

PUBLISHER'S NOTE

This is the first edition of *SALEM HEALTH: Nutrition*. It joins the family of Salem Health encyclopedias, including *Magill's Medical Guide*, *Psychology & Behavioral Health*, *Addictions & Substance Abuse*, *Complementary & Alternative Medicine*, *Infectious Diseases & Conditions*, *Genetics*, *Cancer*, and *Adolescent Health & Wellness*. This three-volume set—with 255 entries—covers not only the nutritional value of dozens of foods and food groups, but includes nutritional therapy, how diet affects certain medical conditions, and societal issues such as fad diets and obesity.

Volume 1—Food Groups—covers Fruits, Vegetables, Grains, Proteins, and Dairy—with individual, detailed entries on specific foods, followed by entries on specific Beverages, Herbs & Spices, and Fats & Oils. Following the entries in Volume 1 is nutrition information from the USDA.

Volume 2—Medical Nutrition Therapy for Various Diseases—offers information on how what you eat affects a variety of medical and mental conditions from autism and bipolar disorder to ulcers and urinary tract infections. You'll read about which foods will help and what to avoid. This volume includes a cancer prevention diet, food addiction, and food allergies.

Volume 3 includes Dietary Considerations, Nutrition Through the Lifespan, and Micronutrients. It covers various diets, eating for your age, and specific information on vitamins and minerals. Volume 3 also includes two appendixes and a detailed index.

ORGANIZATION AND FORMAT

Entries in *Nutrition* range from one to eight pages in length. The text of each entry offers a clear and concise discussion of the topic. Subheads appear frequently, and include What We Know, Nutrients, Medical Nutrition, Research Findings, and Risk Factors.

Each entry includes not only the author's name but the names of those who reviewed the material as well.

RESOURCES AND INDEXES

A complete Table of Contents appears at the beginning of each volume. USDA information appears at the end of volume 1. Appendixes and Index appear at the end of Volume 3.

USDA INFORMATION

This section comprises 70 pages of information from the U.S. Department of Agriculture. A detailed table of contents lists the 33 charts and tables in this section, including the 2015-2020 Dietary Guidelines for Americans, Eating Patterns, Making Healthy Shifts, Average Intakes of Grain, Fats, Sugar, and Sodium, MyPlate food guidelines, several healthy eating patterns, and the new food label.

APPENDIXES

No Nutritional Value But Some Benefits

This section includes items like artificial sweeteners (helps with weight control), chewing gum (reduces tooth decay), and popcorn (increases fiber intake).

Cultural Challenges to Good Nutrition

Read about Food Deserts (urban neighborhoods and rural areas without access to nutritious food), Obesity in both the general population and among Veterans, and Ramadan Fasting (28 days of fasting in observance of Muslim holy days).

INDEX

Subject Index alphabetically lists all the significant people, places and concepts covered in this set.

ACKNOWLEDGMENTS

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EDITOR'S INTRODUCTION

The topic of nutrition is unique in that it affects every single person in the world. We all eat. Every human being on the planet requires nutrition to fuel their body. For years, media, marketing teams, and food and drug manufacturers – from milk farmers to vitamin makers – have been capitalizing on the fact that we all want to be healthy and fit. The barrage of messages to consumers are often confusing and conflicting. There are endless opinions about what it means to follow a healthy diet and how to receive optimal nutrition from food. *Salem Health: Nutrition* is designed to help consumers focus on the source of nutrition information. As a registered dietitian nutritionist (RDN), two of my important goals are 1. help consumers decipher between fad diets and food trends and 2. provide healthy and sick individuals of all ages guidance on how the proper diet can meet their nutritional needs and provide optimum health for their unique medical conditions. In three comprehensive volumes, *Salem Health: Nutrition* meets these goals and more. Remember, you are what you eat!

Following a nutritious diet means eating a variety of delicious, fresh foods, while avoiding processed and fast food options. A good rule of thumb is that if your plate looks like a rainbow of colorful foods, chances are it contains a good variety of protein, grains, vegetables, fruits and dairy. You should avoid following a diet that eliminates food groups or includes an excessive amount of certain “super foods.” In addition to what you eat, good nutrition is defined by how much you eat. Healthy eating consists of eating all foods in moderation – no self-deprivation. Focus more on adding healthy foods into your diet, and less on what to avoid. Look at meal time as an opportunity to fuel your body with nutritious goodness, and *Salem Health: Nutrition* as a tool with the information you need to make healthy food choices.

This encyclopedia is conveniently organized into three volumes. Volume 1 analyzes the nutritional value of hundreds of different foods. Each food is categorized according to its appropriate food group – fruits, vegetables, grains, protein, dairy, beverages, herbs/spices and fats/oils. The articles specify nutrient content, dietary intake guidelines and current research findings. You will learn how the simple act of eating your favorite foods is keeping you strong and healthy. Did you know that papaya contains a vitamin that helps build new DNA, or that chicken meat and eggs are rich in energy-producing B complex vitamins? Volume 1 also includes a section of important nutrition material from

the United States Department of Agriculture that includes 2015-2020 Dietary Guidelines for Americans, eating patterns, and a variety of healthy eating styles.

Volume 2 focuses on how medical nutrition therapy (MNT) can help treat various disease states, and is a valuable resource for patients, and their families, who are struggling with illness. MNT determines how nutritional status and interventions can impact diseases, such as cancer, diabetes, heart disease and even mental illness. MNT for less severe conditions such as constipation and diarrhea, urinary tract infections and acne is also explored. You will learn how the prevention, progression and treatment of disease may be impacted by the addition or avoidance of certain foods. For example: foods rich in omega-3 fatty acids can reduce the depression and aggressive behavior associated with Alzheimer's disease; complex carbohydrates can stabilize moods swings that often accompany alcohol withdrawal; and soybeans and soy products can reduce high blood pressure.

Volume 3 consists of an assortment of topics associated with a healthy diet, including eating breakfast, avoiding fast food, and getting enough sleep. Furthermore, the nutrition implications associated with the most recent dietary guidelines of MyPlate are compared with the previous MyPyramid model. Volume 3 also includes a section of articles dedicated to the nutrition requirements throughout the lifespan that address how nutritional needs change with age. Coverage includes how best to eat during pregnancy and breastfeeding, how to encourage healthy eating in children, which foods can help reduce menopause symptoms, and how specific food choices can help older adults both mentally and physically. Also in Volume 3 is analysis of micronutrients (vitamins and minerals) by their action in the body, food sources, potential for deficiency/toxicity/medication interaction, and current research. Did you know beans are a good source of vitamin K, or that vitamin B12, required for the formation of RNA and DNA as well as proper function of the nervous system, is only found in foods of animal origin or select fortified foods?

I would like to thank Grey House Publishing and the Salem Press team, for the opportunity to work on this worthwhile project: Kristen Thatcher, longtime friend, for referring me; Melissa Rose, for her assistance with all details and her calm, kind demeanor; and Laura Mars, for brainstorming sessions to overcome challenges.

Dawn Ortiz, MS RDN

HERBS & SPICES

Black Cohosh

WHAT WE KNOW

Black cohosh (*Actaea racemosa* or *Cimicifuga racemosa*) is an herbaceous, perennial plant from the *Ranunculaceae* (i.e., buttercup) family. Native to North America, black cohosh is a shrub that grows to be 3–8 feet tall and has large, feather-like leaves and a long plume of white flowers. The black creeping root, or rhizome, is harvested in the fall and is the portion of black cohosh that is used for medicinal preparations. With a long history of therapeutic use in both folk and traditional medicine, black cohosh is most noted for its role in the treatment of hot flashes and other symptoms of menopause. Although it was originally believed that black cohosh acted as a phytoestrogen, evidence regarding this theory is conflictive. Currently, there is no clear explanation for the mechanism of action for black cohosh.

ACTION OF BLACK COHOSH

- The active constituents in black cohosh rhizomes include triterpene glycosides, tannins, and resin (e.g., a natural plant compounds), along with fatty acids, starch, and sugar.

DOSAGE AND ADMINISTRATION

- The dosage that is most commonly used in research studies of black cohosh is 20–40 mg in tablets of standardized extract that are taken twice daily for a period of up to 6 months.

ADVERSE REACTIONS AND MEDICATION INTERACTION

- Women who are pregnant should avoid taking black cohosh due to the lack of research on its effects during pregnancy.
- Black cohosh is not recommended for persons with liver dysfunction due to the rare adverse effect of liver malfunction.
- Black cohosh is not recommended for women who have or previously had breast cancer, uterine

cancer, or endometriosis due to the potential for estrogen-like activity.

- Persons at high risk for stroke or blood clots and persons with a seizure disorder should avoid taking black cohosh.
- Black cohosh should not be taken by individuals who are allergic to aspirin
- Black cohosh should not be taken with birth control pills, hormone replacement therapy, sedatives, or blood pressure medication without the close supervision of a doctor.

RESEARCH FINDINGS

- Evidence supporting the use of black cohosh extract for the treatment of menopausal symptoms is being questioned. A review of 16 studies reported that there was inadequate evidence to suggest the medicinal use of black cohosh for menopausal symptoms. However, authors of a meta-analysis of 9 randomized, placebo-controlled trials reported that in 6 of the studies, significant improvement was noted in the groups who received black cohosh compared with the groups who received placebo. Because black cohosh is one of the most commonly used herbal remedies for menopausal symptoms, researchers recommend that more research be conducted to determine if black cohosh is an effective and safe alternative to hormone replacement therapy.
- There have been claims that black cohosh can be used medicinally to treat some forms of cancer (e.g., lung), however, research does not support such claims. Additionally, there is evidence that black cohosh can interfere with some chemotherapy medications.

SUMMARY

Consumers should become knowledgeable about the physiologic effects of black cohosh. Black cohosh is rich in beneficial plant compounds making it a popular nutrition supplement. Research suggests black cohosh may

aid in treating menopause symptoms and lung cancer, however further studies are needed to support claims and black cohosh may interfere with chemotherapy treatment.

—Cherie Marcel, BS

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Butterbur

WHAT WE KNOW

Butterbur, or *Petasites hybridus*, is an ancient, perennial, broad-leafed shrub from the sunflower, or *Asteraceae* family. Butterbur is also known as bladderdock, bog rhubarb, bogs horns, butter dock, and pestwurz. Butterbur grows throughout Europe and in Asia and North America in wet ground, and is frequently found by rivers and streams and in damp forests. As early as 65 A.D., a Greek physician named Dioscorides described the use of butterbur in medicine to treat fever, plague, chronic cough, asthma, gastrointestinal (GI) distress, and wounds. Modern science has affirmed that butterbur exhibits anti-inflammatory, antispasmodic, and antihistamine properties. Butterbur is primarily used currently to treat migraine headaches, hay fever, and asthma.

ACTION OF BUTTERBUR

- Along with a variety of phytochemicals (i.e., beneficial plant-derived chemicals; e.g., flavonoids, tannins, pyrrolizidine alkaloids), the predominant active constituents in butterbur are petasin and isopetasin:
 - Petasin has antispasmodic activity, relaxing smooth muscle and vascular walls, and reducing swollen membranes. It also acts as an antihistamine by decreasing the activation of mast cells, which interferes with the release of leukotrienes and histamine into circulation.
 - Isopetasin prevents the activation of inflammation.

RECOMMENDED DOSAGE AND ADMINISTRATION

- A dosage of 50–75mg of standardized butterbur root extract (containing 7.5 mg of isopetasin and petasin) can be taken twice daily. It is important

that the extract does not contain pyrrolizidine alkaloids (PA), which can cause liver damage.

ADVERSE REACTIONS AND MEDICATION INTERACTION

- Butterbur contains PA, a plant toxin known to cause liver damage and increase the risk of developing liver cancer. Removing PA from preparations of butterbur intended for medicinal use is important.
- Women who are pregnant should not use butterbur because safety during pregnancy has not been established.
- Butterbur can interact with anticholinergic (i.e., medications that block the action of the neurotransmitter acetylcholine in the brain) such as ipratropium bromide, oxitropium bromide, and tiotropium.

RESEARCH FINDINGS

Results of many studies show significant evidence that standardized butterbur root extracts are effective in the prevention and reduction of asthma, seasonal allergies, and migraine headaches. In some cases, the effect of butterbur is equivalent to that of medications such as fexofenadine and cetirizine in the reduction of allergy symptoms. Researchers have also reported the medicinal use of butterbur to be safe, effective, and well tolerated (even among pediatric patients), with only occasional reports of belching as an adverse effect. While these results are promising, researchers suggest that more human trials be performed to confirm these findings and to determine the most effective therapeutic dosages for each condition.

SUMMARY

Consumers should become knowledgeable about the physiologic effects of butterbur ingestion. Butterbur is a good source of phytochemicals, which act as natural muscle relaxers and inflammation reducers. Research suggests that butterbur may help treat asthma symptoms, migraine headaches and allergic reactions.

—Cherie Marcel, BS

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Cacao**WHAT WE KNOW**

The cacao tree, or *Theobroma cacao* (meaning food of god), produces the cacao bean and is more commonly known as the cocoa bean. Fermented and dried cocoa bean is the primary ingredient in chocolate. By adding varying quantities of milk solids and sweeteners to cocoa bean, its characteristic bitterness is reduced, resulting in chocolate that ranges from dark (containing a greater amount of pure cocoa) to light (containing less pure cocoa and more milk). The fat of the cocoa bean is used to make cocoa butter, which is often used as an ingredient in skin creams and fragrances. Chocolate is a well-known culinary substance that is used in baking, flavoring, cooking, and beverages. Cocoa beans have also been used medicinally for thousands of years. The ancient Mayan and Aztec civilizations are recorded as the first to use cocoa bean preparations to treat persons with ailments of the cardiovascular, gastrointestinal (GI), and nervous systems. Cocoa bean has been used to treat pain, such as toothache, rheumatism (i.e., joint pain), and abdominal discomfort. Modern research has established that the consumption of dark chocolate provides numerous health benefits, including a reduced risk for heart attack and stroke, cancer prevention, anti-inflammatory action, and improved cognitive function. These benefits are predominantly due to the polyphenolic compounds (i.e., plant-derived protective chemicals) within the cocoa bean.

ACTION OF COCOA BEANS

- Cocoa bean contains a variety of bioactive compounds, including fat, alkaloids, and polyphenolic compounds such as flavonols and procyanidins. The antioxidant properties identified in cocoa bean are primarily attributed to the polyphenols. The noted actions and benefits of these compounds include the following:
 - Polyphenols help to prevent type 2 diabetes mellitus, by decreasing insulin resistance



- The monomeric flavonols epicatechin and catechin are thought to decrease risk of cardiovascular disease (CVD) and hypertension by preventing the oxidation of low-density lipoproteins (LDLs), enhancing endothelium-dependent relaxation, reducing inflammation, and inhibiting clot formation by the modulation of platelet function.
- flavonols and procyanidins prevent cellular oxidation and eliminate reactive oxygen species
- By increasing cerebral blood flow, the flavonols in cocoa bean improve sensitivity to visual contrast, spatial memory, and reaction time.
- Other attributes of polyphenolic compounds include anti-carcinogenic activity, support of intestinal flora (i.e., “good” or “friendly” bacteria), and improvement of psychological well-being by reducing stress hormones and stimulating the release of opioids from the brain.

RECOMMENDED DOSAGE AND ADMINISTRATION

- No specific guidelines exist for therapeutic use of cocoa bean, although researchers suggest that 1 cup of dark chocolate daily is beneficial. If eating chocolate bars, a dark chocolate bar with at least 65 percent cacao that contains cocoa butter is more nutritious than a chocolate bar with a lower percent cacao that has added oils or hydrogenated or partially hydrogenated fats.
- Due to the natural caffeine content of cocoa bean, consumption of chocolate (particularly

dark chocolate) can worsen certain conditions, including gastroesophageal reflux disease (GERD) and insomnia or other sleep disturbance

RESEARCH FINDINGS

- Results of numerous studies show that moderate consumption of dark chocolate with a high cocoa content reduces the risk of heart disease and stroke. Results of one study found that 28 days of supplementation with cocoa flavonols and procyanidin significantly decreased the risk of blood clots. Researchers in a study in Germany found that adults aged 36–65 years who consumed higher amounts of dark chocolate have a lower risk for heart disease and stroke. Because chocolate has a high calorie content, excessive quantities should be avoided. Results of one study following the chocolate intake of 31,823 women aged 48–83 showed that women who consume 1–3 servings of chocolate each week are 26% less likely to experience heart failure than women who did not consume chocolate. Those who consumed 1–2 servings of chocolate each week had a 32% lower risk for heart failure. The women who consumed 3 or more servings of chocolate each week experienced no benefit compared with women who did not eat chocolate. Researchers hypothesized that this could be due to the added calories supplied by higher chocolate intake.
- Researchers report that cacao enhances the bioavailability of polyphenols (e.g., epicatechin) and that modifying cocoa powder to contain physiologically relevant concentrations of theobromine could promote human health by significantly increasing the absorption of beneficial polyphenols.

SUMMARY

Consumers should become knowledgeable about the physiologic risks and benefits of the consumption of cocoa bean.

Cocoa beans are rich in polyphenols which may help lower blood pressure and total cholesterol, and may help prevent type 2 diabetes, heart disease and cancer. Research suggests consumption of cocoa beans may improve overall health, although cocoa bean consumption from chocolate bars should be limited due to the high fat content. Cocoa beans contain caffeine which may cause GERD complications and sleep disturbances.

—Cherie Marcel, BS

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Food Deserts

Food deserts are considered to be urban neighborhoods and rural areas without access to fresh, healthy, affordable food. Food deserts lack supermarkets and grocery stores and are served by fast food restaurants and convenience stores which typically offer limited healthy, affordable food choices. The USDA Economic Research Service estimates that approximately 23.5 million people live in food deserts and more than half of those individuals are considered to be low-income. The USDA Treasury and the Department of Health and Human Services uses census tracts to determine whether an area is a food desert. In order to meet the criteria of a food desert, the census tract must meet the low-income and low-access threshold.

- Low income – a poverty rate of 20% or greater or a median family income at or below 80% of the area median family income
- Low access – at least 500 persons and/or 33% of the census tract's population live more than one mile from a supermarket or large grocery store
- Ten miles for non-metropolitan or rural areas

RESEARCH FINDINGS

- Researchers are beginning to examine the definition and measures used to determine food deserts, as research has not consistently shown a relationship between food deserts and health outcomes. Investigators have found that the current definition of food deserts only considers distance to a supermarket and poverty rate within a specific geographic location. These criteria do not take into consideration other factors that influence food consumption behaviors such as travel duration and mode, supermarket food costs, and time.
- Authors of a study conducted a study in King County, Washington to explore new ways of identifying food deserts. These researchers suggest that other measures of access to food need to include travel duration, mode of travel, and supermarket food costs.
- Other investigators suggest that including a temporal component such as the temporality of the food system and the mobility of individuals to food desert research may offer more insight into food deserts and their effects on health outcomes.
- A limited amount of studies have explored the geographic effect of residency on diet and health outcomes and the results are mixed.
- Authors of a study examined whether residency within or outside of Detroit was correlated with shopping and eating behaviors and dietary intake and obesity among adults in the Metro Detroit area. Results indicated that living in a geographic area considered to be a food desert did not significantly correlate with body mass index (BMI) once other covariates were considered.
- Some rural areas in Canada have been designated as food deserts. As such, some scholars believe that these food deserts are contributing to adolescent obesity in Canada. Yet authors of a qualitative study of 51 teens from Canada explored the notion that adolescent obesity's association with rurality is inflated. Results of their qualitative findings suggested that youth obtained fresh, healthy foods in part through an informal economy of growing and sharing food. The authors encourage others to more critically examine the notion of rural obesity and food deserts in Canada while being mindful of the stereotyping that is associated with classifying those who live in rural areas.
- In a study to explore the predisposing, reinforcing and enabling factors affecting consumption of a Mediterranean diet in a rural Appalachian food desert in Kentucky, investigators found that rurality played a significant role in factors that affect diet choices. However, it was

also noted that many of the factors that affected diet choices were amenable to behavioral interventions.

- In a study in rural Pennsylvania investigators found a relationship between increased rates of childhood overweight and the percentage of the district living in a food desert using geographic information systems to identify food deserts. Greater supermarket availability does not necessarily correlate to improved diet quality or lower BMI
- Researchers found that increased supermarket availability generally did not correlate with diet quality, fruit and vegetable intake. The results also indicated mixed findings for the relationship between grocery store availability and dietary outcomes.
- Other authors of a study did not find consistent data that demonstrated access to a large supermarket correlated with a lower BMI. Their findings also did not demonstrate that increased exposure to fast food restaurants, convenience stores, and small food stores correlated with an increased BMI.
- Investigators found that low uptake of a new supermarket as the primary shopping source for food and the presence of the supermarket did not have a significant effect on BMI or diet behaviors.
- Food deserts appear to have an adverse correlate with academic achievement
- In a sample of 232 suburban and urban school districts in New York State, open-source databases were examined to obtain scores for 4th graders on science, English, math, demographics, socioeconomic factors, school district quality, and food desert data. After accounting for other predictors, the researchers noted a significant relationship between living in food deserts and test scores.

For more information about food deserts and how to access healthy foods visit the following websites:

- The United States Department of Agriculture - <http://apps.ams.usda.gov/fooddeserts/fooddeserts.aspx>
- The Centers for Disease Control - <http://www.cdc.gov/features/fooddeserts/>
- Information about Government Food Assistance Programs such as Food Distribution Programs, Child Nutrition Programs, the Supplemental Nutrition Assistance Program, Women, Infants and Children, and Farmer's Markets:
—<http://www.fns.usda.gov/programs-and-services>

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Obesity in a Diverse Culture

In the United States, it is estimated that nearly two thirds of adults and one third of children are overweight or obese. Because of the rising prevalence of obesity among adults and children of every ethnic and racial group, and because obesity contributes to the development of devastating diseases, including diabetes mellitus, type 2 (DM2), hypertension (HTN), and cardiovascular disease (CVD), it has been referred to by the United States Centers for Disease Control and Prevention (CDC) as a national epidemic.

Obesity in the United States has traditionally been oversimplified as a disorder caused by physical inactivity and the unhealthy nature of the typical Western diet (i.e., a diet that consists mainly of processed and fast foods high in sodium, sugar, and fat). However, although obesity rates are increasing across all sociocultural groups, the overall incidence of obesity and related diseases is not equal among all Americans. Data show that rates of obesity and related diseases are significantly higher among Blacks, Hispanics, Pacific Islanders, and Native Americans than among Whites and Asians; higher among persons of low socioeconomic status (SES); and differ between individuals within the same ethnic/cultural groups. Thus, obesity is now recognized as a complex disorder caused by the interplay of multiple contributing factors. Ethnic, racial, and cultural factors have been found to influence obesity in the following ways: through genetic predisposition, by affecting