

In spite of these positive effects, there are some disadvantages to health claims. At times the claims are not as current as they should be because of the FDA's long approval process. Often consumers interpret health claims in the wrong way or make poor assumptions based on the information they receive. Manufacturers may distort the meaning of the health claim, which leads to greater consumer confusion. Labels can be perplexing to read and to understand the actual meaning. Despite these struggles, the use of health claims can be good and is on the right track to increase consumer knowledge and understanding about current research.

As health professionals, dietitians have an important role in enabling clients to reduce their risk of coronary heart disease. They are responsible for dispelling nutrition myths and aiding people in becoming more informed. Dietitians should be able to educate about the disease state, nutritional methods of prevention and treatment, and heart-healthy products available. To be successful, dietitians must have a thorough understanding of current research and news, know the products on the market and their benefits, and be able to explain health claims to their clients so they can make educated decisions about nutrition and food on a daily basis. Understanding health claims, along with living a healthy lifestyle and having good dietary habits play a part in maximizing heart health.

Appendices

Table 1

NUTRIENT	CLAIM
Calcium	Reduced risk of osteoporosis
Sodium	Reduced risk of hypertension
Dietary saturated fat, trans fat, and cholesterol	Risk of coronary heart disease
Dietary fat	Reduced risk of cancer
Fiber-containing grain products, fruits, and vegetables	Reduced risk of cancer
Fruits, vegetables, and grain products that contain fiber, particularly soluble fiber	Reduced risk of coronary heart disease
Fruits and vegetables	Reduced risk of cancer
Folate	Reduced risk of neural tube defects
Sugar alcohols	Reduced risk of tooth decay
Soluble fiber from whole oats and from psyllium husk	Reduced risk of heart disease
Soy protein	Reduced risk of heart disease
Whole grains	Reduced risk of heart disease and certain cancers
Plant sterol and plant stanol esters	Reduced risk of heart disease
Potassium	Reduced risk of hypertension and stroke

Table 2

	
	Standard Certification
Total Fat	3gms or less
Saturated Fat	1 gm or less
Cholesterol	20 mg or less
Sodium	480 mg or less
Contain 10% or more of the daily value of 1 of 6 nutrients; vitamin A, vitamin C, iron, calcium, protein or dietary fiber	Yes
Trans fat	

References

1. AHA. Heart Disease and Stroke Statistics. http://www.americanheart.org. Accessed March 13, 2007.

2. Label Claims. Center for Food Safety and Applied Nutrition. http://www.cfsan.fda.gov. Accessed March 1, 2007.

3. Center for Food Safety and Applied Nutrition. Claims That Can Be Made for Conventional Foods and Dietary Supplements CFSAN/Office of Nutritional Products, Labeling, and Dietary Supplements September 2003. http://www.cfsan.fda.gov/~dms/hclaims.html. Accessed March 13, 2007.

4. Mazis MB, Raymond MA. Consumer perceptions of health claims in advertisements and on food labels. Journal of Consumer Affairs. 1997; 31(1):10-27.

5. Center for Food Safety and Applied Nutrition. FDA Modernization Act of 1997 (FDAMA) Claims. http://www.cfsan.fda.gov/~dms/labfdama.html. Accessed March 1, 2007.

6. Oh K, Hu FB, Manson JE, Stampfer MJ, Willet WC. Dietary Fat Intake and Risk of Coronary Heart Disease in Women: 20 Years of Follow-up of the Nurses' Health Study. *Am J Epidem.* 2005; 161(7):672-679.

7. Oomen CM, Ocke MC, Feskens EJ, et al. Association between *trans* fatty acid intake and 10-year risk of coronary heart disease in the Zutphen Elderly Study: a prospective population-based study. *Lancet.* 2001; 357:746–751.

8. Zelman KM. Avoiding Trans Fats in Restaurants. http://www.webmd.com/diet/features. Accessed March 14, 2007.

9. Daniells S. Trans-fat alternatives - are they really healthier? http://www.foodnavigator.com/news/ng.asp?id=73471. Accessed March 30, 2007.

10. Korver O, Katan MB. The elimination of trans fats from spreads: how science helped to turn an industry around. *Nutrition Reviews.* 2006; 64(6):275-279.

11. Crisco Shortening Now contains 0 grams Trans fat. http://www.crisco.com. Accessed March 14, 2007.

12. Crisco cuts trans fat from its shortening. www.consumerreports.org. Accessed February 21, 2007.

13. Biesemeier C. Hot Topic: Food Products and Trans Fat – Staying on Top of Recent Changes. American Dietetic Association. 2006.

14. Smart Balance. Product Information. http://www.smartbalance.com. Accessed March 1, 2007.

15. Hurley J, Liebman B. Nutrition Action Health Letter. The Spread Box: Better than Butter? http://www.cspinet.org/nah/12_01/chart.html. Accessed March 5, 2007.

16. Brummel and Brown. Products. http://www.brummelandbrown.com. Accessed March 1, 2007.

17. Girl Scout Cookies. Nutrition Information. http://www.littlebrowniebakers.com/cookies/nutrition. Accessed March 30, 2007.

18. Trichopoulou A, Corella D, Martinez-Gonzalez MA, Soriguer F, Ordovas JM. The Mediterranean Diet and Cardiovascular Epidemiology. *Nutrition Reviews*. 2006; 64(10):13-19.

19. Estruch R, Corella D, Martinez-Gonzalez MA, Salas-Salvado J, Gutierrez V, Covas MI, Fiol M, Gomez-Gracia E, Sabater MC, Vinyoles E, Ros E, Saez G. Effects of a Mediterranean-Style Diet on Cardiovascular Risk Factors: A Randomized Trial. *Ann Intern Med.* 2006; 145:1-11.

20. Mozaffarian D. Does alpha-linoleic acid reduce the risk of coronary heart disease? A review of the evidence. *Altern Ther Health Med.* 2005; 11(3):24-30.

21. Canola Harvest. Product Line. http://www.canolaharvest.com/usa/newsflash.htm Accessed March 1, 2007.

22. California Walnut Commission. Health Benefits of Walnuts. www.walnut.org. Accessed March 14, 2007.

23. International Food Information Council Foundation. Functional Foods Fact Sheet: Plant Stanols and Sterols. http://ific.org. Accessed February 28, 2007.

24. Moriusi KG, Oosthuizen W, Opperman AM. Phytosterols/stanols lower cholesterol concentrations in familial hypercholeserolemic subjects: a systematic review with meta-analysis. *J Am Coll Nutr.* 2006; 25(1):41-48.

25. American Heart Association. Diet and Lifestyle Recommendations Revision 2006: A Scientific Statement from the American Heart Association Nutrition Committee. *Circulation.* 2006; 114:82-96.

26. Grundy SM. Stanol esters as a component of maximal diet therapy in the National Cholesterol Education Program Adult Treatment Panel III Report. *Am J Cardiol*. 2005; 96:47-50.

27. Benecol. Spreads and Smartchews. http://www.benecol.com/products. Accessed March 1, 2007.

28. American Heart Association. www.americanheart.org. Accessed March 1, 14, 28, 30, 2007.

29. CocoaVia Snacks. Nutrition Facts. http://www.cocoavia.com/products/nutrition_facts.aspx. Accessed March 14, 2007.

30. General Mills. Heart healthy products. http://www.generalmills.com/products. Accessed March 14, 2007.

BIOGRAPHY

Elaine Watkins, a native of Salt Lake City, Utah graduated from Highland High School in June 2003. She entered Utah State University in the fall as a Presidential Scholar and Lillywhite Scholar. After a year of long consideration, she chose her field of study in Nutrition Science and Dietetics. During her years at Utah State, Elaine was also an avid participant in the music program and the USU Symphony Orchestra. As a cellist, she performed with the orchestra, various string quartets, and as a soloist. In the fall of 2006, Elaine completed a 1000 hour dietetic internship at various hospitals in the Salt Lake valley. She was selected as the Scholar of the Year for the College of Agriculture for the 2006-2007 school year. She will graduate with departmental honors. After graduation in May 2007, Elaine is going to serve a volunteer mission for the LDS Church. When she returns in January 2009, she plans to get a job in her field and eventually attend graduate school.

Heart Health Claims: Trans Fat, Unsaturated Fats, and Stanols/Sterols

Elaine Watkins
Senior Thesis
April 12, 2007

Objectives

- Evaluate health claims
- Examine recent research
- Consider current events
- Scrutinize products available
  - Trans fat
  - Unsaturated fats
  - Stanols and sterols

Introduction

- Nearly 80 million people have CVD in the U.S.
  - One in three adults
- Number one cause of death
- It is a priority to reduce prevalence:
  - Nutrition education
  - Expand consumer knowledge
  - Regulate safety of foods

Health Claims

- Labeling regulations created by the FDA
  - Identifies the relationship between a food/nutrient and reduced risk of a disease
- Significant Scientific Agreement
  - Qualified experts agree with validity
  - Public evidence supports relationship
- Rigorous review process
  - Can be slow or delayed

Trans Fat

FDA Claim

- Updated on November 15, 2006
- "High intake of saturated fats, *trans* fats, and cholesterol increases the risk of unhealthy blood lipids levels, which, in turn, may increase the risk of coronary heart disease"
- "Consume less than 10% of calories from saturated fatty acids and less than 300 mg/day of cholesterol, and keep *trans* fatty acid consumption as low as possible"

Research

- Nurses Health Study
  - Harvard, ~80,000 women, 20 years
  - Food Frequency Questionnaire
  - *Trans*-fat intake was significantly positively associated with increased risk of CHD
- Meta-Analysis
  - Increases LDL, decreases HDL
  - Affects insulin resistance, endothelial function, and atherosclerosis

Recommendations

- FDA:
  - Keep intake as low as possible
- AHA:
  - Limit trans fat to 1% of calories
  - About 2 grams/day
- Average US intake:
  - 6 grams/day

Crisco

- February 2007
- 1.5 g trans fat to <0.5 g
- 3 g saturated fat
  - Butter has 6 grams
- Best choice for pie crusts, icing
- Motivates other manufacturers

Smart Balance

- Zero trans fat
  - No hydrogenated oil
- Balance of fats
  - 2.5 grams saturated fat
  - 30% total fat in diet
  - 10% saturated fat
- Intake of saturated fat should actually be as low as possible, not balanced

Girl Scout Cookies

- Trans fat free in 2007
  - Cookies still contain hydrogenated oils
  - But any reduction welcomed
- Innovative step
  - Message to young girls
  - General public
- Recognition that trans fat is unhealthy

Trans Fat Replacements

- Saturated fat
  - Better than trans fat, but still unhealthy
- Vegetable oils
  - Good substitute
- Elimination of trans fat
  - Reduction of fat is good
- Interesterified fats
  - Also synthetic
- Replacements aren't always healthier options!

Unsaturated Fats

FDA Claims

- Five current claims relating unsaturated fats to reduced risk of CHD
  - Canola oil
  - Olive oil
  - Walnuts
  - Nuts
  - Omega-3 fatty acids

FDA Claims

- "Limited and inconclusive scientific evidence suggests that eating _____(specified food and amount) as part of a diet low in saturated fat and cholesterol, without increase in total daily calories may reduce the risk of coronary heart disease."

Research

- Meta-analysis
  - Lyon Heart Study
  - EPIC-Greece Cohort Study
  - PREDIMED Spanish Study
  - Pizarra Study
- Nurses Health Study
  - Also displays benefits of including oils in the diet

Mediterranean diet

- High Intake
  - Vegetables
  - Fruits
  - Legumes
  - Nuts
  - Unrefined cereals
  - Olive oil
- Moderate Intake
  - Fish
  - Dairy products
  - Wine
- Low Intake
  - Saturated fat
  - Meat
  - Poultry

Canola Harvest

- Advertise new health claim
  - Approved in 2006
- Product has not been changed
- Canola oil is low in saturated fat and has health benefits
- Fat is still calorie-dense
- May mislead consumers

Walnuts

- Claimed to be the super-fo… century
  - California Walnut Commission
- May have heart-health benefits
  - Alpha-linoleic acid
  - Omega-3 fats
- Again, walnuts are high in calories
  - Energy maintenance is essential

Stanols and Sterols

Stanols and Sterols

- Cholesterol-like compounds
- Found in plant foods
  - Oils, nuts, seeds
  - Fruits, vegetables, grains, legumes
  - Fortified into foods
- Essential roles in cell membranes
- Lower LDL cholesterol
- No effect on HDL cholesterol

FDA Claim

- "Scientific evidence demonstrates that diets that include plant sterol/stanol esters may reduce the risk of coronary heart disease"

Research

- Meta-analysis
  - Thirteen studies
  - One to three months long
  - Average consumption of 2.3 g/day
  - Reduced LDL 10-15%
  - Total cholesterol 11%
- Significant Scientific Agreement
- No solid research on long-term safety

Benecol Spread

- Introduced in 1995
- In one tablespoon:
  - 0.85 g stanols
  - 70 calories
  - 1 g saturated fat
- To get 2.5 g/day stanols, you would need 3 tbsp!
- This is a lot of margarine and calories from fat
- Light version available

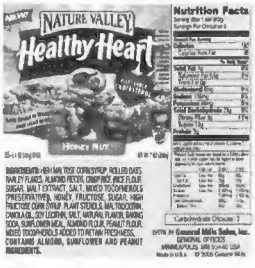
Benecol Smart Chews

- Caramel candies
- For each chew:
  - $0.25
  - 0.85 g stanols
  - 20 calories
- Two chews are recommended per day
- Potential?

CocoaVia

- Per serving:
  - 1.1-1.5 g sterols
  - ~100 calories
  - 4 g saturated fat
  - Fortified with folate, calcium, fiber, B6, B12, and Vit E
- Dark, blueberry almond, and milk chocolate; drinks

Heart Healthy Granola Bars



- Per bar:
  - 0.4 g sterols
  - 150 calories
  - 0.5 g saturated fat
  - 3 g fiber
- Lower fortified levels
- Good substitution

American Heart Association

- Non-profit organization
  - Increases awareness of CVD
  - Provides recommendations
  - Educates consumers
- Purpose
- Website: *Heart Profilers*

Certification

Certification

- AHA certifies foods that are good choices
- No recommendation for trans fat
- Total fat < 3 grams
  - Is this contrary to current findings?
- Unsaturated fat does benefit heart- health
- But . . .

Recent Research

- March 2007
  - American College of Cardiology
- Compared low-fat (AHA) diet to Mediterranean diet
- Had same effectiveness
- The key was regular dietary counseling

Role of Dietitian

- Dispel nutrition myths
- Educate about
  - The disease state
  - Prevention and treatment
- Understanding of current research
- Know the products on the market
- Explain health claims
- Counsel on an individual basis

Conclusion

- Health claims are a part of improving heart health
- Many other factors involved!
  - Dietary habits
  - Lifestyle
  - Environment
- Keep the big picture in mind!

References

- AHA. Heart Disease and Stroke Statistics. Accessed March 13, 2007.
- Label Claims. Center for Food Safety and Applied Nutrition. Accessed March 1, 2007.
- Center for Food Safety and Applied Nutrition. Claims That Can Be Made for Conventional Foods and Dietary Supplements CFSAN/Office of Nutritional Products, Labeling, and Dietary Supplements September 2003. Accessed March 13, 2007.
- Mazis MB, Raymond MA. Consumer perceptions of health claims in advertisements and on food labels. *Journal of Consumer Affairs*. 1997; 31(1):10-27.
- Center for Food Safety and Applied Nutrition. FDA Modernization Act of 1997 (FDAMA) Claims. Accessed March 1, 2007.
- Oh K, Hu FB, Manson JE, Stampfer MJ, Willet WC. Dietary Fat Intake and Risk of Coronary Heart Disease in Women: 20 Years of Follow-up of the Nurses' Health Study. *Am J Epidem*. 2005; 161(7):672-679.
- Oomen CM, Ocke MC, Feskens EJ, et al. Association between trans fatty acid intake and 10-year risk of coronary heart disease in the Zutphen Elderly Study: a prospective population-based study. *Lancet*. 2001; 357:746-751.
- Zelman KM. Avoiding Trans Fats in Restaurants. Accessed March 14, 2007.
- Daniells S. Trans-fat alternatives - are they really healthier? Accessed March 30, 2007.
- Korver O, Katan MB. The elimination of trans fats from spreads: how science helped to turn an industry around. *Nutrition Reviews*. 2006; 64(6):275-278.
- Crisco Shortening How contains 0 grams Trans fat. Accessed March 14, 2007.
- Crisco cuts trans fat from its shortening. Accessed February 21, 2007.
- Bassemeier C. Hot Topic: Food Products and Trans Fat – Staying on Top of Recent Changes. American Dietetic Association. 2006.
- Smart Balance. Product Information. Accessed March 1, 2007.
- Hurley J, Liebman B. Nutrition Action Health Letter. The Spread Sex: Better than Butter? Accessed March 9, 2007.
- Brummet and Brown. Products. Accessed March 1, 2007.
- Girl Scout Cookies. Nutrition Information. Accessed March 30, 2007.
- Trichopoulou A, Costacou D, Martinez-Gonzalez MA, Seriguer F, Ordovas JM. The Mediterranean Diet and Cardiovascular Epidemiology. *Nutrition Reviews*. 2006; 64(10):13-19.
- Estruch R, Corella D, Martinez-Gonzalez MA, Salas-Salvado J, Gutierrez V, Covas MI, Fiol M, Gomez-Gracia E, Salaster MC, Virgolas E, Ros E, Saez G. Effects of a Mediterranean-Style Diet on Cardiovascular Risk Factors: A Randomized Trial. *Ann Intern Med*. 2006; 145:1-11.
- Mozaffarian D. Does alpha-linolenic acid reduce the risk of coronary heart disease? A review of the evidence. *Altern Ther Health Med*. 2005; 11(3):24-30.
- Canola Harvest. Product Line. Accessed March 1, 2007.
- California Walnut Commission. Health Benefits of Walnuts. Accessed March 14, 2007.
- International Food Information Council Foundation. Functional Foods Fact Sheet: Plant Stanols and Sterols. Accessed February 28, 2007.
- Mortuel KD, Oosthuizen W, Opperman AM. Phytosterols/stanols lower cholesterol concentrations in familial hypercholesterolemic subjects: a systematic review with meta-analysis. *J Am Coll Nutr*. 2006; 25(1):41-48.
- American Heart Association. Diet and Lifestyle Recommendations Revision 2006: A Scientific Statement from the American Heart Association Nutrition Committee. *Circulation*. 2006; 114:82-96.
- Grundy SM. Plant sterols as a component of medical diet therapy in the National Cholesterol Education Program Adult Treatment Panel III Report. *Am J Cardiol*. 2005; 96:47-50.
- Benecol. Spreads and Smartchews. Accessed March 1, 2007.
- American Heart Association. Accessed March 1-14, 26, 30, 2007.
- CocoaVia Snacks. Nutrition Facts. Accessed March 14, 2007.
- General Mills. Heart healthy products. Accessed March 14, 2007.