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Herbs or Natural Products That Increase Cancer Growth or Recurrence

Part Two of a Four-Part Series

Muriel J. Montbriand, PhD, RN

Purpose/Objectives: To review 32 herbs and natural products that show potential to increase cancer growth or recurrence or to interfere with cancer treatments.

Data Sources: Natural Medicines Comprehensive Database and Lawrence Review of Natural Products—Monograph System.

Data Synthesis: Early evidence shows that patients who have or have had cancer should avoid 32 herbs and natural products. Some herbs and natural products have estrogenic effects that enable these products to compete with hormone cancer therapies, whereas others interfere with chemotherapy treatment or may induce recurrence of cancer.

Conclusions: Healthcare professionals can be resources for patients who have cancer, helping them to avoid or identify products that may induce cancer growth or interfere with cancer treatment.

Implications for Nursing: The information in this article is designed to provide quick access for healthcare professionals working in clinical oncology.

Key Points . . .

- ▶ Some herbs and natural products may increase cancer growth or recurrence.
- ▶ Patients who have or have had cancer should avoid these 32 herbs and natural products.
- ▶ Oncology nurses can become better resources for healthcare professionals and patients regarding herbs and natural products.

Montbriand (2000a, 2000b) found that 97% of 100 randomly selected physicians, pharmacists, and nurses did not believe that their knowledge about alternative therapies was adequate. Therefore, even preliminary research information can help healthcare professionals alert their patients of possible dangers and interactions when herbs and natural products are used with cancer or treatments.

This review article is the second of a four-part series on herbs and natural products that may decrease or increase cancer growth. The four parts of the series are

- Part I: herbs and natural products that may decrease cancer growth in patients with cancer

Muriel J. Montbriand, PhD, RN, is an associate professor in the College of Nursing and a research associate in applied research/psychiatry in the College of Medicine at the University of Saskatchewan in Saskatoon, Canada. During this work, the author was a recipient of two Health Services Utilization and Research Commission, Socio-Health Grants, in Saskatoon. (Mention of specific products and opinions related to those products do not indicate or imply endorsement by the Oncology Nursing Forum or the Oncology Nursing Society.)

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Preliminary evidence shows that some common foods and beverages and some not so commonly known chemicals in herbs and natural products can promote cancer growth or recurrence or can interfere with cancer treatments. This article provides evidence-based information about 32 herbs and natural products that early research has shown may have the potential to increase cancer growth. Common, scientific, and brand names of products are given, as well as the typical doses and potential adverse effects. The intent in providing this information is to assist healthcare professionals to become better resources for patients with cancer.

Many publications are devoted to questioning the prevalence of using alternative or complementary therapy by patients with cancer (e.g., Ernst, 2000a, 2000b; Ernst & Cassileth, 1998; Perlman, Eisenberg, & Panush, 1999; "Questionable Methods of Cancer Management," 1993; Sparber et al., 2000; Sparber & Wootton, 2001; White, 2002). Rather than look at prevalence of use, which seems to be abundant, this series of articles endeavors to provide preliminary research about products that interact with cancer, either positively or negatively.

- Part II: herbs or natural products that may increase cancer growth in patients with cancer
- Part III: herbs and natural products that may protect against cancer growth in patients who do not have cancer
- Part IV: herbs and natural products that may potentiate cancer growth in patients who do not have cancer.

Some herbs and natural products are found in more than one part of this series. In some cases, these products can act differently in the bodies of patients who have or have had cancer compared to their action in patients who never have had cancer. For example, in this article, research shows that soy products may increase cancer growth, especially for women who have breast cancer. Soy also will be covered in Part III, where studies are cited that have reported that soy has a tendency to protect individuals against developing cancer. Most of the studies reviewed are in vivo studies, performed on tissues not removed from a living organism (an animal), or in vitro studies, performed in glass on tissues from a living organism. When a human study is cited, it is usually a preliminary clinical trial.

When possible, typical doses are given to indicate approximately how much of a product has been used in a study or advised by the manufacturer. The typical dose is not to be construed as the recommended dose. When a recommended dose is given, it is usually a vitamin or mineral and has been recommended by the U.S. Food and Drug Administration or Health Canada. Individuals who self-medicate with vitamins or minerals often take the products in higher doses than recommended (Montbriand, 1994a, 1995a, 1995b, 1997, 2000a, 2000b). Knowing the recommended dose can help health-care professionals determine whether a patient is exceeding it.

Names of herbs and natural products with potential to increase cancer growth have been found in the listings from the Natural Medicines Comprehensive Database (2003) and the Lawrence Review of Natural Products—Monograph System (Facts and Comparisons, 2001). Information about the products listed in this article has been taken from the studies cited in the references. Other herbs or natural products with potential to enhance cancer growth may exist, but this review relies only on the professionals and advisory boards of the two above-named monograph and database series.

Table 1 is provided as a quick reference in locating an herb, a natural product name, or the name of a product component. Notice that 25 of these 32 herbs and natural products have the potential to enhance the growth of hormone-sensitive cancers, such as breast, uterine, and ovarian cancers. A quick reference of these 25 herbs and products is found in Table 2. Estrogenic effects can compete for estrogen receptors, causing transcription activities in estrogen-responsive cells. This action can interfere with hormone therapies, such as tamoxifen, taken by women with breast cancer.

Herbs and natural products have numerous names. The scientific name for herbs consists of the genus (scientific classification of a group of plants with common characteristics) followed by the species (unique plants in that genus). Common names and brand names also are listed in Tables 1 and 2. Notice on a brand name label how many herbs or natural products are listed in Table 1. Many products contain more than one item with the potential to enhance cancer growth. For example, a product named Menopause (Nutrivation, San Antonio, TX) contains vitamin C 50 mg, vitamin E 100 IU, lico-

rice root 100 mg, wild yam root 150 mg, chaste tree berry 150 mg, dong quai root 150 mg, unicorn root 100 mg, and black cohosh root 50 mg. All of these herbs or natural products have the potential to increase cancer growth. Patients with hormone-sensitive cancers should not take the latter five herbs. Tables 1 and 2 list multiple common names for herbs and natural products. For example, chaste tree berry is also known as chasteberry, and unicorn root and aletris are the same products. Therefore, a scan through the various common names can identify products or herbs bearing different common names in the tables.

Products must be used wisely. Patients seek what they perceive as natural products to alleviate a discomfort, but manufacturers sell products aimed at symptoms and conditions. Be alert to all brands using names that target specific conditions, such as hot flashes and menopause, among others.

Some herbs and natural products have many brand names. Listing them all is not possible; however, brand names with single components of herbs are listed where possible. If a product bears the name of a specific herb or component, it usually is a product with the highest amount of that herb or natural product. If numerous ingredients are listed, the amount of each ingredient typically is smaller than in products with only one listed ingredient. When a product is composed of numerous ingredients, the risk of potential side effects is increased because each ingredient can have side effects. Notice the concern about the safety of products made from animals. The tables in this article may be used as a quick reference to find a product or herb before reading additional information in the text.

Neither the author nor publisher makes any medical claims for any of the herbs or natural products in this review or the tables. This is informational literature. Note that some of the herbs described are deadly poisons and that some are extremely dangerous.

Herbs and Natural Health Products With Potential to Increase Cancer Growth

Aletris, with a scientific name of *Alertis farinosa*, is used in self-medication for rheumatism and female disorders. Aletris also is used as a tonic, sedative, laxative, antispasmodic, antidiarrheal, and diuretic (Leung & Foster, 1996). Estrogenic properties of this herb make it prohibitive for women with hormone-sensitive cancers (McGuffin, Hobbs, Upton, & Goldberg, 1997). Adverse effects include colic, stupefaction, and vertigo (Facts and Comparisons, 2001). Aletris is acquired as a powdered root, a liquid extract, or an infusion (Gruenwald, Brendler, & Jaenicke, 1998). Common dosages range from 0.3–6.6 g three times a day.

Alfalfa has a scientific name of *Medicago sativa*. Consumers use alfalfa as a diuretic or for kidney, bladder, prostate, asthma, arthritis, and diabetes conditions (Facts and Comparisons, 2001). Alfalfa is another herb with estrogenic properties that can interfere with hormone-sensitive cancers (Leung & Foster, 1996). Photosensitivity is a potential adverse effect of this herb (Brown, 1997). Ingestion of large amounts of alfalfa seeds is associated with pancytopenia (Malinow, Bardana, & Goodnight, 1981; Tyler, 1993). Newall, Anderson, and Philp-son (1996) suggested a dosage of 5–10 g steeped and drained as a tea, three times a day. Only aboveground parts of the plant should be used.

Table 1. Herbs and Natural Products With Potential to Increase Cancer Growth, Interfere With Cancer Treatments, or Increase Cancer Recurrence for Patients Who Have or Have Had Cancer: Common and Brand Names

Herb or Natural Product	Brand Name and Manufacturer or Other
Aletris	See Table 2.
Alfalfa	See Table 2.
Androstenedione	See Table 2.
Anise	See Table 2.
Black tea	See Table 2.
Boron	See Table 2.
Chasteberry	See Table 2.
Coenzyme Q-10 Other names: co-enzyme Q10, coenzyme Q10, co-enzyme Q-10, co enzyme Q10, coQ10, co Q 10, co-Q-10, co-Q10, coQ-10, Q10	CDT CoQ10 (Olympian Labs) ^a Co Enzyme Q10 (Jamieson) ^a Coenzyme Q10 (Source Naturals) ^a Anti-Oxidant Formula #1 (Olympian Labs) ^b Blue-Green Connection (HealthWatchers System) ^b Cenzyme Q-10 Fields of Nature (Inverness Medical Innovations, Inc.) ^b Coenzyme Q10 100 mg (Leiner Health Products) ^b 3-Daily (The Vitamin Shoppe) ^b 206 brand names found
Cohosh	
• Black cohosh	See Table 2.
• Blue cohosh	See Table 2.
Deer velvet	See Table 2.
DHEA	See Table 2.
Dong quai	See Table 2.
Fennel	See Table 2.
Flaxseed	See Table 2.
Ginseng	
• American ginseng	See Table 2.
• Panax ginseng	See Table 2.
• Siberian ginseng	See Table 2.
Glucosamine	
• Glucosamine hydrochloride Other names: 2-amino-2-deoxy-beta-D-glucopyranose, amino monosaccharide, chitosamine, glucosamine, glucosamine HCl, glucose-6-phosphate	ArthritiCare (Aarisse Health Care) ^b Arth Rx (Symmetry) ^{b, c} Cosamine 500 mg (Kripps Pharmacy) ^{b, c} G/C 1,000 (Progressive Labs) ^{b, c} Glucopro 900 (Thompson Nutritional Products) ^{b, c} Glucosamine Formula (Symmetry) ^{b, c} Glucosamine Complex (Natrol) ^b Move Free, formerly called Pain Free (Schiff) ^{b, c} 36 brand names found
• Glucosamine sulfate Other names: 2-amino-2-deoxy-beta-D-glucopyranose, amino monosaccharide, chitosamine, D-glucosamine, G6S, glucosamine, glucosamine sulphate, glucose-6-phosphate, glucose-6-sulfate, glucose-6-sulphate, GS, mono-sulfated saccharide, sulfated monosaccharide, sulfated saccharide, sulphated monosaccharide	Glucosamine Sulfate (PhotoPharmica) ^a Glucosamine Sulfate Capsules (PhytoPharmica) ^a Glucosamine Sulfate (Swanson) ^a From the Sea (Puritan's Pride) ^b Glucomine (Body Wise International, Inc.) ^{b, c} Glucosamine Fuel (TwinLab) ^{b, c} Glucosalage SO4 Extra Strength (Olympian Labs) ^b Glucosamine Formula (Symmetry) ^{b, c} 129 brand names found

(Continued on next page)

^a This herb or natural product is the only ingredient in this brand.

^b This brand name is an example of a product in which the herb or natural product is included along with other herbs and products. Monitor for all possible side effects of all ingredients in these products.

^c Safety of this product is a concern. The product contains animal material, possibly diseased animals that may harbor bovine spongiform encephalopathy (i.e., mad cow disease).

Table 1. Herbs and Natural Products With Potential to Increase Cancer Growth, Interfere With Cancer Treatments, or Increase Cancer Recurrence for Patients Who Have or Have Had Cancer: Common and Brand Names (Continued)

Herb or Natural Product	Brand Name and Manufacturer or Other
<ul style="list-style-type: none"> N-acetyl glucosamine Other names: acetylglucosamine, glucosamine N-acetyl, N-acetyl d-glucosamine, N-acetyl-D glucosamine, NAG, N-A-G, poly-NAG 	Arthro-Glucosamine (Nutri-Quest) ^{b, c} Glucosamine Complex (Natrol) ^b Glucosa-Plex (Progressive Labs) ^{b, c} Intestinal Fortitude (Nutri-Quest) ^b Osteo Formula Quest (Pangeo Health Brands, Inc.) ^b XTEND-LIFE Total Balance (Xtend-Life Nutraceuticals Inc.) ^{b, c} 19 brand names found
Hydrazine sulfate Other names: hydrazine, sehydryn	No brand names found. However, an Internet source sells hydrazine sulfate from Abbotsford, Canada.
Kefir Other names: fermented dairy product, fermented milk, kefir cheese, kefir grains, kefir yogurt	Kefir is milk that has been fermented for 18–48 hours following addition of kefir grain. Kefir grain is made up of a mixture of lactic acid bacteria, acetic acid bacteria, and yeast held together in lumps by polysaccharides.
Lactobacillus Other names: acidophilus, L. acidophilus, L. amylovorus, L. brevis, L. bulgaricus, L. casei, L. crispatus, L. delbrueckii, L. fermentum, L. gallinarum, L. johnsonii, LC-1, L. plantarum, L. reuteri, L. sporogenes, LC-1, Laco bacillus, Lactobacilli, Lactobacillus GG, Lactobacillus rhamnosus GG, probiotics	Probiata (Wakunaga of America Co., Ltd.) ^a Acidophilus E.C. (Progressive Labs) ^a Acidophilase (Wakunaga of America Co., Ltd.) ^b Acidophilus Super Strain (Jamieson) ^b Probiotic (Enzymes, Inc.) ^b Probiotica (McNeil Consumer Healthcare) ^b 92 brand names found
<ul style="list-style-type: none"> Yogurt other names: acidophilus milk, Bulgarian yogurt, live culture yogurt, probiotics, yoghurt, yogurt 	VSL #3 (Questcor Pharmaceuticals) ^a Daily 3 Complete (The Vitamin Shoppe) ^b Glycobar: Peanut Butter and Jelly (Pharmanex) ^b Low-Carb Apple Autumn Frost—Revival (Physicians Laboratories) ^b Rhino Actalin Bars (Nutrition Now) ^b Yogurt-Covered Soynuts—Revival (Physicians Laboratories) ^b 6 brand names found <i>Note.</i> The above are products found in health-food stores.
Licorice	See Table 2.
Milk thistle	See Table 2.
Pregnenolone	See Table 2.
Progesterone	See Table 2.
Raspberry leaf	See Table 2.
Red clover	See Table 2.
Resveratrol	See Table 2.
Scarlet pimpernel	See Table 2.
Soy	See Table 2.
Star anise	See Table 2.
Vitamin C Other names: ascorbate, ascorbic acid, antiscorbutic vitamin, calcium ascorbate, cevitamic acid, sodium ascorbate	Vitamin C 1,000 mg (Jamieson) ^a Vitamin C 1,000 mg Time Release (Jamieson) ^a Vitamin C 500 mg Time Release Capsules (Jamieson) ^a Vitamin C Crystals (Puritan's Pride) ^a Vitamin C (Nutraceutical Sciences Institute) ^a Vitamin C 200 mg (The Vitamin Shoppe) ^b Vitamin C (Leiner Health Products) ^b Vitamin C 1,000 mg (Olympian Labs) ^b 1,324 brand names found

(Continued on next page)

^a This herb or natural product is the only ingredient in this brand.

^b This brand name is an example of a product in which the herb or natural product is included along with other herbs and products. Monitor for all possible side effects of all ingredients in these products.

^c Safety of this product is a concern. The product contains animal material, possibly diseased animals that may harbor bovine spongiform encephalopathy (i.e., mad cow disease).

Table 1. Herbs and Natural Products With Potential to Increase Cancer Growth, Interfere With Cancer Treatments, or Increase Cancer Recurrence for Patients Who Have or Have Had Cancer: Common and Brand Names (Continued)

Herb or Natural Product	Brand Name and Manufacturer or Other
<p>Vitamin E Other names: all rac-alpha-tocopherol, d-alpha-tocopherol, d-alpha-tocopheryl acetate, d-alpha-tocopheryl succinate, dl-alpha-tocopherol, di-alpha-tocopheryl, di-alpha-tocopheryl acetate, d-tocopherol, di-tocopherol, d-beta-tocopherol, d-delta-tocopherol, d-gamma-tocopherol, mixed tocopheryl succinate, tocotrienol, tocotrienol concentrate from vitamin E</p>	<p>Vitamin E (Drugstore.com)^a Vitamin E 1,000 IU Basic Nutrition (GNC)^a Vitamin E (Nature's Way)^a Vitamin E 1,000 IU, GNC A-Z (GNC)^a Vitamin E (Health Smart Vitamins)^a Vitamin E 400 IU (Jamieson)^a Vitamin E 800 IU (Leiner Health Products)^a Vitamin E Oil 28,000 IU (Jamieson)^a Vita E Complex (Shaklee)^b Vita E (Shaklee)^b</p> <p>These products contain only vitamin E in soy oil. See text for soy. Vitamin E 100 IU (Jamieson)^a Vitamin E 200 IU (Jamieson)^a Vitamin E (Olympian Labs)^a 1,034 brand names found</p>
Wild yam	See Table 2.

^a This herb or natural product is the only ingredient in this brand.

^b This brand name is an example of a product in which the herb or natural product is included along with other herbs and products. Monitor for all possible side effects of all ingredients in these products.

^c Safety of this product is a concern. The product contains animal material, possibly diseased animals that may harbor bovine spongiform encephalopathy (i.e., mad cow disease).

Androstenedione has a scientific name of *4-androstene-3, 17-dione*. This product has been used to enhance athletic performance by increasing endogenous testosterone. It also has been known to increase energy and keep red blood cells healthy (Natural Medicines Comprehensive Database, 2003). Androstenedione normally is produced by the adrenal glands, testes, and ovaries (Leder et al., 2000) and consistently increases estrogen levels (Broeder et al., 2000; Brown et al., 2000; King et al., 1999; Leder et al.; Rasmussen, Volpi, Gore, & Wolfe, 2000). Women with hormone-sensitive cancers should avoid this product (Brown et al.). Adverse effects of this hormone are different for men and women. In men, it decreases spermatogenesis, acne, and testicular atrophy and increases the risk of pancreatic and prostate cancers (King et al.; van Weerden et al., 1992). In women, androstenedione can cause masculinization, acne, menorrhea, male pattern baldness, and coarseness of skin. Androstenedione also may worsen depression (Weber, Lewicka, Deuschle, Colla, & Heuser, 2000). According to Broeder et al., Brown et al., King et al., and Leder et al., weight trainers using doses of 50–150 mg did not improve their muscle strength or size.

Anise, scientific name *Pimpinella anisum*, is used in self-medication as an antifatulent and expectorant (Facts and Comparisons, 2001). Women with hormone-sensitive cancers should avoid using anise because of its estrogenic properties (Leung & Foster, 1996; Newall et al., 1996). Newall et al. indicated that excessive doses of anise can interfere with anticoagulants, monoamine oxidase inhibitors, and estrogen. This herb is associated with allergic reactions of the skin and the respiratory and gastrointestinal tracts. Anise has been related to photosensitivity and other adverse reactions, including nausea, vomiting, seizures, and pulmonary edema with ingestion of 1–5 ml of anise oil (Newall et al.). Facts and Comparisons reported that bergapten, a component of anise,

has carcinogenic tendencies. A typical dose is 0.5–1 g of dried anise fruit or 50–200 ml of anise oil (Newall et al.). In consideration of the adverse effects, consumers might be wise to revise and lower this dosage or avoid this herb completely. See Table 3 for herbs and natural products with toxic or negative side effects.

Black tea has a scientific name of *Camellia sinensis*, which is synonymous with *Camellia thea*. Black tea is used in self-medication for many ailments. Of particular interest is black tea's use in reducing the risk of gastrointestinal, ovarian, or breast cancer. This herb has estrogenic properties; therefore, women with hormone-sensitive cancers should avoid high doses (Hegarty, May, & Khaw, 2000). Second only to water, tea is the most common beverage in the world (Schulz, Hansel, & Tyler, 1998). Black tea, the most ingested tea, undergoes a fermentation process that causes enzymic changes. Green tea, which comes from the same plant, is prepared directly after harvest, limiting its enzymic changes. Therefore, the chemical constituents in black and green tea are different. Tyler (1993) indicated that one 6 oz cup of black tea contains approximately 10–50 mg of caffeine and suggested no more than four or five cups per day. Some research has reported that caffeine (in tea and other beverages) is associated with fibrocystic breast disease, but this evidence is controversial (McKevoy, 1998; Micromedex Inc., 2002).

Boron, with the same scientific name, is used in self-medication to enhance healthy bones and treat osteoarthritis (Newnham, 1994). Boron is used to build muscle and increase testosterone levels (Green & Ferrando, 1994). Women with hormone-sensitive cancers and conditions should avoid supplemental boron or excessive use of foods known to contain this trace element (Shils, Olson, & Shilke, 1994). Cow's milk and all food of plant origin contain this element in trace amounts (Health and Welfare Canada, 1990). Large doses of

Table 2. Herbs, Natural Products, and Components of Products That Enhance Growth of Hormone-Sensitive Cancers, Such as Breast, Uterine, or Ovarian Cancers: Common and Brand Names

Herb or Natural Product	Brand Name and Manufacturer or Other
<p>Aletris Other names: ague grass, ague root, aloerot, blazing star, colic root, crow corn, devil's-bit, stargrass, starwort, unicorn root, whitetube stargrass</p>	<p>Menopause (Nutrivation)^c 1 brand name found</p>
<p>Alfalfa Other names: feuille de luzerne, Lucerne, Medicago, phytoestrogen, purple medick</p>	<p>Alfalfa (Puritan's Pride)^c Alfalfa Complex (Shaklee)^c 50+ (Futurebiotics)^c Alfalfa Quest (PanGeo Health Brands, Inc.)^c 194 brand names found</p>
<p>Androstenedione^a Other names: andro, androstene</p>	<p>Andro-Stack 850 (Optimum Nutrition)^c Androstenedione With Yohimbe (Puritan's Pride)^c Anotesten (MuscleTech)^c 19-Nor-3-Andro (AST Sports Science)^c Pinnacle Androstat 100 (Bodyonics, Ltd.)^c 25 brand names found</p>
<p>Anise Other names: aniseed, anisi fructus, phytoestrogen, semen anisi, sweet cumin</p>	<p>Bitter Virtue (Blessed Herbs)^c Enzymes (Nutrivation)^{c, d} Menopause Nutritional System 2 (Schiff)^c Mother's Milk (Traditional Medicinals)^c 35 brand names found</p>
<p>Black tea Other names: Chinese tea, tea</p>	<p>EB5 Body Formula (Pharmacist Heldfond's eb5 Formulas for Younger Looking Skin)^c Guarana Chai (Traditional Medicinals)^c Red Wine Formula (Health Smart Vitamins)^c Thermojetics Herbal Concentrate (Herbalife)^c <i>Note.</i> Some of the above are in capsule form, and others are in tea packages for brewing. 10 brands for medicinal use found</p>
<p>Boron</p>	<p>Centrum (Wyeth)^c (has 150 mcg of potassium borate in comparison to most other products with 3 mcg or 3 mg of boron) #120 CAL Calcium Plus (Systemic Formulas)^c 30 Day Beauty Secret (Futurebiotics)^c Breast Health Formula (Great American Nutrition)^c XTEND-LIFE Total Balance (Xtend-Life Nutraceuticals Inc.)^{c, d} 246 brand names found</p>
<p>Chasteberry Other names: Agnolyt, agnus castus, agnus-castus, chaste berry, chaste tree, chaste tree berry, castetree, gattilier, hemp tree, monk's pepper, vitex, vitex agnus castus</p>	<p>Vitex (Puritan's Pride)^b Vitex Chaste Berry (Jamieson)^b Chaste Tree MediHerb (Standard Process, Inc.)^c Femfocus Herbal Female Complex (Solgar)^c Chaste Tree Siberian Ginseng Virtue (Blessed Herbs)^c Zotin (AlphaGen Biotech)^c 71 brand names found</p>
<p>Cohosh</p>	<p>Amazon Menopause Support (Raintree Nutrition, Inc.)^c Black Cohosh (Jamieson)^b Black Cohosh (Leiner Health Products)^c Black Cohosh (Nature's Way)^c Concentrated Black Cohosh, GNC Herbal Plus (GNC)^c Daily Balance Hot Flash (Doctor's Preferred, Inc.)^c Hot Flashex (Natrol)^c 140 brand names found</p>

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^a Androstenedione is a product banned by the International Olympics Committee, National Collegiate Athletic Association, National Basketball Association, National Football League, and World Natural Body Building Federation ("NBA Bans Androstenedione," 2000; Pheatt, 1999).

^b This herb or natural product is the only ingredient in this brand.

^c This brand name is an example of a product in which the herb or natural product is included along with other herbs and products. Monitor for all possible side effects of all ingredients in these products.

^d Safety of this product is a concern. The product contains animal material, possibly diseased animals that may harbor bovine spongiform encephalopathy (i.e., mad cow disease).

Table 2. Herbs, Natural Products, and Components of Products That Enhance Growth of Hormone-Sensitive Cancers, Such as Breast, Uterine, or Ovarian Cancers: Common and Brand Names (Continued)

Herb or Natural Product	Brand Names and Manufacturer or Other
<ul style="list-style-type: none"> Blue cohosh Other names: blue ginseng, Caulophyllum, papoose root, squaw root, yellow ginseng 	Alertis Compound (The Herbalist) ^c Black Cohosh-Blue Cohosh Virtue (Blessed Herbs) ^c Monthly Comfort (Source Naturals) ^c Natural Quit (JBS Natural Products) ^c 15 brand names found
<p>Deer velvet Other names: Cornu cervi parvum, deer antler, deer antler velvet, horns of gold, lu rong, nokyong, rokujo, velvet antler, velvet of young deer horn</p>	Brave Hart Deer Velvet Capsules (Hart Products) ^b Male Power (Futurebiotics) ^{c, d} Male Drive (Dial Herbs) ^c Super Nutrition Power (Mascot Enterprise) ^{c, d} 4 brand names found
<p>DHEA Other names: dehydroepiandrosterone, GL 701, prasterone</p>	7-Keto (Enzymatic Therapy/PhytoPharmica) ^b DHEA 50 mg (Olympian Labs) ^b DHEA (Leiner Health Products) ^c DHEA Ultra (Free Life International) ^c Andro-Xtreme (New Hope Health Products) ^c 39 brand names found
<p>Dong quai</p>	Dong Quai (Olympian Labs) ^b Dong Quai Extract (Montana Naturals, Inc.) ^b Dong Quai Extract in Vegetable Glycerin (Nature's Herbs) ^b Dong Quai Fingerprint Botanicals (GNC) ^b Dong Quai Root, GNC Herbal Plus (GNC) ^b Dong Quai (Leiner Health Products) ^c Dong Quai (Nature's Way) ^c Hot Mommies Essential 3 (Changes International, Inc.) ^c 136 brand names found
<p>Fennel Other names: bitter fennel, carosella, common fennel, finnochio, Florence fennel, garden fennel, large fennel, phytoestrogen, sweet fennel, wild fennel</p>	Bone Builder (Schiff) ^c Catnip and Fennel (Dial Herbs) ^c Detox Formula (Gary Nulls) ^c GBLVR (Nutri-Quest) ^c Female Sage (Traditional Medicinals) ^c Fennel-Yam (Atrium Inc.) ^c 104 brand names found
<p>Flaxseed Other names: fax seed, graine de lin, leinsamen, lini semen, linseed, lint bells, linum, phytoestrogen, winterlien</p>	Female Advantage (Body Wise International, Inc.) ^c Golden Flax Meal (Nature's Life) ^c Male Advantage (Body Wise International, Inc.) ^c Complete Cleanse (PhysioLogics) ^c 59 brand names found
<p>Ginseng</p> <ul style="list-style-type: none"> American ginseng Other names: Anchi ginseng, Canadian ginseng, ginseng, North American ginseng, Ontario ginseng, red berry, ren shen, sang, tienchi ginseng, Wisconsin ginseng Panax ginseng Other names: Asian ginseng, Asiatic ginseng, Chinese ginseng, ginseng, ginseng Asiatique, ginseng radix, ginseng root, Japanese ginseng, Jintsam, Korean ginseng, Korean panax, ginseng Korean red, Korean red ginseng, ninjin, Oriental ginseng, red ginseng, ren shen, sang, seng 	American Ginseng (Nature's Way) ^c American Ginzeng (Traditional Medicinals) ^c Canadian Ginseng (Jamieson) ^c PMS Forte (Futurebiotics) ^c 2nd Wind (Sports Nutrition Source, Inc.) ^c 132 brand names found Ginseng Extract (The Vitamin Shoppe) ^b Ginseng-Go! (Wakunaga of America Co., Ltd.) ^b Ginseng (Source Naturals) ^b Ginsana (PanGeo Health Brands, Inc.) ^c Ginseng Complex (Puritan's Pride) ^c Ginseng Energy (Celestial Seasonings) ^c

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^b This herb or natural product is the only ingredient in this brand.

^c This brand name is an example of a product in which the herb or natural product is included along with other herbs and products. Monitor for all possible side effects of all ingredients in these products.

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Table 2. Herbs, Natural Products, and Components of Products That Enhance Growth of Hormone-Sensitive Cancers, Such as Breast, Uterine, or Ovarian Cancers: Common and Brand Names (Continued)

Herb or Natural Product	Brand Names and Manufacturer or Other
<ul style="list-style-type: none"> <i>Panax ginseng continued</i> 	Ginseng (Leiner Health Products) ^c Ginseng Phytosome (PhytoPharmica) ^c Red Dragon Imperial Ginseng (Jamieson) ^c 2nd Wind (Resource Wellness) ^c Vigor-Max (Shenlong Natural International, Inc.) ^c (A drug similar to sildenafil citrate has been found in this product. Health Canada [2002] advised the public not to use this product.) 282 brand names found
<ul style="list-style-type: none"> Siberian ginseng Other names: ci wu jia, ciwujia, devil's bush, devil's shrub, eleuthera, eleuthero, Eleuthero ginseng, Eleutherococ, Eleutherococc, Eleutherococci radix, Eleutherococcus, ginseng, phytoestrogen, prickly Eleutherococ, Russian root, Shigoka, thorny bearer of free berries, touch-me-not, untouchable, Ussuri, Ussurian thorny pepperbush, wild pepper, wu jia pi, wu-jia 	Siberian Ginseng (Gaia Herbs) ^b Siberian Ginseng (Olympian Labs) ^b Siberian Ginseng Quest (PanGeo Health Brands, Inc.) ^b Siberian Ginseng Extract (PhytoPharmica) ^b Aqueous Liver Extract With Siberian Ginseng (PhytoPharmica) ^{c, d} Ginseng Complex (Puritan's Pride) ^c Ginseng (Leiner Health Products) ^c Ginseng Energy (Celestial Seasonings) ^c Olympian Energy (Olympian Labs) ^c Panax Ginseng (Pharmanex) ^c Siberian Ginseng (Nature's Way) ^c Siberian Ginseng (Pharmanex) ^c 355 brand names found
<p>Licorice Other names: alcaucus, alcazuz, Chinese licorice, gan cao, gan zao, glycyrrhiza, isoflavones, lakritze, licorice root, liquiritiae radix, liquirizia, liquorice, orozuz, phytoestrogen, reglisse, regliz, Russian licorice, Spanish licorice, subholz, sweet root</p>	Licorice (Nature's Way) ^b 7 Day Smoke Away Lung Saver (The Quit Smoking Co.) ^c (homeopathic product) #14 COLON (Systemic Formulas) ^c Flash Fighters (Puritan's Pride) ^c GastroSoothe (Enzymatic Therapy) ^c Licorice Garlic (Atrium Inc.) ^c Respiratory Support Formula (PhysioLogics) ^c Women's PM Multi (Clinician's Choice) ^c Women's Guardian (Clinician's Choice) ^c 342 brand names found
<p>Milk thistle Other names: Cardui mariae fructus, Cardui mariae herba, holy thistle, lady's thistle, Legalon, Marian thistle, Mariendistel, Mary thistle, milk thistle above ground parts, milk thistle fruit, milk thistle seed, our lady's thistle, St. Mary thistle, silybin, Silybum, silymarin (This is not the same as blessed thistle.)</p>	Milk Thistle (BioDynamax) ^b Milk Thistle (Jamieson) ^b Milk Thistle Extract (Nutraceutical Sciences Institute) ^b Milk Thistle Seed (Gaia Herbs) ^b Milk Thistle Basic Nutrition (GNC) ^c Milk Thistle (Pharmanex) ^c Milk Thistle (Leiner Health Products) ^c XTEND-LIFE Total Balance (Xtend-Life Nutraceuticals Inc.) ^{c, d} 134 brand names found
<p>Pregnenolone No other names except above. Pregnenolone is the precursor for all steroid hormones in the body, including estrogen and progesterone. Pregnenolone is produced in the body from cholesterol.</p>	Pregnenolone (Metabolic Response Modifiers) ^b Pregnenolone-15 (PhytoPharmica) ^b ArthritiCare (Aarisse Health Care) ^c Brain Lightning (Novus Research) ^c Intimate Response (Source Naturals) ^c Youth-Assure (Nature's Plus) ^{c, d} 12 brand names found
<p>Progesterone Other names: corpus luteum hormone, luteal hormone, luteohormone, lutine, N SC-9704, pregnancy hormone, pregnanedione, progestational hormone, progesteronum</p>	Emerita (Transitions for Health, Inc.) ^c Her Stuff (Blue Stuff, Inc.) ^c Testatropinol (Advanced Sports Nutrition) ^c (homeopathic product) Progensa (Life-Flo) ^c 14 brand names found

(Continued on next page)

^a Androstenedione is a product banned by the International Olympics Committee, National Collegiate Athletic Association, National Basketball Association, National Football League, and World Natural Body Building Federation ("NBA Bans Androstenedione," 2000; Pheatt, 1999).

^b This herb or natural product is the only ingredient in this brand.

^c This brand name is an example of a product in which the herb or natural product is included along with other herbs and products. Monitor for all possible side effects of all ingredients in these products.

^d Safety of this product is a concern. The product contains animal material, possibly diseased animals that may harbor bovine spongiform encephalopathy (i.e., mad cow disease).

Table 2. Herbs, Natural Products, and Components of Products That Enhance Growth of Hormone-Sensitive Cancers, Such as Breast, Uterine, or Ovarian Cancers: Common and Brand Names (Continued)

Herb or Natural Product	Brand Names and Manufacturer or Other
Raspberry leaf Other names: red raspberry, Rubi idaei folium, rubus	Fem-Mend Formula (Nature's Way) ^c Menopause Formula (Natrol) ^c Purist Cleanse (Abbott Industries) ^c Raspberry (Natrol) ^c Raspberry Drinkable Yogurt (Stonyfield Farm) ^c T-DREA (Dial Herbs) ^c 74 brand names found
Red clover Other names: beebread, cow clover, daidzein, genistein, isoflavones, meadow clover, phytoestrogen, purple clover, trefoil, trifolium, wild clover	Red Clover (Nature's Way) ^b Red Clover Extract (Source Naturals) ^c Red Clover Combination (Nature's Way) ^c Chaparral and Red Clover (Dial Herbs) ^c FEMFOCUS Red Clover (Solgar) ^c #481 OXAA Cell Organizer (Systemic Formulas) ^c Hoxsey Formula (The Herbalist) ^c 113 brand names found
Resveratrol Other names: cis-resveratrol, kojo-kon, phytoestrogen, trans-resveratrol	Resveratrol is found in red wine, red grape skins, purple grape juice, mulberries, and small amounts in peanuts. Actilife Super Antioxidant (Crystal Springs) ^c Red Wine Formula (Health Smart Vitamins) ^c Protykin/Resveratrol (Natrol) ^c 8 brand names found
Scarlet pimpernel Other names: adder's eyes, phytoestrogen, poor man's weatherglass, red chickweed, red pimpernel, shepherd's barometer	No brand names found. Therefore, expect that patients using this herb will be identifying it in the wild and using the dried plant to prepare tea.
Soy Other names: daidzein, edamame, frijol de soya, genistein, haba soy, hydrolyzed soy protein, isoflavone, isoflavones, legume, miso, natto, phytoestrogen, plant estrogen, shoyu, soja, sojabohne, soy fiber, soy milk, soy protein, soy protein extract, soy-protein, soya, soybean, soybean curd, tempeh, texturized vegetable protein, tofu	Soy Extract (PhytoPharmica) ^b Cayenne (Now) ^c Soy Essentials (Health From the Sun) ^c Soy Preventive (GNC) ^c 362 brand names found
Star anise Other names: aniseed stars, Anisi stellati fructus, badiana, Chinese anise, Chinese star anise, eight-horned anise, eight horns, illicium	Everyday Detox (Traditional Medicinals) ^c Weightless Cinnamon-Spice (Traditional Medicinals) ^c 2 brand names found
Wild yam Other names: Atlantic yam, barbasco, China root, devil's bones, Mexican yam, natural DHEA, phytoestrogen, rheumatism root, wild Mexican yam, yuma	Wild Yam Root (Nature's Bounty) ^c Wild Yam (Alvin Last) ^c Wild Yam Extract (PhytoPharmica) ^c Female Balance (Olympia Nutrition) ^c Menopause (Nutrivention) ^c 102 brand names found

^a Androstenedione is a product banned by the International Olympics Committee, National Collegiate Athletic Association, National Basketball Association, National Football League, and World Natural Body Building Federation ("NBA Bans Androstenedione," 2000; Pheatt, 1999).

^b This herb or natural product is the only ingredient in this brand.

^c This brand name is an example of a product in which the herb or natural product is included along with other herbs and products. Monitor for all possible side effects of all ingredients in these products.

^d Safety of this product is a concern. The product contains animal material, possibly diseased animals that may harbor bovine spongiform encephalopathy (i.e., mad cow disease).

boron can cause poisoning, with nausea, vomiting, diarrhea, epigastric pain, hematemesis, discolored feces, and blue- to green-colored vomit (Ellenhorn & Barceloux, 1997). A diet high in boron consists of 3.25 mg of boron per 2,000 kcal per day, whereas a diet low in boron consists of 0.25 mg of boron per 2,000 kcal per day (Penland, 1994). A safe dietary limit is 10 mg per day (Shils et al.). Individuals who eat a regular North American diet (Office of Nutrition Policy and Promotion, 2004; U.S. Department of Agriculture, 1995) should not be concerned about boron.

Chasteberry has a scientific name of *Vitex agnus-castus*. Chasteberry is used to self-medicate for symptoms associated with menstrual and menopausal conditions. Consumers also use chasteberry for acne, female infertility, fibrocystic breasts, and miscarriage prevention. Daily doses of 120 mg of chasteberry can diminish the release of follicle-stimulating hormone and increase luteinizing hormone, which, in turn, decreases the body's estrogen levels and increases progesterone and prolactin levels (Brown, 1994; Merz et al., 1996; Mills & Bone, 2000; Newall et al., 1996). Women with hormone-sensitive cancers

Table 3. Herbs or Natural Products That Have Toxic or Negative Side Effects Along With Properties to Enhance the Growth of Cancer

Herb or Natural Product	Major Adverse Reaction or Toxicity
Anise	Nausea, vomiting, seizures, and pulmonary edema can be caused by ingestion of 1–5 ml of anise in oil.
Blue cohosh	Poisoning has resulted from ingestion of leaves and seeds.
Boron	Acute poisoning can result from ingestion of doses of more than 10 mg per day.
DHEA	Adverse effects include acne, hair loss, hirsutism, voice deepening, insulin resistance, changes in menstrual pattern, hepatic dysfunction, abdominal pain, and hypertension.
Flaxseed	When doses greater than 45 g per day are combined with inadequate fluid intake, intestinal blockage is possible.
Hydrazine sulfate	Regular use can cause irregular breathing, confusion, hypoglycemia, hyperglycemia, lethargy, violent behavior, restlessness, seizures, coma, renal toxicity, and hepatotoxicity.
Licorice	Chronic consumption can cause a variety of symptoms, including lethargy, headache, edema, congestive heart failure, lower extremity weakness, hypertensive encephalopathy, and quadriplegia.
Panax ginseng	Adverse effects include insomnia, mastalgia, vaginal bleeding, tachycardia, and mania.
Pregnenolone	Overuse side effects are insomnia, irritability, anger, anxiety, acne, headache, negative mood changes, facial hair growth, and hair loss.
Red clover	This herb interacts with anticoagulant drugs and herbs, leading to a risk of hemorrhage.
Vitamin C	Regular and high doses of vitamin C are associated with deep vein thrombosis.
Vitamin E	This vitamin interacts with anticoagulant and antiplatelet drugs and herbs, resulting in a risk of hemorrhage.

should avoid chasteberry because of its effects on estrogen levels (Eagon, Elm, & Hunter, 2000). Side effects for this herb are relatively rare, but minor changes in menstrual flow can result from chasteberry ingestion (McCaleb, Leigh, & Morien, 2000; Newall et al.). Typically, crude herb extracts are taken in doses of 20–240 mg per day (Mills & Bone).

Coenzyme Q-10 has scientific names of *ubiquinone*, *ubidecarenone*, and *mitoquinone*. Patients with cancer use coenzyme Q-10 to prevent cardiotoxicity related to doxorubicin chemotherapy, and some patients with breast cancer also self-prescribe this product. The human body produces coenzyme Q-10 naturally, but preliminary evidence has shown that concentrations of this enzyme are lower in cancerous breast tissue than in healthy tissue, leading researchers to speculate that very low levels may indicate poor prognosis (Jolliet et al., 1998; Portakal et al., 2000). Researchers are concerned that ingesting antioxidants such as coenzyme Q-10 may interfere with chemotherapeutic agents, but this effect has not been verified. Researchers have speculated that coenzyme Q-10, when used concomitantly with alkylating agents such as cyclophosphamide, protects cancer cells from the chemotherapy agent (Lund, Quistorff, Spang-Thomsen, & Kristjansen, 1998;

Permanetter et al., 1992; Portakal et al.). Clinical studies have demonstrated no other significant adverse reactions (Langsjoen, Langsjoen, & Folkers, 1990). Micromedex Inc. (2002) indicated that 50 mg per day has been used for treating cardiotoxicity related to doxorubicin chemotherapy treatment.

Cohosh comes in two colors, black and blue. Black cohosh has a scientific name of *Cimicifuga racemosa*, and blue cohosh has a scientific name of *Caulophyllum thalictroides*. Both are used as natural hormone replacement therapy. Tyler (1993) noted the self-medication of these herbs for inducing menstruation, for stimulating the uterus, and as a laxative. Black cohosh is used to manage menopause symptoms such as hot flashes. Although laboratory tests have shown that black cohosh does not stimulate proliferation of estrogen receptor-positive breast cancer cells (Foster, 1999; Gruenwald, 1998; Liske, 1998), large-scale epidemiologic studies have not been performed on humans (Natural Medicines Comprehensive Database, 2003). Both blue and black cohosh have estrogenic properties; therefore, Eagon et al. (2000) reported that women with hormone-sensitive cancers should avoid these herbs. In addition, black cohosh may interfere with tamoxifen (Natural Medicines Comprehensive Database).

Common adverse effects of black cohosh are gastrointestinal disturbances (Liske, 1998; Pepping, 1999), headache (Eagon et al., 2000), heaviness in the legs, and weight gain (Gruenwald, 1998). High doses cause nausea, vomiting, dizziness, nervous system and visual disturbances, perspiration, and reduced heart rate (Newall et al., 1996). Most studies reported using a dose of 40–80 mg twice daily, which is much lower than the 300–2,000 mg that manufacturers recommend (Natural Medicines Comprehensive Database, 2003).

Blue cohosh can irritate gastrointestinal conditions (Newall et al., 1996). Although the typical dose of a dried rhizome or root is 0.3–1 g or tea taken three times daily, self-medication with this herb is considered unsafe because of potential poisoning from leaves and seeds (Newall et al.; Tyler, 1993).

Deer velvet has scientific names of *Cervus nippon* and *Cervus elaphus*. Individuals use deer velvet for what they believe are its anticancer and anti-inflammatory properties (Natural Medicines Comprehensive Database, 2003). Women with hormone-sensitive cancers should avoid deer velvet because of its estrogenic properties (Huang, 1999). Reliable information is insufficient about the safety, effectiveness, or adverse reactions of deer velvet. A typical dose of powdered deer velvet is 400–600 mg (Natural Medicines Comprehensive Database).

DHEA has a scientific name of *dehydroepiandrosterone*. People use DHEA believing it will prevent heart disease, breast cancer, and diabetes (Kuritzky, 1998; Skolnick, 1996). DHEA is involved in the metabolism of androstenedione, the major human precursor to androgens and estrogens (Oelkers, 1999; van Vollenhoven, 2000); therefore, women with hormone-sensitive cancers should avoid this product. DHEA is produced from wild yam extract. Although the medicinal component of wild yam is converted to DHEA in laboratories, when wild yam extract is ingested, the body cannot accomplish this conversion. Therefore, ingestion of wild yam is not the same as ingestion of DHEA (Skolnick). Products labeled “natural DHEA” are, in fact, wild yam and do not contain DHEA (Natural Medicines Comprehensive Database, 2003). Adverse effects of DHEA include acne, hair loss, hirsutism, voice deepening, insulin resistance, changes in menstrual pattern, hepatic dysfunction,

abdominal pain, and hypertension (“Dehydroepiandrosterone [DHEA],” 1996; Kroboth, Salek, Pittenger, Fabian, & Frye, 1999; Kuritzky). A typical dose ranges from 20–200 mg (Natural Medicines Comprehensive Database).

Dong quai has the scientific name of *Angelica sinensis*, which is synonymous with *Angelica polymorpha sinensis*. People self-medicate with dong quai for gynecologic symptoms of menstrual or menopausal disorders. Some believe dong quai is a blood purifier (Natural Medicines Comprehensive Database, 2003). The estrogenic effect of dong quai indicates that women with hormone-sensitive cancers should avoid this herb (Eagon et al., 2000). This herb is potentially carcinogenic and mutagenic (Facts and Comparisons, 2001). It also can cause photosensitivity and photodermatitis. Suppliers have suggested three daily doses of 520 mg for individuals weighing less than 100 pounds, 1,040 mg for patients ranging from 100–175 pounds, and 1,560 mg for patients weighing more than 175 pounds (Natural Medicines Comprehensive Database). These are neither recommended nor known safe doses.

Fennel has a scientific name of *Foeniculum vulgare*, which is synonymous with *Foeniculum officinale*. Fennel is used in self-medication for initiating menstruation (Facts and Comparisons, 2001) and managing respiratory and gastrointestinal problems (Blumenthal et al., 1998). Estrogenic effects of this herb may interfere with hormone-sensitive cancers (Leung & Foster, 1996). Although a fennel constituent, estrogole, is a procarcinogen, the risk of its inducing cancer is minimal. Estrogole requires activation by the liver enzymes to reach toxicity, and liver enzymes are capable of inactivating carcinogenic metabolites, thus protecting the liver (McGuffin et al., 1997). Individuals using fennel should avoid excessive sunlight or ultraviolet light exposure because of its photodermatitis potential (Brinker, 1998). Cross-sensitivity is possible for people who are allergic to other Apiaceae family plants such as carrot, celery, or mugwort (Gruenwald et al., 1998). A typical dose is 5–7 g of dried fruit or seed or one cup of tea three times daily (Blumenthal et al., 1998; Gruenwald et al.).

Flaxseed has a scientific name of *Linum usitatissimum*. Individuals use flaxseed for numerous conditions, such as constipation or bladder inflammations, but they also use it to protect against cancer (Haggans et al., 1999; Lampe, Martini, Kurzer, Adlercreutz, & Slavin, 1994). The antiestrogen effect, caused by flaxseed lignans competing for estrogen receptors, may inhibit the growth of hormone-dependent cancer cells (Lampe et al.). Furthermore, using flaxseed may protect postmenopausal women against breast cancer because it increases urinary excretion of estrogen metabolites (Haggans et al.). On the other hand, estrogenic effects of flaxseed contraindicate its use by women who have hormone-sensitive cancers. Flaxseed may impair absorption of all oral drugs (Brinker, 1998). When inadequate fluids are consumed with flaxseed, intestinal blockage is possible (Gruenwald et al., 1998). This also may occur with doses greater than 45 g per day. A typical dose is one tablespoon of whole or bruised seed with 6 oz of fluid, two to three times a day (Blumenthal et al., 1998; McGuffin et al., 1997).

Ginseng is the common name for three important species of herbs, but many use it without recognition or concern about the differences among the plants. The three species of ginseng are American ginseng (scientific name: *Panax quinquefolius*), Panax ginseng (scientific name: *Panax ginseng*, synonymous with *Panax schinseng*), and Siberian ginseng (scientific name: *Eleutherococcus senticosus*, synonymous with *Acanthopanax*

senticosus). All three ginseng species are used as self-medication for conditions such as atherosclerosis, blood and bleeding disorders, cancer, colitis, rheumatism, and memory loss (Leung & Foster, 1996; Newall et al., 1996; Robbers, Speedie, & Tyler, 1996). Patients on chemotherapy may take Siberian ginseng to reduce what they perceive is the toxicity of treatment.

Differences and similarities exist among the three types of ginseng. In studies of female rats whose ovaries were removed, Siberian ginseng increased serum ceruloplasmin oxidase activity (i.e., a measurement of estrogenic activity in the liver). Duda et al. (1999) found that extracts from American ginseng may reduce breast cancer growth and may be useful when taken with some anticancer drugs. Conversely, American, Panax, and Siberian ginseng all have estrogenic effects; therefore, women with hormone-sensitive cancers should avoid these herbs (Eagon et al., 2000).

American ginseng can lower blood sugar, thereby interfering with antidiabetic drugs (Vuksan, Sievenpiper, et al., 2000; Vuksan, Stavro, et al., 2000). For patients on warfarin therapy, American, Panax, and Siberian ginseng can potentiate the anticoagulant effects (Brinker, 1998; Cheng, 2000; Janetzky & Morreale, 1997; Newall et al., 1996; Sotaniemi, Haapakoski, & Rautio, 1995). Concomitant use of the ginsengs with other herbs with anticoagulant-antiplatelet properties (e.g., angelica, anise, chamomile, cloves, feverfew, garlic, ginkgo, licorice, red clover, willow) should be avoided (Brinker; Newall et al.). Adverse effects of Panax ginseng include insomnia (Hopkins, Androff, & Benninghoff, 1988), mastalgia (Palmer, Montgomery, & Monteiro, 1978), vaginal bleeding (Greenspan, 1983; Hopkins et al.), tachycardia (Schulz et al., 1998), and mania (Natural Medicines Comprehensive Database, 2003). Apart from anticoagulant-antiplatelet properties, adverse effects for American and Siberian ginsengs are rare (Natural Medicines Comprehensive Database).

According to the Natural Medicines Comprehensive Database (2003), a safe dose of American ginseng is 0.25–0.5 g for young, healthy adults or 0.4–0.8 g for older adults and debilitated individuals. For Panax ginseng, the usual dose is 0.6–3 g of cut or powdered root taken one to three times daily. Tea bags typically contain 1,500 mg of Panax ginseng root and are consumed three to four times daily (Facts and Comparisons, 2001; McGuffin et al., 1997). A typical dose for the dry root of Siberian ginseng is 0.6–3 g daily for up to one month (Newall et al., 1996).

Glucosamine is another natural product that consumers use in self-medication without considering that the name refers to three distinct products. These products are glucosamine hydrochloride (scientific name: *2-amino-2-deoxyglucose hydrochloride*), glucosamine sulfate (scientific name: *2-amino-2-deoxyglucose sulfate*), and N-acetyl glucosamine (scientific name: *2-acetamido-2-deoxyglucose*). All three products usually are self-prescribed for osteoarthritis and sometimes weight loss (Natural Medicines Comprehensive Database, 2003). N-acetyl glucosamine also is used in self-medication for inflammatory bowel disease (i.e., ulcerative colitis or Crohn’s disease) (Natural Medicines Comprehensive Database).

Yun, Tomida, Nagata, and Tsuruo’s (1995) findings indicate that glucosamine hydrochloride, glucosamine sulfate, and N-acetyl glucosamine induce resistance to etoposide and doxorubicin by reducing inhibition of topoisomerase II (an enzyme needed for DNA replication in tumor cells). This induced

resistance occurred in colon, human ovarian, and breast cancer cells. Therefore, patients on chemotherapy agents should avoid all glucosamine products. Typical doses of glucosamine hydrochloride in self-prescription are 1–2 g daily (Natural Medicines Comprehensive Database, 2003). For glucosamine sulfate and N-acetyl glucosamine, the typical dose is 1,500 mg (Drovanti, Bignamini, & Rovati, 1980; Lopes Vaz, 1982).

Hydrazine sulfate has no scientific name. Patients with cancer may use hydrazine sulfate to treat the general weight loss and wasting associated with cancer (Loprinzi, Goldberg, & Burnham, 1992; Micromedex Inc., 2002). Hydrazine sulfate is an organic compound, a sulfate salt that inhibits phosphoenolpyruvate kinase, an enzyme involved in gluconeogenesis. Researchers believe that gluconeogenesis may be partially responsible for cachexia (Loprinzi et al.). Chlebowski et al. (1987) found that people with diverse cancers who were treated with varied chemotherapy regimens and prone to cachexia might gain weight when using hydrazine sulfate. However, hydrazine sulfate was associated with poorer quality of life for patients with non-small cell lung cancer, especially those being treated concomitantly with cisplatin or vinblastine (Kosty et al., 1994). Adverse effects recorded for hydrazine sulfate include nausea, vomiting, dizziness, drowsiness, peripheral neuropathies (Kaegi, 1998), weakness, irregular breathing, confusion, hypo- or hyperglycemia, lethargy, violent behavior, restlessness, seizures, coma, renal toxicity, and hepatotoxicity (Micromedex Inc.). A typical dose for cachectic patients undergoing chemotherapy for cancer is 60 mg three times daily for 30–45 days, followed by a break of two to six weeks (Chlebowski et al.; Kaegi).

Kefir has no scientific name but is found in fermented dairy products. The Natural Medicines Comprehensive Database (2003) reported that self-medication with kefir is for improving digestion, hyperlipidemia, and lactose intolerance. Kefir contains growing bacteria and yeast (De Vrese, Keller, & Barth, 1992; Murofushi, Mizuguchi, Aibara, & Matuhasi, 1986; Rimada & Abraham, 2001; Shiomi, Sasaki, Murofushi, & Aibara, 1982); therefore, patients receiving chemotherapy such as cisplatin, fluorouracil, cyclophosphamide, and other agents that suppress the immune system should avoid kefir. Oral doses of 125–500 ml have been used daily for up to six months (Agerbaek, Gerdes, & Richelsen, 1995; Richelsen, Kristensen, & Pedersen, 1996; Schaafsma, Meuling, van Dokkum, & Bouley, 1998).

Lactobacillus has numerous scientific names, including *Lactobacillus acidophilus*, *Lactobacillus brevis*, *Lactobacillus bulgaricus*, *Lactobacillus casei* sp. *rhamnosus*, *Lactobacillus delbrueckii*, *Lactobacillus fermentum*, *Lactobacillus plantarum*, and *Lactobacillus rhamnosus*. Self-medication with lactobacillus is for diarrhea or digestive and irritable bowel conditions or for preventing cancer and stimulating the immune system (Natural Medicines Comprehensive Database, 2003). Lactobacillus, a group of lactic acid-producing bacteria found in the normal flora of human gastrointestinal and genitourinary tracts, may protect against cancer. In animal models, lactobacillus has shown a tendency to bind dietary carcinogens (El-Nezami, Kankaanpaa, Salminen, & Ahokas, 1998) and has decreased colon tumor growth (Goldin, Gualtieri, & Moore, 1996; McIntosh, Royle, & Playne, 1999). Lactobacillus usually is well tolerated when taken orally or inserted intravaginally (McKevo, 1998). For healthy patients with intact immune systems, pathogenic colonization of lactobacillus has not been reported

(Goldin, 1998; Kalima, Masterton, Roddie, & Thomas, 1996; Saxelin et al., 1996; Tynkkynen, Singh, & Varmanen, 1998). However, patients taking immunosuppressant drugs and some chemotherapy agents, such as cyclophosphamide and cisplatin, should avoid this product (Goldin; Kalima et al.; Saxelin et al.). Typical oral doses range from 1–10 billion viable organisms daily (Fetrow & Avila, 1999). Yogurt is a natural product containing lactobacillus. Eaten as a food and chosen as an alternative to cow's milk products (Pelto, Isolauri, Lilius, Nuutila, & Salminen, 1998), yogurt also is used to self-medicate for numerous gastrointestinal disorders and to reduce colorectal cancer. Yogurt is one of the lactobacillus products with properties that interfere with immunosuppressive therapies and cancer chemotherapy, as tested by Goldin, Kalima et al., and Saxelin et al. Typical doses for yogurt range from 125–450 ml daily (Natural Medicines Comprehensive Database).

The Natural Medicines Comprehensive Database (2003) warned that some lactobacillus products contain little or no *Lactobacillus acidophilus* even though they are labeled with this name. Products also may contain different strains of lactobacillus or be contaminated with other bacteria (Facts and Comparisons, 2001).

Licorice has a scientific name of *Glycyrrhiza glabra*. Patients self-medicate with licorice for upper respiratory tract and gastrointestinal conditions (Blumenthal et al., 1998). In vitro, licorice extract enhances binding of estradiol to estrogen receptors. This, in turn, enhances the estradiol-induced transcription activity in estrogen-responsive cells. Then, according to studies that have measured the liver of rats with ovaries removed, serum ceruloplasmin oxidase activity increases (Natural Medicines Comprehensive Database, 2003). These estrogenic effects suggest that women with hormone-sensitive cancers should avoid this herb. Fifty grams per day or chronic use up to six weeks can cause pseudoaldosteronism with symptoms that include hypertension, lethargy, headache, and sodium and water retention. This can lead to other symptoms such as hypokalemia, heart failure, pulmonary edema, and quadriplegia (Blumenthal et al., 1998; Facts and Comparisons, 2001; Foster & Tyler, 1999; Newall et al., 1996; Sigurdsson, Ragnarsson, Franzson, & Sigurdsson, 1995; Tyler, 1994). Excessive and chronic use should be avoided because of its potential toxicity. One brand-named licorice is a homeopathic product. As mentioned in Part I of this series (Montbriand, 2004), homeopathic products have been through many dilutions with water or another liquid. Most homeopathic products have little or no active ingredients and therefore no pharmacologic effects, drug interactions, or toxic effects.

Milk thistle has a scientific name of *Silybum marianum*, which is synonymous with *Carduus marianum*. Individuals self-medicate with milk thistle for gastrointestinal and hepatic conditions in addition to prostate cancer and numerous other ailments (Natural Medicines Comprehensive Database, 2003). Parts of milk thistle enhance estradiol binding to estrogen receptors. This activity enhances the estradiol-induced transcription activity in estrogen-responsive cells. Therefore, milk thistle is another herb that women with hormone-sensitive cancers should avoid (Eagon et al., 2000). Milk thistle has an antiproliferative effect on androgen-responsive prostate cancer cells (Zhu, Zhang, & Young, 2001). Allergic reactions have been reported and include pruritus, rash, urticaria, eczema, and anaphylaxis (Natural Medicines Comprehensive Database). Individuals sensitive to other plants from the *Asteraceae* (*Compositae*) family (e.g.,

ragweed, chrysanthemums, daisies) also may expect allergic reactions. Milk thistle is considered possibly safe by the Natural Medicines Comprehensive Database; however, reliable information is insufficient. Doses of up to 420 mg per day have been used (Ferenci et al., 1989). Tea is made from milk thistle, but the active ingredients are not water soluble (Foster & Tyler, 1999).

Pregnenolone has a scientific name of *(3beta)-3-hydroxy-pregn-5-en-20-one*. Self-medication with pregnenolone often is intended to slow or reverse aging, for arthritis, for gynecologic problems, or to increase energy (Natural Medicines Comprehensive Database, 2003). Produced in the body from cholesterol, pregnenolone is a precursor for all steroid hormones: progesterone, aldosterone, cortisol, dehydroepiandrosterone, testosterone, and estrogens (Devlin, 1992). Its estrogenic properties indicate that women with hormone-sensitive cancers should avoid this herb. In addition, this product can cause steroid-related adverse effects. Symptoms of overuse include insomnia, irritability, anger, anxiety, acne, headache, negative mood changes, facial hair growth, and hair loss (Natural Medicines Comprehensive Database). No typical dosages for pregnenolone are available, and the Natural Medicines Comprehensive Database found little reliable information about this product.

Progesterone has a scientific name of *4-pregnene-3*. Individuals self-medicate with this product for gynecologic conditions. It also has an estrogenic effect; therefore, women with breast cancer are advised to avoid progesterone. This hormone also should be avoided unless it is part of the management of breast cancer (Martindale, 1999). Some adverse reactions are weight gain, fatigue (Freeman, Weinstock, Rickels, Sondheimer, & Coutifaris, 1992; Micromedex Inc., 2002), acne, allergic skin rashes, symptoms similar to premenstrual syndrome, and irregular menstrual cycles (Micromedex Inc.). Products labeled natural progesterone, derived from natural sources only, are misleading because progesterone is prepared in a laboratory and is identical to endogenous progesterone. Progesterone is not found naturally in plants; as a result, prescription progesterone is synthesized from a constituent found in wild yam. The human body is incapable of synthesizing progesterone directly from wild yam (Foster & Tyler, 1999). The dosage of progesterone varies with the condition for which it is prescribed. The usual dosage is 200 mg of micronized progesterone. Notice the brand names in Table 2 that contain nonprescription progesterone.

Raspberry leaf has a scientific name of *Rubus idaeus*, which is synonymous with *Rubus strigosus*. People self-medicate with raspberry leaf for cardiovascular, gastrointestinal, and respiratory conditions (Blumenthal et al., 1998). Animal studies have revealed that raspberry leaf increases serum ceruloplasmin oxidase activity, a measure of estrogenic activity in the liver; therefore, women with hormone-sensitive cancers should avoid it (Eagon et al., 2000). No adverse effects have been reported. Midwives typically have given this herb to their patients to facilitate labor. Usually taken as tea, 2 g of dried leaf steeped in 240 ml of water for five minutes is the typical dose (McFarlin, Gibson, O'Rear, & Harman, 1999).

Red clover has a scientific name of *Trifolium pratense*. Self-medication with red clover is for bronchial conditions (Leung & Foster, 1996), sexually transmitted disease (Tyler, 1993), cancer, or menopause (Kurzer & Xu, 1997). Red clover is another herb with estrogenic properties that women with hormone-sensitive cancers should avoid (Le Bail, Champavier, Chulia, & Habrioux, 2000; Leung & Foster; Newall et

al., 1996). Red clover can cause rash-like reactions. It also interacts with drugs or herbs with anticoagulant properties (Brinker, 1998; Newall et al.), including angelica, chamomile, feverfew, garlic, ginkgo, and licorice. This herb is a component of Jason Winters Tea, an alternative therapy for cancer. A typical dose is 4 g of flower tops three times daily or one cup of tea three times daily (Newall et al.).

Resveratrol has a scientific name of *3,4',5'-stillbenetriol*. Individuals self-prescribe resveratrol products for atherosclerosis, to lower cholesterol levels, or to prevent cancer. Although evidence appears to exist that the resveratrol in red wine, red grape skins, purple grape juice, and mulberries reduces the risk of cancer, caution is advised because testing in humans has not been conducted (Carbo, Costelli, Baccino, Lopez-Soriano, & Argiles, 1999; Jang et al., 1997; Soleas, Diamandis, & Goldberg, 1997). White wines are low in trans-resveratrol concentrations. In red wines, pinot noir is consistently high in concentrations, regardless of climate. Cabernet sauvignon from colder climates (Bordeaux or Canada) has higher concentrations than wines from hot, dry climates (Natural Medicines Comprehensive Database, 2003). Women who already have hormone-sensitive cancers should avoid large amounts of products with resveratrol because of its estrogenic activity (Gehm, McAndrews, Chien, & Jameson, 1997). No adverse effects of resveratrol have been documented. Other products such as grape seed extracts frequently are combined with resveratrol. A safe dose of resveratrol is 200–600 mcg per day (Carbo et al.). One glass of red wine has about 640 mcg of resveratrol, and a handful of peanuts contains approximately 73 mcg of resveratrol (Natural Medicines Comprehensive Database).

Scarlet pimpernel has a scientific name of *Anagallis arvensis*. Individuals self-medicate with scarlet pimpernel to treat depression, cancer, and liver and kidney disorders. Estrogenic effects of this herb make it inadvisable for women with hormone-sensitive cancers. Gruenwald et al. (1998) reported that chronic use or large doses of scarlet pimpernel causes gastroenteritis and nephritis. Although no typical dose exists, Gruenwald et al. suggested drinking one cup of tea throughout the day.

Soy has a scientific name of *Glycine max*, which is synonymous with *Glycine soja*. Although some people use soy products as a substitution for cow's milk, soy also is taken for numerous conditions and for the prevention of breast or prostate cancer. Soy commonly is used to alleviate hot flashes caused by breast cancer treatments. Diets high in soy products appear to reduce the risk of prostatic disease and cancer (Evans, Griffiths, & Morton, 1995). However, the action of soy is controversial. Some scientists have suggested that soy increases the risk of breast cancer, whereas others have reported that soy may have some protective effect for breast cancer (Hakkak et al., 2000; McMichael-Phillips et al., 1998; Petrakis et al., 1996). Women with breast cancer or a history of breast cancer should avoid therapeutic doses of soy products, especially if they are taking tamoxifen (Facts and Comparisons, 2001; Massey, Palmer, & Horner, 2001; Smolinske, 1999). Two or more glasses of soy milk daily have been suggested to reduce the risk of prostate cancer (Jacobsen, Knutsen, & Fraser, 1998). Safe therapeutic doses of soy vary from 20–60 g per day for adults (Natural Medicines Comprehensive Database, 2003).

Star anise has a scientific name of *Illicium verum*. People self-medicate with star anise for gastrointestinal and respiratory

conditions. Women with hormone-sensitive cancers should avoid this herb because of its estrogenic properties (Leung & Foster, 1996). Adverse reactions are rare for this herb. A typical dose is 3 g or 0.3 g of essential oil (Bisset & Wichtl, 1994).

Vitamin C has a scientific name of *ascorbic acid*. A very popular self-medication, vitamin C often is used to treat the common cold. Findings show that high concentrations of dehydroascorbic acid, the oxidized form of vitamin C, accumulate in cancerous cells. After oxidation and concentration in cells, the dehydroascorbic acid is converted back to vitamin C (Agus, Vera, & Golde, 1999; Spielholz, Golde, Houghton, Nualart, & Vera, 1997; Vera, Rivas, & Zhang, 1998; Vera, Rivas, Zhang, Furber, & Golde, 1994). Benefit or detriment to cancer cell growth has not been determined when oxidization and conversion occur. In view of this, patients with cancer should avoid high doses of vitamin C.

Several medications can increase the elimination of vitamin C, including aspirin and other salicylates (Hansten & Horn, 1997; McKevo, 1998), barbiturates, estrogen and oral contraceptives, smoking and nicotine, and tetracyclines (Brinker, 1998; McKevo). Vitamin C in high doses is associated with deep vein thrombosis. Prolonged use establishes a high metabolism of vitamin C, and rebound scurvy can result with an abrupt dosage reduction. Individuals prone to renal calculus are at greater risk of developing stones when they take high doses of this vitamin (Health and Welfare Canada, 1990; McKevo; Montbriand, 1994b). The recommended daily dose of vitamin C is 30–40 mg (Health and Welfare Canada). The Natural Medicines Comprehensive Database (2003) recommended a dose as high as 90 mg per day. The American Cancer Society stated that no substantial evidence exists that supplements can reduce cancer risk; however, the intake of fruits and vegetables containing vitamin C or other antioxidants (vitamin E, selenium, and carotenoids) seems to lower risk of cancer (American Cancer Society 1996 Advisory Committee on Diet, Nutrition, and Cancer Prevention, 1996).

Vitamin E has a scientific name of *alpha-tocopherol*, among others. This vitamin is a popular self-medication for cardiovascular and cancer conditions. Antioxidants, such as vitamin E, are connected to minimizing the effects of normal oxidative damage, which is associated with cancer development (Blumenthal et al., 2000). Furthermore, RRR-alpha-tocopheryl succinate, also known as vitamin E succinate, is being studied for its chemotherapeutic and chemopreventive potential (Israel, Yu, Sanders, & Kline, 2000). However, efficacy of chemotherapy can be reduced when antioxidants such as vitamins C and E are used concomitantly. Patients undergoing chemotherapy should avoid the use of vitamin C and E, except under their oncologists' supervision (Watanabe, Kakihana, Ohtsuka, & Sugishita, 1997).

Use of vitamin E, along with anticoagulant and antiplatelet agents, increases the risk of bleeding through inhibition of platelet aggregation and antagonism of vitamin K-dependent clotting factors (Liede, Haukka, Saxen, & Heinonen, 1998). The risk of bleeding is increased when vitamin E is used with anticoagulant or antiplatelet herbs such as anise, chamomile, feverfew, garlic, and Panax ginseng (Brinker, 1998; Newall et al., 1996). According to Health and Welfare Canada (1990), the recommended daily dose for adults 19 years and older is 10 mg. Vitamin E is naturally present in significant amounts in cereal grains such as wheat, oats, and barley.

Wild yam has a scientific name of *Discorea villosa*, among others. Individuals self-prescribe wild yam believing it is a

natural alternative to estrogen. Wild yam has estrogenic properties that women with hormone-sensitive cancers should avoid (Eagon et al., 2000). Ingestion of large amounts of wild yam has caused emesis (McGuffin et al., 1997). The Natural Medicines Comprehensive Database (2003) indicated that no typical dose is known (see also DHEA and progesterone).

Conclusion and Implications

This review provides information about 32 herbs and natural products with the potential to increase the growth of cancer. It also denotes that 25 of these 32 herbs and products may enhance the growth of hormone-sensitive cancers, such as breast, uterine, or ovarian cancer. Awareness of the negative potentials of these products can alert patients with cancer and healthcare professionals about interactions with cancer therapies or the potential to increase cancer growth.

In addition to the practice implications discussed in Part I of this series of articles, certain other concerns are warranted. Notably, some herbs and natural products were discussed under one heading in this article; they are (a) cohosh (black and blue), (b) ginseng (American, Panax, and Siberian), and (c) glucosamine (hydrochloride, sulfate, and N-acetyl). Patients often look for a product or an herb without knowing that more than one plant or product exists that uses the same name. This grouping makes this article succinct and alerts patients and healthcare professionals to the subtle differences among the plants and products in these categories.

Tables 1 and 2 include advisories that some brand names contain glandular or organ material taken from animals. If this material was taken from diseased animals, the product itself may be harboring bovine spongiform encephalopathy (i.e., mad cow disease). Although the risk of transferring this disease to humans is considered to be rare, patients should avoid these products. This advisory also is applicable to products such as deer velvet. Chronic-wasting disease among North American elk and deer is related closely to bovine spongiform encephalopathy; therefore, patients should consider this risk before self-medicating.

Some research evidence seems positive about products containing lactobacillus bacteria, or fermented products (e.g., kefir), but patients with cancer should use extreme caution. The literature recommends avoiding the concomitant use of bacteria products with chemotherapy agents. Patients with cancer should refrain from overtaxing their bodies, which are fighting cancer, with additional bacteria.

In conclusion, this article emphasizes the herbs and natural products that have the potential to interact with hormone-sensitive cancers. These 25 herbs and products provide strong evidence that women with breast, ovarian, or uterine cancers are in vulnerable positions and should exercise extreme care in taking any additional natural products whether they are characterized as healing agents or not. Healthcare professionals are in a unique position for being resources for women who will benefit greatly from this information.

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Author Contact: Muriel J. Montbriand, PhD, RN, can be reached at montbriand@skyway.usask.ca, with copy to editor at rose_mary@earthlink.net.

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