

# US Sales of Herbal Supplements Increase 4.4% in 2023

*Modest sales increase suggests market is continuing to normalize after pandemic-related fluctuations; consumers in 2023 prioritize products for cardiovascular and cognitive health*

By Tyler Smith,<sup>a</sup> Carly Lang,<sup>b</sup> and Erika Craft<sup>c</sup>

<sup>a</sup> American Botanical Council (Austin, Texas)

<sup>b</sup> SPINS (Chicago, Illinois)

<sup>c</sup> *Nutrition Business Journal* (Boulder, Colorado)

## INTRODUCTION

Annual sales of herbal dietary supplements in the United States totaled an estimated \$12.551 billion in 2023, according to data from the *Nutrition Business Journal* (NBJ). This 4.4% increase in sales corresponds to an additional \$533 million spent on these products in 2023 compared to the previous year. Since the beginning of the COVID-19 pandemic, annual spending on herbal supplements has fluctuated, with record-breaking sales in 2020 and the first sales decline in nearly two decades in 2022. The 4.4% sales increase in 2023 is notably lower than the average annual sales increase of 8.2% from 2015 to 2019 but suggests that consumer sales may be returning to the previous upward trend (Table 1).

The US retail sales figures in this report were provided by NBJ, a natural products industry publication of Informa’s New Hope Network based in Boulder, Colorado, and SPINS, a leading provider of retail consumer insights, analytics, and consulting for the natural products industry, based in Chicago, Illinois. NBJ supplied estimates of total annual sales of herbal supplements, as well as total sales in three market channels (mass market; natural, health food, and specialty; and direct sales) and sales by product type (single-herb supplements vs. combination formulas). SPINS provided sales data for the 40 top-selling herbal and fungal ingredients in the mainstream retail channel (i.e., the multi-outlet channel, powered by Circana) and the natural (now called “natural expanded”) retail channel. Channel definitions are included in Table 2.

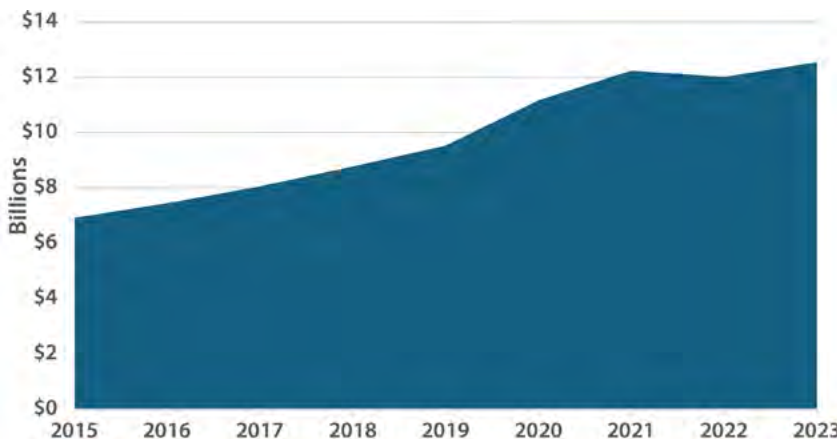
In 2023, annual sales of herbal supplements increased in each of NBJ’s retail channels (Table 3). Mass market sales increased by 5.2% from the previous year, totaling \$2.484 billion. Direct sales of herbal supplements, as discussed later in this report, increased by 5.3% to a total of \$7.027 billion. The natural, health food, and specialty retail channel had the smallest sales increase of 1.9% and totaled \$3.040 billion in 2023.

The SPINS data discussed in this report include sales of dietary supplements in which the herbal or fungal ingredient (or derivative thereof, such as quercetin) is the primary functional ingredient. This includes only products that meet the legal definition of a dietary supplement per the US Food and Drug

Year	Total Sales	% Change
2023	\$12.551 billion	4.4%
2022	\$12.018 billion	-1.8%
2021	\$12.241 billion	9.6%
2020	\$11.168 billion	17.2%
2019	\$9.530 billion	8.6%
2018	\$8.778 billion	8.9%
2017	\$8.057 billion	8.1%
2016	\$7.452 billion	7.7%
2015	\$6.922 billion	7.5%

Source: *Nutrition Business Journal* (NBJ)  
 \* Includes sales in all channels. NBJ primary research includes NBJ surveys of supplement manufacturers, distributors, MLM firms, mail order, internet, and raw material and ingredient supply companies, as well as interviews with major retailers (Walmart, Costco, etc.), supplement manufacturers, suppliers, and industry experts. Secondary sources include IRI (Circana), SPINSScan Natural, Nielsen, *Natural Foods Merchandiser*, Insight, The Hartman Group, company data, and other published material.

Total US Retail Sales of Herbal Supplements (2015-2023)



Administration (FDA), except for products containing cannabidiol (CBD), a psychoactive but non-intoxicating compound in cannabis (*Cannabis sativa*, Cannabaceae). Sales of teas or cosmetics with botanical ingredients are not included. The dollar amounts are estimates of the total sales during the 52-week period that ended December 31, 2023. The mainstream and natural expanded channel sales discussed in this report refer to retail sales in the United States only.

**MAINSTREAM CHANNEL**

**Top Sales: Psyllium**

In 2023, for the second consecutive year, psyllium (*Plantago ovata*, Plantaginaceae) ranked first in mainstream retail sales. (In 2020 and 2021, during the first two years of the COVID-19 pandemic, elder berry [*Sambucus nigra*, Viburnaceae] was the top-selling herbal supplement ingredient in this channel.) Sales of psyllium grew by 2.7% in 2023, compared to the 9.8% growth seen in 2022.

Psyllium, also known as ispaghula, has been used for millennia in various traditional medicine systems, including Ayurveda, traditional Persian medicine, and traditional Chinese medicine (TCM). Psyllium has been used to treat constipation, diarrhea, dermatological conditions, and high blood pressure, among other issues. Its beneficial properties are attributed primarily to the high amounts of soluble and insoluble fiber in the seeds and seed husks, and the gel-forming properties of the seeds.<sup>1</sup>

Psyllium *Plantago ovata*  
Photo ©2024 Steve Foster



**Calculating Percentage Change**

Percentage sales changes from 2022 to 2023 were calculated using updated 2022 sales data that SPINS provided for this report in late June 2023. Some of the updated sales figures for 2022 differ from those published in *HerbalGram's* 2022 Herb Market Report. This is the case every year, as sales totals change when new data become available or if sales are reclassified.

The sales totals for individual ingredients published in the previous year's Herb Market Report usually differ by a relatively small amount from SPINS' updated figures. However, due to recent data coding and channel definition changes at SPINS, the updated 2022 sales totals for several ingredients differed significantly (> 10%) from those published in the 2022 Herb Market Report. As a result, the percentage changes for some ingredients in this report may appear incorrect when comparing 2023 sales in this report with the sales listed in the 2022 Herb Market Report.

The ingredients with 2022 sales changes above 10% are noted below.

	Sales in 2022 Herb Market Report	Updated 2022 Sales Data	% Change
<b>Mainstream Channel</b>			
St John's wort	\$28,905,466	\$6,086,297	-78.9%
Saw palmetto	\$22,579,760	\$30,764,437	36.2%
Echinacea	\$41,986,186	\$30,209,717	-28.0%
Wheatgrass / Barley grass	\$25,977,536	\$32,144,370	23.7%
Horny goat weed	\$15,451,919	\$12,475,505	-19.3%
Ginger	\$40,780,915	\$46,226,503	13.4%
Red yeast rice	\$12,952,243	\$14,609,365	12.8%
Green coffee extract	\$7,858,803	\$6,890,607	-12.3%
Garlic	\$27,753,977	\$24,432,606	-12.0%
<b>Natural Channel</b>			
Psyllium	\$10,571,193	\$11,759,054	11.2%

Source: SPINS

**Table 2. US Retail Channel Definitions\***

	SPINS	<i>Nutrition Business Journal</i>
<b>Mainstream Retail Channels</b>	<b>Multi-Outlet Channel (powered by Circana)</b> Covers grocery outlets (stores with \$2 million+ total annual sales), drug outlets (chains and independent stores, excluding prescription sales), and selected retailers across mass merchandisers, including Walmart, club, dollar, and military stores representing more than 105,000 retail locations.	<b>Mass Market Channel</b> Includes food/grocery, drug, mass merchandise, and club and convenience stores (e.g., Walmart, Costco, etc.).
<b>Natural Retail Channels</b>	<b>Natural Expanded Channel</b> Includes full-format stores with \$2 million+ in annual sales and 30% or more of UPC-coded sales from Health and Wellness Index (HWI) and 15% or more from Natural Product Index (NPI) Universe. It includes co-ops, associations, independents, and large regional chains (excluding Whole Foods Market and Trader Joe's). This channel represents more than \$31 billion in total sales and encompasses more than 2,000 stores.	<b>Natural, Health Food, and Specialty Channel</b> Includes supplement and specialty retail outlets, including Whole Foods Market (estimates), GNC, sports nutrition stores, etc.
<b>Direct Sales</b>		Includes direct-to-consumer sales from the internet (e.g., e-commerce websites such as Amazon.com and Walmart.com, among many others), direct-selling media (TV, radio, and print publications), health practitioners, and multilevel marketing (MLM) or network marketing firms (US sales only).

\* The sales discussed in this article pertain to those involving herbal, fungal, and related dietary supplements. They generally do not include herbs sold as teas and beverages, as ingredients in conventional foods, or as ingredients in natural personal care and cosmetic products.

The FDA permits psyllium as an ingredient in dietary supplements as well as in some over-the-counter (OTC) drug products (e.g., OTC bulk laxative drug products), which have separate regulatory requirements.<sup>1-3</sup> Sales of OTC drugs that contain psyllium are not included in this report.

Cardiovascular health and digestive health were the two largest health focus categories of psyllium supplements sold in 2023 and made up 68.8% and 18.4% of total psyllium products sold, respectively. These percentages are roughly the same as in 2022. Sales of psyllium supplements for cardiovascular health grew by 2% in 2023, with sales totaling roughly \$190 million. Sales of digestive health products,

while still the second largest category of psyllium supplements, declined by 9% to \$50.8 million. Products with “non-specific” health focuses (i.e., general statements such as “supports wellness”) were the third largest category of psyllium supplements (6.2%) and increased by 10.2% in 2023.

Although psyllium may be best known for its use in digestive health products, its cardiovascular effects are also well documented. Published in June 2024, a systematic review of 29 randomized controlled trials (RCTs) assessed the effects of psyllium consumption on specific blood lipid parameters. The review, which included 2,769 total participants, found that consumption of psyllium seed or seed

**Health Focuses and Label Statements**

SPINS uses the term “health focus” to describe and categorize health-related statements on product labels. An herbal dietary supplement with the text “Can help support regularity” on its label, for example, would be placed in the “digestive health” category. Other health focus categories include immune health, cardiovascular health, cleanse and detox, weight loss, and blood sugar support, among many others.

Per US regulations, dietary supplement labels are not permitted to include any statements that suggest the product can diagnose, treat, cure, or prevent any disease. In a few cases, the US Food and Drug Administration (FDA) has authorized disease-prevention claims for herbal ingredients with supporting scientific evidence that meets specific criteria. (Such pre-approved health claims are authorized under the Nutrition Labeling and Education Act of 1990.) Dietary supplements that contain psyllium seed husk, for example, can mention an “association between [consumption of] soluble fiber from psyllium seed husk and reduced risk of coronary heart disease.”<sup>1</sup>

So-called “structure/function” claims — a description of how an ingredient may affect the normal structure or function of the human body — are permitted on dietary supplements per the Dietary Supplement Health and Education Act of 1994, but only if the manufacturer submits documentation for the claim and notifies the FDA within 30 days of marketing the supplement with the claim.<sup>1</sup>

**Reference**

1. Label Claims for Conventional Foods and Dietary Supplements. US Food and Drug Administration website. Available at: [www.fda.gov/food/food-labeling-nutrition/label-claims-conventional-foods-and-dietary-supplements](http://www.fda.gov/food/food-labeling-nutrition/label-claims-conventional-foods-and-dietary-supplements). Accessed August 9, 2024.

**Table 3. Total Herbal Supplement Sales in US by Retail Channel**

	2015	2016	2017	2018	2019	2020	2021	2022	2023	% Change from 2022
<b>Mass Market</b>	\$1.204 billion	\$1.336 billion	\$1.449 billion	\$1.566 billion	\$1.712 billion	\$2.142 billion	\$2.216 billion	\$2.360 billion	\$2.484 billion	5.2%
<b>Natural, Health Food, and Specialty</b>	\$2.356 billion	\$2.506 billion	\$2.624 billion	\$2.804 billion	\$2.904 billion	\$2.950 billion	\$2.992 billion	\$2.984 billion	\$3.040 billion	1.9%
<b>Direct Sales</b>	\$3.363 billion	\$3.609 billion	\$3.984 billion	\$4.408 billion	\$4.913 billion	\$6.076 billion	\$7.033 billion	\$6.674 billion	\$7.027 billion	5.3%

Source: Nutrition Business Journal

husk was associated with significantly reduced total cholesterol (TC) and low-density lipoprotein (LDL) cholesterol levels, but not high-density lipoprotein (HDL) cholesterol or triglycerides. The authors determined that the observed decreases in TC and LDL cholesterol levels correlated to an estimated 7% reduction in the risk of experiencing a cardiovascular event.<sup>4</sup>

A larger systematic review published in December 2023 of 61 RCTs with 4,100 total participants examined a wider range of psyllium’s potential cardiovascular effects. The analysis found that psyllium consumption correlated with significantly decreased fasting blood sugar, hemoglobin A1C, and systolic blood pressure, as well as TC and LDL cholesterol levels. Notably, some of the reviewed studies did not take into account the participants’ diets, physical activity levels, or use of other dietary supplements. Given these potential limitations, the authors advised that “psyllium be taken into account as a possible option in [cardiovascular] disease management.”<sup>5</sup>

The positive effects of fiber consumption on digestive health issues such as constipation are largely supported by clinical evidence. A 2022 systematic review of 16 RCTs of healthy adults with constipation concluded that psyllium was more effective than osmotic and stimulant laxatives in improving bowel movement frequency. Of the seven sources of fiber reviewed, the authors concluded that psyllium husk, at dosages of 10 grams or more per day, was the most effective ingredient for constipation relief.<sup>6</sup>

Psyllium’s effects on other digestive health conditions are generally less established. Another systematic review published in 2022 assessed the effects of several sources of dietary fiber on symptoms of inflammatory bowel disease (IBD). The reviewed studies on psyllium had mixed results, and the authors concluded that evidence of the potential benefits of psyllium for IBD was “still too limited.”<sup>7</sup>

**Top Sales Growth: Beet Root**

Among the 40 top-selling herbal supplement ingredients in the mainstream channel, beet root (*Beta vulgaris*, Amaranthaceae) had the highest percentage sales growth. (For the purposes of this report, any subsequent mention of sales growth refers to *percentage* sales growth.) Annual retail sales

of these supplements more than doubled in 2023 compared to the previous year, with sales totaling \$65,022,645 — a 108% increase, corresponding to an additional \$33.7 million in sales in 2023.

Mainstream sales of beet root have increased each year since at least 2018, when it first appeared on the list of 40 top-selling ingredients in this channel with sales of roughly \$8.29 million. Since then, annual sales have increased nearly eight-fold (by more than \$56.7 million) from 2018 to 2023. During that time, beet root has risen to the eighth top-selling mainstream herbal supplement ingredient compared to its 30th-place rank in 2018.



Beet *Beta vulgaris*  
Photo ©2024 Steven Foster

Beet root, the taproot of the beet plant, has long been used as both food and medicine. Ancient Greeks and Romans used beet root to detoxify the blood, as an aphrodisiac, and to cleanse the kidneys, liver, and bowels.<sup>8</sup> Today, beet root is used mostly as a food, but interest in its potential medicinal applications has increased in recent decades. The therapeutic use of beet root is based primarily on its high nitrate content. Many plants, including spinach (*Spinacia oleracea*, Amaranthaceae), arugula (*Eruca vesicaria*, Brassicaceae), and celery (*Apium graveolens*, Apiaceae), contain nitrates, which are a precursor to nitric oxide (NO).<sup>9</sup> NO is a gaseous signaling molecule that plays various essential roles in the body, including in muscle, metabolic, and vascular function.<sup>10</sup> For these reasons, beet root supplements first became popular for their performance benefits, particularly among athletes. However, in recent years, beet root supplements have become more widely used by both athletes and non-athletes for other purposes, such as cardiovascular and cognitive health.

More than half of the beet root supplements sold in mainstream retail outlets in 2023 were marketed for energy support (53%), according to SPINS. Sales of beet root products with this health focus increased by 145% in 2023 — the second-strongest sales growth of any category of beet root products. Products sold for performance benefits had the strongest sales growth of 372% in 2023. However, perhaps surprisingly, this category made up only a small percentage (0.01%) of beet root product sales. This may be due to perceived similarities in benefits provided by energy support and performance products.

After energy support, cardiovascular health was the second-highest-grossing health focus of beet root supplements sold in 2023 and made up roughly a third (32.0%) of overall sales. Sales of beet root products with this health focus nearly doubled from 2022 to 2023. Products marketed for cognitive health, a small but growing category of beet root supplements, also increased in 2023, by 11.3%.

The efficacy of beet root supplements for general energy support has not been established in the scientific literature. A PubMed search in late July 2024 found no human clinical trials on beet root products specifically for energy support or fatigue relief.<sup>11</sup> The authors of a 2019 narrative review attempted to summarize findings on beet root supplements for cancer-related fatigue but found no relevant clinical trials.<sup>12</sup>

Most human clinical trials on beet root products are related to effects on physical activity or sports performance and often include only healthy, young male participants. Studies of beet root that have energy and fatigue parameters therefore are usually exercise related. A systematic review and meta-analysis published in January 2024 concluded that beet root-based supplements can improve muscular endurance, modestly increase exercise time until exhaustion, and aid in the “recovery of muscular strength after a fatiguing task.”<sup>13</sup> Performance-related studies of beetroot often focus on high-intensity or endurance activities such as cycling, sprinting, rowing, and weightlifting. A literature review of beet root’s

effects on exercise performance published in 2024 noted that beet root supplementation “had small but [statistically] significant positive effects on some performance outcomes during single and repeated bouts of high-intensity exercise, as well as endurance, high-power explosive, and high-intensity intermittent exercise.”<sup>14</sup>

Dietary nitrates are known to enhance certain physiological actions in humans. They have been shown to reduce the amount of oxygen used by muscles during exercise, lower the energy cost of muscle function, and increase blood flow to muscles.<sup>15,16</sup> The International Olympic Committee has acknowledged that dietary nitrate supplementation has “good to strong evidence of achieving benefits to performance” with few side effects or limitations.<sup>17</sup>

Research into the potential cardiovascular benefits of beet root supplementation has increased in recent years. A 2020 literature review noted that NO, such as that produced after consuming nitrate-rich foods like beet root, “supports cardiovascular function, causes vasodilation, and decreases blood pressure.”<sup>18</sup> Similarly, the authors of a systematic review published in 2020 concluded that “because of its effects on the cardiovascular system, [beet root juice] consumption could possibly be used as a supplement in different treatments for cardiovascular disease.”<sup>19</sup>

### Other Sales Increases

Among the 40 top-selling herbal supplement ingredients in the 2023 mainstream channel, six others had sales increases greater than 20%: wheatgrass/barley grass (*Triticum aestivum/Hordeum vulgare*, Poaceae; +103.6%), bacopa (*Bacopa monnieri*, Plantaginaceae; +71.7%), oats (*Avena sativa*, Poaceae; +57.7%), cinnamon (*Cinnamomum* spp., Lauraceae; +57.3%), ginkgo (*Ginkgo biloba*, Ginkgoaceae; +42.8%), and guarana (*Paullinia cupana*, Sapindaceae; +36.0%).

Notably, half of those ingredients are known for their cognitive health effects. Ginkgo leaf is commonly used to improve cognitive functions such as memory,<sup>20</sup> and in 2023, nearly 100% of bacopa and oat supplements sold in the mainstream channel were marketed for cognitive health support.

### Sales Decreases

Only three of the top 40 ingredients in the 2023 mainstream channel experienced sales decreases greater than 20%: ivy leaf (*Hedera helix*, Araliaceae; -28.5%), elder berry (*Sambucus nigra* and *S. canadensis*; -27.7%), and CBD (-25.9%).

## NATURAL EXPANDED CHANNEL

### Top Sales: Turmeric

Turmeric was the top-selling herbal supplement ingredient in natural retail stores in 2023. Sales totaled \$37,075,334 and were essentially unchanged from the previous year, differing by less than 0.02%. Turmeric supplements in the natural channel had annual sales growth greater than 10% throughout much of the 2010s and peaked in 2018, when

sales totaled roughly \$51.2 million. Sales have declined each year since then, before increasing slightly in 2023. CBD overtook turmeric as the top-selling herbal supplement ingredient in the natural channel from 2018 to 2021, as turmeric sales declined. However, turmeric regained its first-place rank in 2022 and 2023, as CBD continued to experience sales decreases.

Turmeric has a long history of use as a spice and in the traditional medicine systems of India (e.g., Ayurveda and Unani) and other Asian countries such as China, Japan, and Korea. Historically, turmeric preparations have been used medicinally for a wide range of conditions, including asthma, dental problems, indigestion, skin infections, wounds, liver issues, and inflammation, among many others. Some health benefits of turmeric have been attributed to curcuminoids, a group of bioactive polyphenols found in turmeric, particularly the compound curcumin. Consumer turmeric products typically contain turmeric root extracts with high levels of curcumin or several curcuminoids and are available in various forms, including capsules, tablets, tinctures, and gummies.<sup>21,22</sup>

The top three health focuses for turmeric supplements sold in 2023 were pain and inflammation (56.6% of total sales), joint health (13.2%), and non-specific uses (11.7%). Sales of turmeric supplements in each of these categories were relatively stable from 2022 to 2023, with no fluctuations greater than 2.5%. Sales of turmeric-containing supplements marketed for pain and inflammation totaled approximately \$21 million in 2023 (a 0.04% increase). Turmeric sales in the joint health category dropped slightly to roughly \$4.9 million in 2023 (a 0.8% decrease), and sales of non-specific turmeric supplements totaled \$4.3 million (a 2.1% increase).

In general, SPINS receives sales data that can be categorized into fewer than 10 health focuses for most ingredients, as many herbal supplements are used for specific or related purposes. However, the 2023 sales data for turmeric include 20 health focuses, most of which make up less than 1% of overall sales. This reflects the unusually wide variety of potential benefits attributed to turmeric, from hydration and sleep to performance and prostate



Turmeric *Curcuma longa*  
Photo ©2024 Steven Foster

support. Of the health focuses that each account for more than 1% of turmeric sales, cardiovascular health had the largest sales increase of 6.5% from 2022 to 2023.

As the anti-inflammatory effects of turmeric are well-documented in both pre-clinical and clinical studies, it is perhaps not surprising that the two best-selling health focuses of turmeric supplements in 2023 are closely associated with inflammation. Human clinical trials related to pain frequently are focused on specific conditions (e.g., arthritis, fibromyalgia, migraine, etc.<sup>23</sup>), but several scientific journal articles published in the past decade have attempted to summarize the effects of turmeric or curcumin on pain more generally. The authors of a 2018 literature review of the analgesic effects of turmeric and curcumin noted that “Turmeric has consistently been demonstrated to produce analgesic and anti-inflammatory effects in animal models and in clinical trials, and appears to have less serious adverse effects than many current analgesics.”<sup>24</sup> Similarly, a literature review published in 2021 concluded that curcumin is a promising and safe polyphenolic molecule that targets “multiple molecular pathways in pain and can be beneficial in the treatment and management of pain and inflammation.”<sup>25</sup>

The effects of turmeric and curcumin on conditions related to joint health have been the subject of numerous human studies. A 2023 meta-analysis of 23 RCTs with 2,175 total participants assessed the effects of “curcumin” (i.e., turmeric extracts and curcumin preparations) in people with knee osteoarthritis. The authors found that curcumin significantly reduced self-reported measures of pain compared to placebo and that curcumin alone and curcumin with non-steroidal anti-inflammatory drugs (NSAIDs) reduced the incidence of adverse events compared

**Table 4. Top-Selling Herbal Supplements in 2023 — US Mainstream Channel**

Rank	Primary Ingredient	Latin Binomial	Total Sales	% Change
1	Psyllium <sup>a</sup>	<i>Plantago ovata</i>	\$276,124,315	2.7%
2	Elder berry	<i>Sambucus nigra</i> and <i>S. canadensis</i>	\$176,953,924	-27.7%
3	Turmeric <sup>b</sup>	<i>Curcuma longa</i>	\$133,300,417	3.7%
4	Ashwagandha	<i>Withania somnifera</i>	\$120,445,117	8.7%
5	Apple cider vinegar	<i>Malus</i> spp.	\$101,048,008	-19.8%
6	Cranberry	<i>Vaccinium macrocarpon</i>	\$89,359,040	-0.8%
7	Wheatgrass / Barley grass	<i>Triticum aestivum</i> / <i>Hordeum vulgare</i>	\$65,460,305	103.6%
8	Beet root	<i>Beta vulgaris</i>	\$65,022,645	108.0%
9	Ginger	<i>Zingiber officinale</i>	\$51,303,645	11.0%
10	Green tea	<i>Camellia sinensis</i>	\$40,703,222	9.7%
11	Fenugreek	<i>Trigonella foenum-graecum</i>	\$40,522,172	-8.9%
12	Ivy leaf	<i>Hedera helix</i>	\$35,522,755	-28.5%
13	Ginkgo	<i>Ginkgo biloba</i>	\$33,114,457	42.8%
14	Guarana	<i>Paullinia cupana</i>	\$29,493,609	36.0%
15	Maca	<i>Lepidium meyenii</i>	\$29,418,051	7.7%
16	Saw palmetto	<i>Serenoa repens</i>	\$29,147,836	-5.3%
17	Cinnamon	<i>Cinnamomum</i> spp.	\$25,559,120	57.3%
18	Echinacea <sup>c</sup>	<i>Echinacea</i> spp.	\$24,665,527	-18.4%
19	Tribulus	<i>Tribulus terrestris</i>	\$23,845,751	-4.3%
20	Pycnogenol <sup>®</sup>	<i>Pinus pinaster</i>	\$23,130,138	6.7%
21	Garlic	<i>Allium sativum</i>	\$23,103,285	-5.4%
22	Milk thistle	<i>Silybum marianum</i>	\$20,937,232	10.1%
23	Black cohosh	<i>Actaea racemosa</i>	\$19,885,112	-5.1%
24	Aloe	<i>Aloe vera</i>	\$19,855,094	4.2%
25	Flax seed / Flax oil	<i>Linum usitatissimum</i>	\$19,603,040	-7.6%
26	Valerian	<i>Valeriana officinalis</i>	\$18,290,146	-12.5%
27	Pumpkin	<i>Cucurbita pepo</i>	\$16,444,778	-12.8%
28	Goji berry	<i>Lycium</i> spp.	\$15,497,248	-7.2%
29	Red yeast rice <sup>d</sup>	<i>Oryza sativa</i>	\$15,382,466	5.3%
30	Yohimbe	<i>Pausinystalia johimbe</i>	\$13,670,726	-16.8%
31	Horny goat weed	<i>Epimedium</i> spp.	\$12,178,485	-2.4%
32	Cannabidiol (CBD)	<i>Cannabis sativa</i>	\$11,147,381	-25.9%
33	Fennel	<i>Foeniculum vulgare</i>	\$10,835,152	-0.1%
34	Oats / Oatstraw	<i>Avena sativa</i>	\$10,643,718	57.7%
35	Bacopa	<i>Bacopa monnieri</i>	\$9,997,966	71.7%
36	Senna <sup>e</sup>	<i>Senna alexandrina</i>	\$9,721,771	-6.4%
37	Rhodiola	<i>Rhodiola</i> spp.	\$9,381,370	1.0%
38	Dandelion	<i>Taraxacum officinale</i>	\$9,220,759	19.3%
39	Rhubarb	<i>Rheum</i> spp.	\$8,220,104	-15.5%
40	Ginseng	<i>Panax</i> spp.	\$8,080,788	12.6%

Source: SPINS (52 weeks ending December 31, 2023)

<sup>a</sup> Excludes over-the-counter (OTC) drugs that contain psyllium.  
<sup>b</sup> Includes standardized turmeric extracts with high levels of curcumin.  
<sup>c</sup> Includes three *Echinacea* species: *E. angustifolia*, *E. pallida*, and *E. purpurea*.  
<sup>d</sup> Red yeast rice is fermented with the yeast *Monascus purpureus*.  
<sup>e</sup> Excludes OTC laxative drugs that contain senna or sennosides.

**Table 5. Top-Selling Herbal Supplements in 2023 — US Natural Channel**

Rank	Primary Ingredient	Latin Binomial	Total Sales	% Change
1	Turmeric <sup>a</sup>	<i>Curcuma longa</i>	\$37,075,334	0.0%
2	Cannabidiol (CBD)	<i>Cannabis sativa</i>	\$29,913,962	-13.8%
3	Elder berry	<i>Sambucus nigra</i> and <i>S. canadensis</i>	\$24,073,035	-20.1%
4	Mushrooms (other)	—	\$20,907,654	31.0%
5	Ashwagandha	<i>Withania somnifera</i>	\$20,003,585	9.1%
6	Wheatgrass / Barley grass	<i>Triticum aestivum</i> / <i>Hordeum vulgare</i>	\$15,809,494	-13.1%
7	Milk thistle	<i>Silybum marianum</i>	\$13,530,678	26.0%
8	Aloe	<i>Aloe vera</i>	\$13,216,209	-3.5%
9	Psyllium <sup>b</sup>	<i>Plantago ovata</i>	\$12,975,125	10.3%
10	Oregano <sup>c</sup>	<i>Origanum vulgare</i>	\$11,790,179	13.7%
11	Quercetin <sup>d</sup>	—	\$11,771,740	-30.8%
12	Flax seed / Flax oil	<i>Linum usitatissimum</i>	\$10,756,007	1.5%
13	Beet root	<i>Beta vulgaris</i>	\$10,016,171	22.5%
14	Echinacea <sup>e</sup>	<i>Echinacea</i> spp.	\$9,204,852	-1.2%
15	Barberry	<i>Berberis vulgaris</i>	\$8,393,680	98.3%
16	Cranberry	<i>Vaccinium macrocarpon</i>	\$8,169,361	1.0%
17	Saw palmetto	<i>Serenoa repens</i>	\$8,154,055	0.7%
18	Spirulina / Blue-green algae <sup>f</sup>	<i>Arthrospira platensis</i> and <i>A. maxima</i> / —	\$7,856,422	9.4%
19	Black cumin	<i>Nigella sativa</i>	\$7,779,474	23.7%
20	Algae (other)	—	\$7,589,904	24.4%
21	Valerian	<i>Valeriana officinalis</i>	\$7,095,879	5.4%
22	Maca	<i>Lepidium meyenii</i>	\$7,009,452	2.7%
23	Chlorophyll / Chlorella	— / <i>Chlorella vulgaris</i>	\$6,541,624	4.1%
24	Garlic	<i>Allium sativum</i>	\$6,177,988	-9.1%
25	Reishi mushroom	<i>Ganoderma lucidum</i>	\$5,640,299	11.2%
26	Cordyceps mushroom	<i>Cordyceps</i> spp.	\$5,225,915	19.5%
27	Kava	<i>Piper methysticum</i>	\$5,132,392	22.5%
28	Echinacea-goldenseal combo	<i>Echinacea</i> spp. / <i>Hydrastis canadensis</i>	\$5,123,563	-1.4%
29	Ginkgo	<i>Ginkgo biloba</i>	\$4,822,172	-0.1%
30	Apple cider vinegar	<i>Malus</i> spp.	\$4,254,662	-9.8%
31	Resveratrol <sup>g</sup>	—	\$4,128,804	6.5%
32	Papaya	<i>Carica papaya</i>	\$3,819,634	0.6%
33	Ginger	<i>Zingiber officinale</i>	\$3,738,016	8.9%
34	Bacopa	<i>Bacopa monnieri</i>	\$3,721,122	4.0%
35	Horsetail	<i>Equisetum</i> spp.	\$3,659,752	-7.8%
36	Red yeast rice <sup>h</sup>	<i>Oryza sativa</i>	\$3,657,690	3.2%
37	Cherry	<i>Prunus</i> spp.	\$3,625,993	-0.1%
38	Fenugreek	<i>Trigonella foenum-graecum</i>	\$3,475,049	2.8%
39	Boswellia	<i>Boswellia serrata</i>	\$3,409,180	10.9%
40	Hawthorn	<i>Crataegus</i> spp.	\$3,216,273	-0.9%

Source: SPINS (52 weeks ending December 31, 2023)

<sup>a</sup> Includes standardized turmeric extracts with high levels of curcumin.

<sup>b</sup> Excludes OTC drugs that contain psyllium.

<sup>c</sup> Includes products that contain oregano oil and oregano leaf tinctures.

<sup>d</sup> Quercetin is a flavonoid found in various plants, such as onions (*Allium cepa*) and berries.

<sup>e</sup> Includes three *Echinacea* species: *E. angustifolia*, *E. pallida*, and *E. purpurea*.

<sup>f</sup> Blue-green algae belong to the phylum Cyanobacteria.

<sup>g</sup> Resveratrol is an antioxidant found in various plants, such as grapes (*Vitis vinifera*), berries, and Japanese knotweed (*Polygonum cuspidatum*) roots.

<sup>h</sup> Red yeast rice is fermented with the yeast *Monascus purpureus*.



with NSAIDs alone. They suggested that “Drug combinations containing curcumin may have the dual effect of enhancing efficacy and reducing adverse reactions.”<sup>26</sup>

A 2021 meta-analysis and systematic review of turmeric and curcumin for arthritic conditions included 29 RCTs with 2,396 total participants. The authors reported that turmeric extract and curcumin were safe and reduced the severity of inflammation and pain in people with each of the five types of arthritis assessed (i.e., ankylosing spondylitis, rheumatoid arthritis, osteoarthritis, juvenile idiopathic arthritis, and gout/hyperuricemia).<sup>27</sup>

Turmeric supplements for cardiovascular health are a small (1.9%) but growing segment of turmeric products sold in natural retail outlets. In vivo and in vitro studies suggest that curcumin may be able to help protect against certain myocardial injuries, and clinical studies have shown that curcumin can have a protective effect on blood vessels.<sup>28</sup> A systematic review and meta-analysis published in 2023 concluded that supplementation with turmeric or curcumin was associated with significant improvements in triglycerides and LDL, HDL, and total cholesterol levels. The review included 64 RCTs, but the authors noted that the evidence was considered to be low quality and the findings should be interpreted with caution.<sup>29</sup>

### Top Sales Growth: Barberry

Sales of barberry (*Berberis vulgaris*, Berberidaceae) supplements in natural retail stores nearly doubled in 2023, totaling \$8,393,680. The 98.3% increase was the strongest sales growth of any of the 40 top-selling supplements in this channel. Consumers spent approximately \$4.2 million more on these supplements in 2023 than in 2022, moving it from the 29th top-selling item in 2022 to the 15th in 2023. Sales of barberry supplements have been growing since at least 2020.

Barberry is a shrub with small, egg-shaped fruits that are red to purple. Native to Asia, the species has naturalized throughout Europe and escaped cultivation in North America, where it is now widely considered an invasive plant.<sup>30</sup> Various preparations of barberry and other *Berberis* species have been used extensively in Ayurveda and TCM dating back at least 3,000 years. In Ayurveda, *Berberis* species have been used traditionally for infections, wound healing, indigestion, and obesity, among other conditions.<sup>31</sup>

Many of barberry’s potential health benefits have been attributed to berberine, a naturally occurring alkaloid in many species of *Berberis* and other genera, including *Coptis* (Ranunculaceae), *Eschscholzia* (Papaveraceae), *Hydrastis* (Ranunculaceae), and *Mahonia* (Berberidaceae). The genus *Berberis* is considered the “most widely distributed natural source” of berberine, with concentrations ranging from 1.6% to 4.3%, depending on plant part and species.<sup>31</sup> Sustainability concerns about berberine-containing species such as



Barberry *Berberis vulgaris*  
Photo ©2024 Steven Foster

goldenseal (*H. canadensis*) have increased the need for alternative sources of this compound, including barberry, goldthread (*C. trifolia*), and Oregon grape (*M. aquifolium*).

In 2023, interest in berberine for its potential weight-loss benefits sharply increased, according to data from Google Trends.<sup>32</sup> On social media platforms such as TikTok and Instagram, berberine was dubbed “Nature’s Ozempic<sup>®</sup>,” referring to the brand name of the popular diabetes drug semaglutide (Novo Nordisk; Bagsværd, Denmark), which is also widely used for weight loss. (Semaglutide prescribed for weight-loss purposes is sold under the brand name Wegovy<sup>®</sup>.) Berberine’s association with Ozempic, prescriptions for which increased 40-fold in the United States from 2018 to 2023,<sup>33</sup> likely helped drive sales of barberry supplements in 2023.<sup>34</sup> While semaglutide has been shown in clinical trials to be remarkably effective for weight loss,<sup>35</sup> berberine’s effects on body weight are less established. A 2020 systematic review of 12 RCTs with 849 total subjects found that berberine supplementation was associated with significant improvements in waist-hip ratio but not body weight, body mass index, or waist circumference.<sup>36</sup>

Based on overall sales, the top three health focuses for barberry supplements in 2023 were blood sugar support (72% of total sales), non-specific (16.1%), and “unknown” (8.8%). According to SPINS, the unknown category includes new products that have not yet been coded with a specific health focus. Barberry supplements in this category nearly doubled in 2023 (by 96.2%), which suggests that many new products entered the market. Products with non-specific health focuses grew by 39.2%. The strongest sales growth was for the cardiovascular health category (143.5%), but this health focus made up less than 2% of total barberry sales. Barberry products for blood sugar support, the largest category of products in terms of total sales, also had significant sales growth of 118.4% in 2023.

According to the US Centers for Disease Control and Prevention (CDC), diabetes affects an estimated 11.6% of the US population — roughly 38.4 million people — and nearly 30% of adults 65 years of age or older.<sup>37</sup> All forms of diabetes (type 1, type 2, and gestational) involve an impaired ability to produce or use insulin, an essential hormone that regulates the amount of glucose (a type of sugar) in the blood. High blood sugar levels can lead to significant health issues over time, including heart disease, vision loss, and kidney disease.<sup>38</sup>

The effects of berberine supplementation on measures of glycemic control (i.e., blood sugar regulation) have been the subject of hundreds of human studies. The large amount of clinical trial data has led researchers to conduct several umbrella meta-analyses (a meta-analysis of previously published meta-analyses) in recent years. One such paper, published in February 2024, reviewed 11 meta-analyses on berberine for glycemic control and inflammatory biomarkers in people with metabolic disorders such as diabetes. The authors found that berberine supplementation was effective in reducing levels of fasting blood glucose, hemoglobin A1C, and insulin, as well as several inflammatory biomarkers (e.g., interleukin-6 and C-reactive protein).<sup>39</sup>

A separate umbrella meta-analysis published in 2023 on a wider range of health outcomes similarly concluded that berberine could significantly affect blood glucose levels, insulin resistance, and inflammatory biomarkers, as well as other factors (e.g., blood lipids and body parameters). The authors of the review cautioned that berberine supplementation was associated with gastrointestinal side effects such as constipation and diarrhea and emphasized the need for additional, higher-quality studies to confirm the findings.<sup>40</sup>

### Other Sales Increases

Six other top-selling ingredients in the 2023 natural expanded channel had sales increases greater than 20%: mushrooms – other (+31.0%), milk thistle (*Silybum marianum*, Asteraceae; +26.0%), algae – other (+24.4%), black cumin (*Nigella sativa*, Ranunculaceae; +23.7%), beet root (+22.5%), and kava (*Piper methysticum*, Piperaceae; +22.5%). SPINS data include sales of certain well-known mushroom (e.g., reishi; *Ganoderma lucidum*, Ganodermataceae) and algae (e.g., kelp; species in the taxonomic order Laminariales) ingredients. The “other” designation is a catch-all term that is used for sales of ingredients without their own category.

### Sales Decreases

Only two of the top 40 ingredients in this channel had sales decreases greater than 20% in 2023: quercetin (–30.8%) and elder berry (–20.1%).

## DIRECT SALES

Direct sales of herbal supplements increased by 5.3% in 2023, according to NBJ data. This follows a brief drop in direct sales in 2022 of 5.1% — the first decrease in this market channel since 2008. The 5.3% growth in 2023 is the second lowest sales increase in more than a decade (since 2011). Direct sales had double-digit growth from 2017 to 2021, with the largest sales increases of 23.7% and 15.7% occurring in 2020 and 2021, respectively.

NBJ’s direct sales channel includes online sales from major retailers (e.g., Amazon and Walmart), as well as sales from health practitioners, multi-level marketing companies, and direct media (TV, radio, and print). Direct sales of herbal supplements have accounted for the largest percentage of sales in NBJ’s three market channels since at least 2005, and in 2023, direct sales were more than the combined sales in both the mass market channel and the natural, health food, and specialty channel.

## SALES BY PRODUCT TYPE: SINGLE VS. COMBINATION

Annual sales of combination herbal supplements have been growing at a higher rate than sales of single-herb supplements since 2011, with one exception in 2022 when sales of both product types declined. This general trend continued in 2023, with sales of combination formulas growing by 5.7% compared to the 3.3% sales growth of single-herb supplements.

Although sales of single-herb supplements previously accounted for a much higher percentage of overall sales, this is no longer the case. In 2023, the market shares of the two product types differed by less than three percentage points: 48.9% (totaling \$6.134 billion) for combination formulas and 51.1% (\$6.417 billion) for single-herb supplements.

As noted in previous *HerbalGram* Herb Market Reports, combination formulas contain multiple herbs that may work together to support a general health function or related functions. A combination supplement marketed for cardiovascular health, for example, may contain herbs with anti-inflammatory properties and other ingredients traditionally used for blood pressure support.<sup>41</sup> Single-herb supplements tend to have more specific uses and often more than one. For example, saw palmetto (*Serenoa repens*, *Arecaceae*) fruit supplements often are marketed for prostate health benefits and hair growth, among other uses.<sup>42</sup>

## CONCLUSION

The US herbal supplements market has fluctuated, sometimes unpredictably, since the beginning of the COVID-19 pandemic. In just a four-year period, sales of these products experienced two years of the highest recorded growth in 2020 and 2021, the first decrease in spending in nearly two decades in 2022, and the weakest sales growth in more than a decade in 2023. The slight sales decrease in 2022 suggested that the market may be normalizing after two years of record-breaking sales, and the return to modest sales growth of 4.4% in 2023 appears to lend support to this idea.

Other signs of normalcy can be inferred from the 2023 sales figures. The top-selling herbal supplement ingredients in the mainstream and natural expanded channels in 2023 (psyllium and turmeric, respectively) remained the same as in 2022, as did most of the top 40 ingredients in both channels. Several recent sales trends also continued in 2023, including declining sales of CBD and immune health ingredients such as elder berry. Further, sales of products with certain health focuses such as cardiovascular and cognitive health saw additional gains in 2023, as consumers continue to prioritize products for healthy aging.<sup>43</sup>

As research into the health effects of medicinal plants and fungi continues, and mechanisms of action are better understood, some ingredients with established uses are being marketed for different, related uses and to a wider

**Table 6. Total US Retail Sales of Herbal Supplements by Type (Single vs. Combo)**

	Total Sales	% Total Sales	% Change
<b>2023</b>			
Single Herbs	\$6.417 billion	51.1%	3.3%
Combination Herbs	\$6.134 billion	48.9%	5.7%
<b>2022</b>			
Single Herbs	\$6.214 billion	51.7%	-2.3%
Combination Herbs	\$5.803 billion	48.3%	-1.3%
<b>2021</b>			
Single Herbs	\$6.360 billion	52.0%	5.8%
Combination Herbs	\$5.881 billion	48.0%	14.0%
<b>2020</b>			
Single Herbs	\$6.009 billion	53.8%	11.5%
Combination Herbs	\$5.159 billion	46.2%	24.6%
<b>2019</b>			
Single Herbs	\$5.390 billion	56.6%	6.3%
Combination Herbs	\$4.139 billion	43.4%	11.7%
<b>2018</b>			
Single Herbs	\$5.072 billion	57.8%	6.6%
Combination Herbs	\$3.705 billion	42.2%	12.4%
<b>2017</b>			
Single Herbs	\$4.759 billion	59.1%	5.6%
Combination Herbs	\$3.298 billion	40.9%	11.9%
<b>2016</b>			
Single Herbs	\$4.505 billion	60.5%	6.1%
Combination Herbs	\$2.947 billion	39.5%	10.1%
<b>2015</b>			
Single Herbs	\$4.245 billion	61.3%	5.5%
Combination Herbs	\$2.677 billion	38.7%	10.7%
Source: Nutrition Business Journal			

range of consumers. Beet root supplements, for example, once used primarily among athletes for potential performance benefits, are finding new marketing opportunities in the cardiovascular health and energy categories. Social media also continues to drive sales of some ingredients. The impact was perhaps most evident in the near-doubling of barberry supplement sales in the natural expanded channel in 2023, when berberine was promoted by some as the next “magic pill” for weight loss.<sup>44</sup>

The 4.4% increase of herbal supplement sales in 2023 was undoubtedly a welcome development in this industry. If annual sales continue to rise, it remains to be seen whether such growth will be reminiscent of the modest increases seen in the first decade of the 2000s or a return to the more robust sales growth of the 2010s. HG



*Bacopa monnieri*  
Photo ©2024 Steven Foster

## References

- Engles G, Brinckmann J. Psyllium: *Plantago ovata* (*P. ispaghula*), *P. afra* (*P. psyllium*), and *P. indica* (*P. arenaria*). *HerbalGram*. 2018;117:8-17. Available at: [www.herbalgram.org/resources/herbalgram/issues/117/table-of-contents/hg117-herbprofile/](http://www.herbalgram.org/resources/herbalgram/issues/117/table-of-contents/hg117-herbprofile/). Accessed August 9, 2024.
- What is a botanical drug? US Food and Drug Administration website. Available at: [www.fda.gov/about-fda/center-drug-evaluation-and-research-cder/what-botanical-drug](http://www.fda.gov/about-fda/center-drug-evaluation-and-research-cder/what-botanical-drug). Accessed August 9, 2024.
- 21 CFR Parts 201 and 310: Laxative Drug Products for Over-the-Counter Human Use; Psyllium Ingredients in Granular Dosage Forms. US Food and Drug Administration website. Available at: [www.govinfo.gov/content/pkg/FR-2007-03-29/pdf/E7-5740.pdf](http://www.govinfo.gov/content/pkg/FR-2007-03-29/pdf/E7-5740.pdf). Accessed August 9, 2024.
- Zhu R, Lei Y, Wang S, et al. *Plantago* consumption significantly reduces total cholesterol and low-density lipoprotein cholesterol in adults: A systematic review and meta-analysis. *Nutr Res*. 2024;126:123-137. Available at: <https://pubmed.ncbi.nlm.nih.gov/38688104/>. Accessed August 9, 2024.

5. Gholami Z, Paknahad Z. The beneficial effects of psyllium on cardiovascular diseases and their risk factors: Systematic review and dose-response meta-analysis of randomized controlled trials. *J Funct Food*. 2023;111:105878. Available at: [www.sciencedirect.com/science/article/pii/S1756464623004784](http://www.sciencedirect.com/science/article/pii/S1756464623004784). Accessed August 9, 2024.
6. van der Schoot A, Drysdale C, Whelan K, Dimidi E. The effect of fiber supplementation on chronic constipation in adults: An updated systematic review and meta-analysis of randomized controlled trials. *Am J Clin Nutr*. 2022; 116:953-969. Available at: [www.ncbi.nlm.nih.gov/pmc/articles/PMC9535527/pdf/nqac184.pdf](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC9535527/pdf/nqac184.pdf). Accessed August 9, 2024.
7. Peters V, Dijkstra G, Campmans-Kuijpers MJE. Are all dietary fibers equal for patients with inflammatory bowel disease? A systematic review of randomized controlled trials. *Nutr Rev*. 2022;80(5):1179-1193. Available at: <https://pubmed.ncbi.nlm.nih.gov/34486663/>. Accessed August 9, 2024.
8. Bauman H. Food as Medicine: Beets (*Beta vulgaris*, Chenopodiaceae). HerbalEGram. 2016;13(1). Available at: [www.herbalgram.org/resources/herbalegram/volumes/volume-13/number-1-january/food-as-medicine-beets/food-as-medicine/](http://www.herbalgram.org/resources/herbalegram/volumes/volume-13/number-1-january/food-as-medicine-beets/food-as-medicine/). Accessed August 9, 2024.
9. Brkić D, Bošnjir J, Bevardi M, et al. Nitrate in leafy green vegetables and estimated intake. *Afr J Tradit Complement Altern Med*. 2017;14(3):31-41. Available at: [www.ncbi.nlm.nih.gov/pmc/articles/PMC5412236/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5412236/). Accessed August 26, 2024.
10. Tan ML, Hamid SBS. Beetroot as a potential functional food for cancer chemoprevention, a narrative review. *J Cancer Prev*. 2021;26(1):1-17. Available at: <https://pubmed.ncbi.nlm.nih.gov/33842401/>. Accessed August 9, 2024.
11. Search terms: "Beet root" and "energy." PubMed website. Available at: [https://pubmed.ncbi.nlm.nih.gov/?term=beetroot+energy&filter=pubt.clinicaltrial&filter=datasearch.y\\_5&filter=hum\\_ani.humans&sort=date](https://pubmed.ncbi.nlm.nih.gov/?term=beetroot+energy&filter=pubt.clinicaltrial&filter=datasearch.y_5&filter=hum_ani.humans&sort=date). Accessed August 9, 2024.
12. Swartz MC, Allen K, Deer RR, Lyons EJ, Swartz MD, Clifford T. A narrative review on the potential of red beetroot as an adjuvant strategy to counter fatigue in children with cancer. *Nutrients*. 2019;11(12):3003. Available at: [www.ncbi.nlm.nih.gov/pmc/articles/PMC6949985/pdf/nutrients-11-03003.pdf](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC6949985/pdf/nutrients-11-03003.pdf). Accessed August 9, 2024.
13. Evangelista JF, Meirelles CM, Aguiar GS, Alves R, Matsuura C. Effects of beetroot-based supplements on muscular endurance and strength in healthy male individuals: A systematic review and meta-analysis. *J Am Nutr Assoc*. 2024;43(1):77-91. Available at: <https://pubmed.ncbi.nlm.nih.gov/37167368/>. Accessed August 9, 2024.
14. Jedrejko M, Jedrejko K, Gómez-Renaud VM, Kała K, Muszynska B. Exploring the impact of alternative sources of dietary nitrate supplementation on exercise performance. *Int J Mol Sci*. 2024;25(3650). Available at: [www.ncbi.nlm.nih.gov/pmc/articles/PMC11012081/pdf/ijms-25-03650.pdf](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC11012081/pdf/ijms-25-03650.pdf). Accessed August 9, 2024.
15. Ortega RP. Beet juice gains traction as an evidence-based aid for athletes. *The Washington Post*. March 24, 2019. Available at: [www.washingtonpost.com/national/health-science/beet-juice-gains-traction-as-an-evidence-based-aid-for-athletes/2019/03/22/8e93b1cc-45a2-11e9-90f0-0ccfeec87a61\\_story.html](http://www.washingtonpost.com/national/health-science/beet-juice-gains-traction-as-an-evidence-based-aid-for-athletes/2019/03/22/8e93b1cc-45a2-11e9-90f0-0ccfeec87a61_story.html). Accessed August 9, 2024.
16. Dominguez R, Cuenca E, Mate-Munoz JL, et al. Effects of beetroot juice supplementation on cardiorespiratory endurance in athletes. A systematic review. *Nutrients*. 2017;9(1):43. Available at: [www.ncbi.nlm.nih.gov/pmc/articles/PMC5295087/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5295087/). Accessed August 9, 2024.
17. Maughan RJ, Burke LM, Dvorak J, et al. IOC consensus statement: Dietary supplements and the high-performance athlete. *Br J Sports Med*. 2018;52(7):418-419. Available at: <https://bjsm.bmj.com/content/52/7/439>. Accessed August 9, 2024.
18. Baião DS, da Silva DVT, Paschoalin VMF. Beetroot, a remarkable vegetable: Its nitrate and phytochemical contents can be adjusted in novel formulations to benefit health and support cardiovascular disease therapies. *Antioxidants*. 2020;9(10):960. Available at: [www.ncbi.nlm.nih.gov/pmc/articles/PMC7600128/pdf/antioxidants-09-00960.pdf](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC7600128/pdf/antioxidants-09-00960.pdf). Accessed August 9, 2024.
19. Zamani H, de Joode MEJR, Hossein IJ, et al. The benefits and risks of beetroot juice consumption: A systematic review. *Crit Rev Food Sci Nutr*. 2020;61(5):788-804. Available at: <http://www.tandfonline.com/doi/full/10.1080/10408398.2020.1746629>. Accessed August 9, 2024.
20. Barbalho SM, Direito R, Laurindo LF, et al. *Ginkgo biloba* in the aging process: A narrative review. *Antioxidants*. 2022;11(3):525. Available at: [www.mdpi.com/2076-3921/11/3/525](http://www.mdpi.com/2076-3921/11/3/525). Accessed August 9, 2024.
21. Bejar E. Adulteration of turmeric (*Curcuma longa*) root and rhizome, root and rhizome extracts. Botanical Adulterants Prevention Bulletin. Austin, TX: ABC-AHP-NCNPR Botanical Adulterants Prevention Program; 2018. Available at: [www.herbalgram.org/resources/botanical-adulterants-prevention-program/adulterants-bulletins/turmeric-bulletin-may-2018/](http://www.herbalgram.org/resources/botanical-adulterants-prevention-program/adulterants-bulletins/turmeric-bulletin-may-2018/). Accessed August 9, 2024.
22. Fuloria S, Mehta J, Chandel A, et al. A comprehensive review on the therapeutic potential of *Curcuma longa* Linn. in relation to its major active constituent curcumin. *Front Pharmacol*. 2022;13:820806. Available at: [www.ncbi.nlm.nih.gov/pmc/articles/PMC8990857/pdf/fphar-13-820806.pdf](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC8990857/pdf/fphar-13-820806.pdf). Accessed August 9, 2024.
23. Omoigui S. The biochemical origin of pain: The origin of all pain is inflammation and the inflammatory response. Part 2 of 3 – Inflammatory profile of pain syndromes. *Med Hypotheses*. 2007;69(6):1169-1178. Available at: [www.sciencedirect.com/science/article/abs/pii/S0306987707004641?via%3Dihub](http://www.sciencedirect.com/science/article/abs/pii/S0306987707004641?via%3Dihub). Accessed August 4, 2024.
24. Eke-Okoro UJ, Raffa RB, Pergolizzi JV, Breve F, Taylor R. Curcumin in turmeric: Basic and clinical evidence for a potential role in analgesia. *J Clin Pharm Ther*. 2018;43(4):460-466. Available at: <https://pubmed.ncbi.nlm.nih.gov/29722036/>. Accessed August 9, 2024.
25. Uddin SJ, Hasan F, Afroz M. Curcumin and its multi-target function against pain and inflammation: An update of pre-clinical data. *Curr Drug Targets*. 2021;22(6):656-671. Available at: <https://pubmed.ncbi.nlm.nih.gov/32981501/>. Accessed August 9, 2024.
26. Zhao J, Liang G, Zhou G. Efficacy and safety of curcumin therapy for knee osteoarthritis: A Bayesian network meta-analysis. *J Ethnopharmacol*. 2023;321:117493. Available at: <https://pubmed.ncbi.nlm.nih.gov/38036015/>. Accessed August 9, 2024.
27. Zeng L, Yang T, Yang K, et al. Efficacy and safety of curcumin and *Curcuma longa* extract in the treatment of arthritis: A systematic review and meta-analysis of randomized controlled trial. *Front Immunol*. 2022;13:891822. Available at: <https://pubmed.ncbi.nlm.nih.gov/35935936/>. Accessed August 9, 2024.
28. Yang C, Zhu Q, Chen Y, et al. Review of the protective mechanism of curcumin on cardiovascular disease. *Drug Des Devel Ther*. 2024;18:165-192. Available at: <https://pubmed.ncbi.nlm.nih.gov/38312990/>. Accessed August 9, 2024.
29. Dehzad MJ, Ghalandari H, Amini MR, Askarpour M. Effects of curcumin/turmeric supplementation on lipid profile: A GRADE-assessed systematic review and dose-response meta-analysis of randomized controlled trials. *Complement Ther Med*. 2023;75:102955. Available at: <https://pubmed.ncbi.nlm.nih.gov/37230418/>. Accessed August 9, 2024.

Dandelion *Taraxacum officinale*  
Photo ©2024 Steven Foster



30. Common barberry. Minnesota Department of Agriculture website. Available at: [www.mda.state.mn.us/plants/pestmanagement/weedcontrol/noxiouslist/commonbarberry](http://www.mda.state.mn.us/plants/pestmanagement/weedcontrol/noxiouslist/commonbarberry). Accessed August 9, 2024.
31. Neag MA, Mocan A, Echeverría J, et al. Berberine: Botanical occurrence, traditional uses, extraction methods, and relevance in cardiovascular, metabolic, hepatic, and renal disorders. *Front Pharmacol*. 2018;9:557. Available at: [www.ncbi.nlm.nih.gov/pmc/articles/PMC6111450/pdf/fphar-09-00557.pdf](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC6111450/pdf/fphar-09-00557.pdf). Accessed August 9, 2024.
32. Berberine; 2023. Google Trends website. Available at: <https://trends.google.com/trends/explore?date=2023-01-01%202023-12-31&geo=US&q=berberine&chl=en>. Accessed August 9, 2024.
33. Sherman J. As Ozempic use skyrockets, UCLA's program for reducing obesity sees rapid growth. February 22, 2024. UCLA Health website. Available at: <http://www.uclahealth.org/news/article/ozempic-program-reducing-obesity>. Accessed August 9, 2024.
34. Lovelace B. What is berberine, the supplement dubbed 'nature's Ozempic' on social media? NBC News website. June 1, 2023. Available at: [www.nbcnews.com/health/health-news/berberine-supplements-what-to-know-benefits-risks-side-effects-rcna87065](http://www.nbcnews.com/health/health-news/berberine-supplements-what-to-know-benefits-risks-side-effects-rcna87065). Accessed August 9, 2024.
35. Garvey WT, Batterham RL, Bhatta M, et al. Two-year effects of semaglutide in adults with overweight or obesity: The STEP 5 trial. *Nat Med*. 2022;28:2083-2091. Available at: [www.nature.com/articles/s41591-022-02026-4](http://www.nature.com/articles/s41591-022-02026-4). Accessed August 9, 2024.
36. Safari Z, Farrokhzad A, Ghavami A, et al. The effect of barberry (*Berberis vulgaris* L.) on glycemic indices: A systematic review and meta-analysis of randomized controlled trials. *Complement Ther Med*. 2020;51:102414. Available at: <https://pubmed.ncbi.nlm.nih.gov/32507431/>. Accessed August 9, 2024.
37. National Diabetes Statistics Report. US Centers for Disease Control and Prevention website. May 15, 2024. Available at: <https://www.cdc.gov/diabetes/php/data-research/index.html>. Accessed August 9, 2024.
38. Diabetes Basics. US Centers for Disease Control and Prevention website. May 15, 2024. Available at: [http://www.cdc.gov/diabetes/about/index.html#cdc\\_disease\\_basics\\_quick\\_facts\\_callout\\_callout-diabetes-by-the-numbers](http://www.cdc.gov/diabetes/about/index.html#cdc_disease_basics_quick_facts_callout_callout-diabetes-by-the-numbers). Accessed August 9, 2024.
39. Nazari A, Ghotbabadi ZR, Kazemi KS, et al. The effect of berberine supplementation on glycemic control and inflammatory biomarkers in metabolic disorders: An umbrella meta-analysis of randomized controlled trials. *Clin Ther*. 2024;46(2):e64-e72. Available at: <https://pubmed.ncbi.nlm.nih.gov/38016844/>. Accessed August 9, 2024.
40. Li Z, Wang Y, Xu Q, et al. Berberine and health outcomes: An umbrella review. *Phytother Res*. 2023;37(5):2051-2066. Available at: <https://pubmed.ncbi.nlm.nih.gov/36999891/>. Accessed August 9, 2024.
41. Horne S. Understanding herbal formulas. American Herbalists Guild website. Available at: [www.americanherbalistsguild.com/sites/default/files/Proceedings/horne\\_steven\\_-\\_understanding\\_herbal\\_formulas.pdf](http://www.americanherbalistsguild.com/sites/default/files/Proceedings/horne_steven_-_understanding_herbal_formulas.pdf). Accessed August 9, 2024.
42. Health information: Saw palmetto. National Center for Complementary and Integrative Health website. May 2020. Available at: [www.nccih.nih.gov/health/saw-palmetto](http://www.nccih.nih.gov/health/saw-palmetto). Accessed August 9, 2024.
43. The Rising Demand for Healthy Aging Supplements: A Market Opportunity. Vivion website. Available at: <https://vivion.com/rising-demand-for-healthy-aging-supplements-a-market-opportunity/>. Accessed August 9, 2024.
44. Fairbank R. Are claims that berberine is 'nature's Ozempic' overblown? *National Geographic* website. September 7, 2023. Available at: [www.nationalgeographic.com/premium/article/berberine-nature-plant-ozempic](http://www.nationalgeographic.com/premium/article/berberine-nature-plant-ozempic). Accessed August 9, 2024.



## HerbalGram Is 40+! We're Announcing ABC's **HERBAGRAM40**

A yearslong celebration of *HerbalGram's*  
40th anniversary and ABC's robust  
future.

Learn more and join us in envisioning and  
creating the next 40+ years of *HerbalGram*  
and ABC's unique nonprofit mission.

For more information, scan the QR code or visit:

[www.herbalgram.org/get-involved/  
herbalgram-40th-anniversary/](http://www.herbalgram.org/get-involved/herbalgram-40th-anniversary/)



# SOLUTIONS FOR HEALTHY AGING, WELLBEING AND BEAUTY



## HEALTHY AGING, SPORTS NUTRITION, MENTAL WELLNESS, BEAUTY FROM WITHIN

Patented pomegranate fruit extract, standardized in punicalagins.



## ANTIOXIDANT AND HEALTHY CARDIOVASCULAR FUNCTIONS

Patented olive fruit extract, water soluble and oil dispersible, standardized in hydroxytyrosol.



## POSTPRANDIAL GLUCOSE MANAGEMENT

Patented fig fruit extract, standardized in abscisic acid.



## HOLISTIC DIGESTIVE AND MICROBIOME HEALTH

Artichoke bud extract, standardized in caffeoylquinic acids and inulin.



## BIOAVAILABLE CITRUS FLAVONOIDS

Lemon fruit extract, standardized in eriocitrine.



## HEALTHY MUSCLE FUNCTION

Spinach leaf extract, standardized in 20-hydroxyecdysone.



Premium Botanical Extracts Since 1971



**MEDITERRANEAN™**  
fruit and vegetable extracts

Water Only  
Extraction

Vertically  
Integrated

Locally  
Sourced

Evidence-  
Based

**VEGAN**

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.

All information given in this documentation reflects published current knowledge. EUROMED disclaims any responsibility for the suitability of this information for products intended by the user. The suggestions given do not release EUROMED's customers and the user of the products from evaluating the individual products as to their legal compliance. The user of the product is solely responsible for compliance with all laws and regulations applying to the use of the products.

This material is intended for professionals only.