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NOTIFICATION OF HEALTH CLAIMS
BASED ON AUTHORITATIVE STATEMENTS

Alliance for Natural Health USA ("ANH") together with Living Fuel International, Inc., Health Ranger Store, Inc., and Sanacor International, Inc. and Evolution Nutraceuticals, Inc. dba Cardio Miracle (collectively, the parties) hereby submit this Notification for Health Claims Based on Authoritative Statements pursuant to 21 USC 343(r)(3)(C) in accordance with the filing instructions contained in FDA, "Guidance for Industry: Notification of a Health Claim or Nutrient Content Claim Based on an Authoritative Statement of a Scientific Body (June 1998)" (hereinafter, 1998 Guidance). Correspondence to the parties concerning this notice should be addressed to the undersigned lead counsel. Under the provisions of 21 USC 343(r)(3)(C)(ii), the agency must act on this notice no later than 120 days from the date of submission, i.e., on or before December 31, 2025.

As explained below, if the FDA chooses not to approve the claims requested under 21 USC 343(r)(3)(C), it must allow them as a matter of constitutional right under the First Amendment to the United States Constitution because the FDA lacks authority to deny private parties the right to communicate on labels and in labeling the very same information it communicates to the public concerning the nutrient-disease associations at issue here.

Analysis under each of these legal constraints on FDA authority is required without deference to prior agency interpretation following the Supreme Court's decision in *Loper Bright Enterprises v. Raimondo,* 603 U.S. 369 (2024).

Summary

Each of the 118 noticed health claims (Exhibit 1) for use on the labels and in the labeling of the foods specified herein (Exhibit 1) are claims subject to the provisions of 21 USC 343(c)(3)(C) because they are based on authoritative statements of scientific bodies of the United States Government with official responsibility for public health protection or research directly relating to human nutrition. The authoritative statements in Exhibit 1 have been made and published by the National Institutes for Health (NIH) and the Centers for Disease Control and Prevention (CDC). The science relevant to these claims are provided in Exhibit 4. The relevant, published science relied upon by these agencies in support of the authorities' respective publications of these authoritative statements is included in the references (URLs) to the agency publications containing the authoritative statements from which the respective health claims are derived (Exhibit 2).

In its 1998 Guidance, FDA interpreted 21 USC 343(r)(3)(C) at odds with the plain meaning of the statute's terms, the legislative history underlying that section of the code, and the canons of statutory construction. In the Guidance, FDA required health claims based on authoritative statements to be subjected to the requirements of 21 USC 343(r)(3)(B)(i) (hereinafter, Significant Scientific Agreement standard or SSA) when Congress in Section 343(r)(3)(C) plainly intended claims based on authoritative statements to be exempt from the SSA requirement. The agency's interpretation contradicts the statute which exempts health claims based on authoritative statements from SSA review in advance of market entry and permits continuous use of the claim in the market until such time, if ever, when the Secretary promulgates a rule following notice and comment rulemaking that modifies or revokes the claim or a federal court in an enforcement action acts against the claim. *Contrast* 21 USC 343(r)(3)(C) ("a claim of the type described in subparagraph (1)(B) which is not authorized by the Secretary in a regulation promulgated in accordance with clause (B) ***shall be authorized and may be made with respect to a food*** if—") *with* 21 USC 343(r)(3)(D) ("A claim submitted under the requirements of clause (C) may be made ***until***—") (Emphasis added).

The 1998 Guidance also contradicts the legislative history on point, which confirms that 21 USC(r)(3)(C) was meant to be an alternative to, not a subset of, SSA statutory review. See H.R. Rep. No. 105-399, 105th Cong., 1st Sess. (1997); S. Rep. No. 105-43, 105th Cong., 1st Sess. (1997).

Moreover, FDA demands that conditions precedent beyond those listed in the statute be satisfied before a health claim filed under subpart (C) can be authorized, yet neither the statute nor the legislative history gives FDA authority to impose those additional conditions. Under *Loper Bright Enterprises v. Raimondo*, 603 U.S. 369, 144 S.Ct. 2244 (2024), the *ultra vires* doctrine, and the canons of statutory construction, FDA has no statutory authority to require conditions be satisfied beyond those specified in the statute. See, e.g., *United States v. Great Northern Ry.,* 287 U.S. 144, 154 (1932); Unif. Statute & Rule Construction Act § 19 (1995) ("*Primacy of Text.* The text of a statute or rule is the primary, essential source of its meaning"); Justinian's Digest 32.69 (*A verbis legis non est recedendum*) ("Do not depart from the words of the law").

For the reasons explained in this submission, the parties ask FDA to adhere to the plain and intended meaning of the statute in accordance with the command of *Loper Bright Enterprises*, the *ultra vires* doctrine, and the canons of statutory construction in assessing this notification and to avoid application of the 1998 Guidance requirements that exceed and contradict the statute. In the context of noticed claims pursuant to 21 USC 343(r)(3)(C), FDA lacks the authority to require SSA compliance before authorizing the claims for entry into the market. *Contrast* 21 USC 343(r)(3)(C) ("a claim of the type described in subparagraph (1)(B) which is not authorized by the Secretary in a regulation promulgated in accordance with clause (B) shall be authorized and may be made with respect to a food if—") *with* 21 USC 343(r)(3)(D) ("A claim submitted under the requirements of clause (C) may be made until—"). FDA also lacks the authority to demand satisfaction of conditions beyond those required by the statute because Congress did not delegate to FDA authority so to do. See *Loper Bright Enterprises* overturning *Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 468 U.S. 837 (1984).

In the advent of *Loper Bright Enterprises*, FDA is no longer entitled to judicial deference in favor of agency interpretations that fail to track the plain and intended meaning of statutory language or that impose requirements beyond those required by the statute. Instead, in reviewing this notification, FDA must adhere to the plain and intended meaning of the statute and abide by the applicable canons of statutory construction. *Loper Bright Enterprises,* 144 S.Ct. at 2268 ("It . . . makes no sense to speak of a 'permissible' interpretation that is not the one the court, after applying all relevant interpretive tools, concludes is best").

In this submission, the parties satisfy the statutory requirements for market entry of the health claims noticed herein, as prescribed by 21 USC 343(r)(3)(C). Accordingly, the agency must authorize all of the health claims specified in Exhibit 1 to enter the market on the labels and in the labeling of the corresponding dietary supplements and foods identified.

By taking the requested action, FDA will enable consumers at the point of sale to make food purchasing decisions based on label claims concerning the effect of nutrients at levels in the dietary supplements and foods on reduction in the risk of disease. Consumers who make dietary supplement and food choices based on that information may reduce disease occurrence, extend healthy lifespans, lower burdens on health care resources, and expand individual control over their biological destinies. These ends are in ultimate fulfillment of purposes underlying the First Amendment. See, e.g., *Virginia State Bd. of Pharmacy v. Virginia Citizens Consumer*

Council, Inc., 425 U.S. 748, 765 (1976) ("So long as we preserve a predominantly free enterprise economy, the allocation of our resources in large measure will be made through numerous private economic decisions. It is a matter of public interest that those decisions, in the aggregate, be intelligent and well informed. To this end the free flow of information is indispensable.").

There is an enormous pent-up demand among health-conscious consumers for trusted, authoritative scientific information about nutrients and other natural substances that have been scientifically demonstrated to reduce the risk of disease (Exhibits 1, 2 and 4). Were it not for barriers to market entry erected previously by FDA, consumers would presently be equipped at the point of sale with authoritative information about nutrient-disease risk reduction. Such information, published by scientific bodies of the United States federal government, would be widely known, and would help U.S. consumers make health enhancing choices in the food market, with a reasonable expectation that such choices would result in a reduction in the incidence of disease. Those barriers, inefficiencies, and acts of suppression were the subject of criticism of this agency in the legislative history underlying 21 USC 343(r)(3)(C) and gave rise to the authoritative statement notice exception to the SSA requirement.

Survey data confirms that the label and labeling of foods and dietary supplements is the primary source for consumers in making decisions about which foods to buy. See, e.g., Muhammad Zeeshan Zafar, et. al., "The Impact of Interpretive Packaged Food Labels on Consumer Purchase Intention: The Comparative Analysis of Efficacy and Inefficiency of Food Labels," *Int. J. Environ Res. Public Health*, 2022 Nov; 19 (22): 15098 ("The primary source of communication between consumers and organizations is food labeling, which often influences consumers' purchase decisions," citing M. J. Moreira, et. al., "Evaluation of food labeling usefulness for consumers," *Int. J. Consum. Stud.* 2019; 43: 327-334; J. L. Pomeranz, et. al., "Mandating front-of-package food labels in the US – What are the First Amendment obstacles?" *Food Policy*, 2019: 85: 101722. Consequently, there is an urgent need for release of the health claims sought here so consumers may make better informed choices conducive to better health outcomes, taking into account statements heretofore made elsewhere by the government concerning foods and dietary ingredients but never allowed into the market itself by speech barriers erected by this agency.

Moreover, grant of this petition will be in substantial fulfillment of the Make America Healthy Again (MAHA) agenda, supported by a Presidential Executive Order issued on February 13, 2025, namely "Establishing the President's Make America Health Again Commission". There is a general consensus in the scientific community that dietary choices affect the risk of disease and longevity as much as, if not more than, any other environmental choice a person can make (Willett WC, Stampfer MJ. Current evidence on healthy eating. *Ann. Rev. Publ. Health* 2013; 34:77–95; refer also to the scientific publications relied on by U.S. agencies for the authoritative statements, Exhibit 4).

To achieve the goal of reversing the chronic disease epidemic in the United States, consumers must be armed with information at the point of sale in food and dietary supplement markets to exercise informed choice in favor of better health outcomes. Conversely, maintenance of the regime of prior restraint now regnant at FDA will postpone indefinitely, if

not prevent altogether, complete achievement of the Make America Healthy Again (MAHA) agenda.

This petition seeks approval of 118 health claims, which if allowed will enable a broad diffusion of essential health information to reach consumers as never before in American history. That extraordinary infusion of health information is likely to have the most profound effect on the exercise of healthy choice food and dietary supplement options by consumers, redounding not only to individual benefit in lessened incidence in disease and greater longevity but to the overall benefit of the nation as reduced dependency on drugs, hospitalization, and health care will reduce demand on public resources and better position the nation to achieve MAHA health goals.

FDA's denial of the parties' use on labels and in labeling of the very information the government publishes violates the parties' First Amendment rights. The speech burden is content-based (affecting all nutrient-disease relationship claims that arise in publications of scientific bodies of the United States Government with official responsibility for public health protection or research directly relating to human nutrition) and is speaker-based (affecting all non-government speakers who are regulatees of FDA). As explained below, as a content-based and speaker-based ban on the parties' free speech, the agency's burden on the communication of health claims based on authoritative statements is presumptively unconstitutional under the First Amendment. The very fact that the government itself has published the information to the public concerning the nutrient-disease association belies any contention by this agency that the information is inherently misleading and suppressible at FDA's whim or caprice or that somehow consumers are either too ignorant or too gullible to comprehend the information. In the end, the First Amendment is more than a prohibition against government enactment of laws restricting protected speech, it is a guarantee of individual sovereignty, entrusting to each American citizen, not government, the power to decide what is in his or her own best interests. As the Supreme Court reasoned in *44 Liquormart, Inc. v. Rhode Island*, 517 U.S. 484, 497 (1996) (quoting *Virginia Bd. of Pharmacy v. Virginia Citizens Consumer Council, Inc.*, 423 U.S. 748, 765 (1976):

> There is, of course, an alternative to this highly paternalistic approach. That alternative is to assume that this information is not in itself harmful, that people will perceive their own best interests if only they are well enough informed, and that the best means to that end is to open the channels of communication rather than to close them. If they are truly open, nothing prevents the 'professional' pharmacist from marketing his own assertedly superior product, and contrasting it with that of the low-cost, high-volume prescription drug retailer. But the choice among these alternative approaches is not ours to make or the Virginia General Assembly's. It is precisely this kind of choice, between the dangers of suppressing information, and the dangers of its misuse if it is freely available, that the First Amendment makes for us.

Based on the statutory and constitutional reasons explained in detail below and the notification supplied herein, the parties ask the FDA to act as soon as possible to authorize each of the 118 health claims sought herein to enter the market on food labels and in food labeling.

The Parties

Alliance for Natural Health USA is a 501(c)(4) non-profit organization that works nationally to both promote sustainable and regenerative health care and protect individual freedom of choice through proactive policy advocacy and public education. ANH protects access to healthcare by lobbying Congress and state legislatures; acting as a government watchdog; filing comments in rulemakings; educating the public, press, and decision-makers about threats to consumer access to healthcare options, and initiating suits to ensure access.

Living Fuel International, Inc., founded in 2001 and headquartered in Tampa, Florida, is a health and wellness company specializing in nutrient-dense, plant-based meal replacement products designed to support optimal human performance and longevity. Its flagship offerings are formulated with over 90 essential nutrients—including vitamins, minerals, antioxidants, other botanicals, enzymes, and probiotics—to provide comprehensive nutritional support in a single serving. Committed to evidence-based formulations and high-quality, non-GMO ingredients, Living Fuel positions itself as a leader in functional nutrition, aiming to deliver measurable health benefits through its scientifically crafted superfood products. Claims for which Living Fuel International, Inc., seeks use on the labels and in the labeling of its products are identified in Exhibit 3.

The Health Ranger Store, Inc. established in 2012 by Mike Adams, is a U.S.-based online retailer specializing in organic, non-GMO, and lab-verified health products, including supplements, superfoods, and personal care items. All products undergo rigorous testing at CWC Labs, an ISO-accredited analytical laboratory, to ensure purity and potency, with certifications such as USDA Organic and Non-GMO Project Verified. Committed to transparency and sustainability, the company aims to provide consumers with clean, effective, and ethically sourced health solutions. Claims for which The Health Ranger Store, Inc. seeks use on the labels and in the labeling of its products are identified in Exhibit 3.

Sanacor International, Inc. and Evolution Nutraceuticals, Inc. dba Cardio Miracle is a Utah-based health supplement company founded in 2013 specializing in advanced nitric oxide and cardiovascular support formulations. Its flagship product combines key nutrients such as L-arginine, L-citrulline, vitamins D and K, and antioxidants to support endothelial function, circulation, and overall cardiovascular health. As a petitioner for health claims at the FDA, Cardio Miracle is committed to grounding its applications in emerging scientific evidence and advancing public access to nutraceuticals that align with optimal health outcomes. Claims for which Cardio Miracle seeks use on the labels and in the labeling of its products are identified in Exhibit 3.

Accordingly, each of the health claims noticed herein is sponsored by one or more of the commercial petitioners named above, as shown in Exhibit 3.

The Governing Statute for Health Claims Based on Authoritative Statements of Scientific Bodies of the U.S. Government with Official Responsibility for Public Health Protection or Research Directly Relating to Human Nutrition: 21 USC 343(r)(3)(C)

The Food and Drug Administration Modernization Act, codified at 21 USC 343(r)(3)(C), establishes an avenue for FDA to authorize market entry of certain health claims on food labels and in food labeling without satisfying the requirements of 21 USC 343(r)(B)[1].

The statute provides that "notwithstanding the provisions" of 343(r)(B) (i.e., the Significant Scientific Agreement, or SSA, standard), a claim of the type described in subparagraph (1)(B) (i.e., a nutrient-disease relationship claim or health claim) "which is not authorized by the Secretary in a regulation promulgated in accordance with clause (B)" (i.e., under the SSA standard) "**shall be authorized and may be made with respect to a food[2] if**"

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[1] 21 USC 343(r)(3)(B)(i), which establishes the so-called Significant Scientific Agreement standard (SSA), reads in pertinent part:

> The Secretary shall promulgate regulations authorizing claims of the type described in subparagraph (1)(B) only if the Secretary determines, based on the totality of publicly available scientific evidence (including evidence from well-designed studies conducted in a manner which is consistent with generally recognized scientific principles and procedures), that there is significant scientific agreement among experts qualified by scientific training and experience to evaluate such claims, that the claim is supported by such evidence.

21 USC 343(r)(1)(B) referenced therein reads in pertinent part:

> **(1)** . . . if it is a food intended for human consumption which is offered for sale and for which a claim is made in the label or labeling of the food which expressly or by implication—
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> * * * *
>
> **(B)** characterizes the relationship of any nutrient which is of the type required by paragraph (q)(1) or (q)(2) to be in the label or labeling of the food to a disease or a health-related condition unless the claim is made in accordance with subparagraph (3) or (5)(D).

A statement of the type required by paragraph (q) that appears as part of the nutrition information required or permitted by such paragraph is not a claim which is subject to this paragraph and a claim subject to clause (A) is not subject to clause (B).

- [2] In "Food Labeling: Use on Dietary Supplements of Health Claims Based on Authoritative Statements (Proposed Rule), 64 FR 3250-3255 (Jan. 21, 1999), https://www.govinfo.gov/content/pkg/FR-1999-01-21/html/99-1365.htm#:~:text=Section%20304%20of%20FDAMA%20permits,nutrient%20levels%20identified%20in%20Sec., the FDA proposed a rule that dietary supplements, a subset of foods within the FDCA, bear health claims based on authoritative statements, thus harmonizing dietary supplement with general "food" regulation consistent with the contextual meaning of the FDCA, which defines dietary supplements as a subset of foods. See 21 USC 321 (ff) ("Except for purposes of paragraph (g) and Section 350f of this title, ***a dietary supplement shall be deemed a food*** within the meaning of this chapter") (emphasis added). FDA never rescinded that proposed rule. See also "Guidance for Industry: Notification of Health Claim and Nutrient Content Claim Based on Authoritative Statement of a Scientific Body" (June 1988), https://www.fda.gov/regulatory-information/search-fda-guidance-documents/guidance-industry-notification-health-claim-or-nutrient-content-claim-based-authoritative-

these conditions are met: (1) the claim is one based on an authoritative statement of a scientific body of the U.S. government with official responsibility for public health protection or research directly relating to human nutrition, 21 USC 343(r)(C)(i), and (2) the person submitting the claim supplies the Secretary with (a) information to show via a concise description that the statement is one from an aforementioned (Exhibits body of the U.S. Government and not an employee of that body acting in his individual capacity; (b) the exact wording of the claim; (c) a copy of the authoritative statement; and (d) a balanced representation of the scientific literature relating to the relationship between the nutrient and a disease or health-related condition to which the claim refers. 21 USC 343(r)(C)(ii). Additionally, the claim must be (d) one that enables consumers to understand the relative significance of the information within the context of a total daily diet.

For each claim sought, the statutorily required information is supplied hereinbelow (Exhibits 1, 2 and 4).

Congress defined an "authoritative statement" as one "published" by a "scientific body of the United States Government with official responsibility for public health protection or research directly relating to human nutrition." 21 USC 343(r)(3)(C)(i). The statute gives as examples the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), the National Academy of Sciences (NAS) or any of its subdivisions. The legislative history for the Act supplies additional examples, including: the National Cancer Institute and the National Heart, Lung, and Blood Institute. The FDA added to these the Surgeon General within the Department of Health and Human Services; the Food and Nutrition Service (FNS); the Food Safety and Inspection Service (FSIS); and the Agricultural Research Service within the Department of Agriculture (ARS).

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statement#:~:text=Finally%2C%20FDA%20believes%20that%20there,r)(5)(D) (explaining that authoritative statements would be allowed on the labels and in the labeling of dietary supplements). The proposed rule and aforementioned reference in the Guidance were the operative at the agency (and used in the assessment of authoritative statement petitions for dietary supplements) until 2024. But in a March 28, 2024 guidance (and without resort to notice and comment rulemaking to reverse the proposed rule of January 21, 1999), FDA did a *volte face*, stating it would not allow health claims based on authoritative statements to be made for dietary supplements, only for conventional foods. See "Label Claims for Conventional Foods and Dietary Supplements" (March 28, 2024), https://www.fda.gov/food/nutrition-food-labeling-and-critical-foods/label-claims-conventional-foods-and-dietary-supplements#:~:text=FDAMA%20does%20not%20include%20dietary,dietary%20supplements%20at%20this%20time. Because by FDA's own admission a "guidance" has no legally binding effect, the announcement does not preclude this submission or negate the prior proposed rule. Moreover, given the repeated reference to foods within the statutory definition of a dietary supplement in 21 USC 321(ff), the agency lacks statutory authority to construe the term "food" to exclude dietary supplements (and the dietary ingredients subsumed within that definition); that interpretation would be suboptimal and contrary to contextual meaning, thus violating *Loper-Bright Enterprises*. In the absence of statutory language and of clearly expressed congressional intention, FDA has no legal basis for excluding dietary supplements from authoritative statement claims. To prohibit dietary supplements from having access to such claims would be an act of content-based and speaker-based discrimination in violation of the First Amendment. Moreover, it would violate a major canon of statutory construction, which canon requires that if a statute is susceptible to two interpretations, one of which would render it unconstitutional and the other valid, the interpretation that upholds the statute's constitutionality must be adopted. See *Ashwander v. Tennessee Valley Authority,* 297 U.S. 288 (1936).

Congress additionally required that the authoritative statement (e) be "currently in effect." 21 USC 343 (r)(3)(C)(i).

In 21 USC 343(r)(3)(C), Congress required the Secretary--"notwithstanding the provisions" of 343(r)(B) (i.e., the Significant Scientific Agreement, or SSA, standard)--to authorize health claims if based on authoritative statements of scientific bodies of the United States Government with official responsibility for public health protection or research directly relating to human nutrition. In 21 USC 343(r)(3)(D), Congress restricted the Secretary's power to limit this class of health claims to the post-authorization context following notice and comment rulemaking as to the claim and via regulation promulgated, or by district court order in an enforcement proceeding. In 21 USC 343(r)(3)(D), the statute reads:

> **(D)** A claim submitted under the requirements of clause (C) ***may be made until***—
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> **(i)** such time as the Secretary issues a regulation under the standard in clause (B)(i)—
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> **(I)** prohibiting or modifying the claim and the regulation has become effective, or
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> **(II)** finding that the requirements of clause (C) have not been met, including finding that the petitioner has not submitted all the information required by such clause; or
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> **(ii)** a district court of the United States in an enforcement proceeding under subchapter III has determined that the requirements of clause (C) have not been met.

(Emphasis added).

In convoluted logic in its 1998 Guidance, the agency went beyond its statutory remit and read into subpart (C) for authoritative statement health claim authorization an SSA review requirement, despite the fact that Congress excluded that requirement from subpart (C) and limited it to the post health claim authorization context in subpart (D)—applicable therein only following agency rulemaking or a district Court's enforcement order. That power grab served the end of censorship, thus also construing the statute to effect a First Amendment violation.

In its 1998 Guidance FDA thus demanded what Congress disallowed; SSA review for health claim submissions based on authoritative government statements, effectively amending the statute by reinserting the very SSA review requirement into subpart (C) that Congress expressly excluded. That reinterpretation, to the extent it could ever pass muster under *Chevron,* plainly fails muster under *Loper Bright Enterprises* and the applicable canons of statutory construction. The agency interpretation not only contradicts the express exemption from SSA afforded authoritative statements in 21 USC 343 (r)(3)(C)(i), it also contradicts the intended meaning of the subsection as stated in the legislative history.

The Legislative History for 21 USC 343(r)(3)(C) Does Not Allow FDA to Impose the SSA Requirement on Health Claim Notices Based on Authoritative Statements

The legislative history concerning 21 USC 343(r)(3)(C) is contained in U.S. House Report 105-399 (Conf. Report) and U.S. Senate Report 105-43. H.R. Rep. No. 105-399, 105th Cong., 1st Sess. (1997); S. Rep. No. 105-43, 105th Cong., 1st Sess. (1997). In the House Report, the following explanation appears for the amendment to the Food Drug and Cosmetic Act governing health claims based on authoritative statements:

> ***(Sec. 303) allows a health or nutrient content claim not authorized by the Secretary*** if: (1) a U.S. governmental scientific body with public health protection or research responsibility directly relating to human nutrition or the National Academy of Sciences has published an authoritative statement, currently in effect, about the relationship to which the health claim refers or that identifies the nutrient level to which the nutrient claim refers; (2) a person has notified the Secretary; (3) the claim and food are in compliance with certain requirements; and (4) the claim is stated in a way that is an accurate representation of the authoritative statement and in a way that it enables the public to understand the information and its significance. (Emphasis added).

The House Report thus makes clear that a health claim under 21 USC 343(r)(3)(C) is to be allowed ***without authorization from the Secretary*** if based on publications of other federal governmental scientific bodies with public health protection or research responsibility. There is in this history no statement that FDA is given authority to require SSA review or approval as a condition precedent to authorization of health claims based on authoritative statements. Nor is there any reference to an intention to give FDA authority to impose other requirements beyond those specified in the statute's text.

The Senate Report further elucidates the intended meaning. The Senate Report reads in pertinent part:

> 9. the legislation simplifies the approval process for indirect food contact substances and ***provides a more reasonable standard for some health claims.***
>
> …. The legislation also provides for health claims for foods, with premarket notification, when the claims are based on authoritative recommendations by an authoritative scientific body of the U.S. Government such as the National Institutes of Health, the Centers for Disease Control and Prevention, or the National Academy of Sciences.
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> Title VI—Better Allocation of Resources Setting Priorities
>
> Health Claims of Food Products
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> This legislation makes amendments to section 403(r) of the Federal Food, Drug, and Cosmetic Act to authorize truthful, nonmisleading health claims that are based on published authoritative statements of scientific bodies of the U.S. Government with

official responsibility for public health protection or research directly relating to human nutrition.

* * * *

Under existing section 403(r)(3), health claims can be made for food only after FDA issues a regulation authorizing the specific claim. This same preclearance requirement applies to all health claims—from the novel claim, to the claim that would be supported by an authoritative statement of an official public health agency of the Federal Government. ***This procedure is inefficient and fails adequately to benefit from the deliberative processes in which authoritative scientific bodies engage in issuing statements on matters of public health.*** Important Federal public health organizations as part of their official responsibilities, routinely review the scientific evidence pertinent to diet and disease relationships, and publish statements developed through such reviews. ***The Surgeon General and National Academy of Sciences have published authoritative reports on such relationships. The National Cancer Institute has issued pamphlets recommending food choices to reduce the risk of cancer. The National Heart, Lung, and Blood Institute has issued a range of authoritative publications aimed at reaching the risk of hypertension and heart disease in the United States population.***

The failure of the current system to give adequate weight to the statements of such authoritative bodies, coupled with the prohibitive economic burden that permits only the largest food companies and trade organizations to file a health claim petition to gain approval of a new health claim, has deprived the public of the full disease prevention benefits health claims were intended to provide.

This legislation maintains the rigorous scientific standard health claims must meet under existing law but streamlines the procedure for making health claims when the scientific basis for a claim has been developed by an authoritative scientific body outside FDA. This procedure targets regulatory resources more effectively, and promises to benefit public health substantially more than the current system.

The history of the folic acid and neural tube defects health claim dramatizes the critical need for this legislation. In 1992, the Centers for Disease Control and Prevention (CDC) issued the following recommendation to women of childbearing age, aimed at reducing the risk of pregnancies affected by neural tube defects:

> All women of childbearing age in the United States who are capable of Becoming pregnant should consume 0.4 mg of folic acid per day for the purpose of reducing their risk of having a pregnancy affected with spina bifida or [other neural tube defects].
>
> Centers for Disease Control, 41 Morbidity and Mortality Weekly Report (September 11, 1992).

The CDC estimated that this recommendation could reduce the number of cases of spina bifida and other neural tube defects in the United States by 50 percent.

Despite the significant scientific agreement among qualified experts concerning the evidence supporting the recommendation, manufacturers of foods containing folic acid were prohibited from making claims about the benefits of folic acid in reducing the risk of neural tube defects until FDA approved the claim through a notice and comment rulemaking procedure.

Without appropriately accounting for the CDC recommendations, FDA promulgated a rule in January 1993, prohibiting claims concerning the relationship. In the wake of controversy concerning FDA's action, and despite the absence of any change in the scientific evidence, the Agency reversed course, proposing to authorize such claims in October, 1993. Final regulations authorizing the claim were promulgated in March 1996. Undoubtedly, many children suffered from preventable neural tube defects as a result of FDA delay in authorizing health claims based on the 1992 CDC recommendation.

The amendments this legislation makes to section 403(r)(3) of the Federal Food Drug and Cosmetic Act would prevent a recurrence of the kind of problem presented by the folic acid/neural tube defect claim. While the legislation makes no change to the existing standards governing the health claim approval process, it establishes an alternative procedure by which health claims supported by an authoritative statement of an appropriate scientific body of the U.S. government are authorized. Such claims could be made after premarket notification to FDA, without the delay that accompanies the rulemaking process. The legislation would require manufacturers intending to make such a health claim to submit a premarket notice to FDA concisely describing the claim and the authoritative statement relied upon.

The notice would be submitted at least 120 days before the first introduction of a food bearing the claim into interstate commerce.

Although the legislation would eliminate the requirement for FDA approval of such claims, it would continue to require foods to conform to the "disqualifying nutrient levels" established by FDA under section 403 (r)(3)(A)(ii) and require all health claims to be presented in a truthful, non-misleading manner in conformance with sections 403(a) and 201(n) of the Federal Food Drug and Cosmetic Act. For example, a food bearing a truthful health claim based on an authoritative statement would need to make a material dietary contribution of the substance to which the claim refers to meet the requirements of sections 403(a) and 201(n). The legislation specifically mandates that a health claim accurately represent the authoritative statement on which it is based, and be presented in a manner enabling the public to comprehend the significance of the claim in the context of a total diet.

The agency retains full authority to take enforcement action against a health claim that mischaracterizes the authoritative statement upon which it is based, or that is otherwise misleading. The 120 day premarket notice requirement would enable FDA to identify misleading claims and take action to prevent their use before products bearing such claims are introduced to the market. In response to notifications filed by dietary supplement manufacturers concerning claims made under section 403(r)(6) of the Act, a provision adopted as part of the Dietary Supplement Health and Education Act of 1994, FDA issues "courtesy

letters" promptly alerting manufacturers when claims submitted in their notification present a risk of enforcement action. Such an approach is an efficient and effective means of deterring manufacturers from making violative claims.

Under this legislation, the agency retains the full range of enforcement powers it has possessed historically to remedy misleading claims, including the powers of product seizure, injunction, and criminal penalties. In addition, new section 403(r)(3)(D) assures that FDA retains full authority to regulate health claims based on the statements of authoritative bodies through rulemaking. ***Once FDA regulations governing health claims concerning a particular diet/disease relationship (e.g., calcium and osteoporosis) have become effective, no claim concerning that diet/disease relationship based on the statement of an authoritative scientific body could be made unless it is consistent with the FDA regulation. The legislation specifically provides that FDA may prohibit or modify such health claims through rulemaking. In any such proceeding, the standards and criteria for health claims prescribed in section 403(r)(3) and implementing regulations, including the significant scientific agreement standard, would be fully applicable.***

(Emphasis added).

The House Report makes clear that health claims based on authoritative statements of scientific bodies of the United States with official responsibility for public health protection or research are to be allowed into the market without SSA authorization from the Secretary (and, by delegation, the FDA Commissioner). The Senate Report reinforces that point, explaining that the amended health claim provision was designed to prevent the kind of FDA prohibition and delay attendant to FDA's decade long failure to authorize CDC's folic acid/neural tube defect claim on dietary supplement labels. That delay arose first from FDA's SSA denial of the claim and thereafter from FDA delay in authorizing the claim, during which Congress notes preventable neural tube defect births occurred ("The amendments this legislation makes to section 403(r)(3) of the Federal Food Drug and Cosmetic Act would prevent a recurrence of the kind of problem presented by the folic acid/neural tube defect claim"). **The creation of 21 USC(r)(3)(C) thus "eliminates the requirement for FDA approval of" health claims when based on authoritative statements of scientific bodies of the United States with official responsibility for public health protection or research**. It instead establishes an "alternative procedure" whereby accurate representations of authoritative statements published by other U.S. Government scientific bodies are authorized without need for satisfying FDA's SSA requirement: **"[I]t establishes an alternative procedure by which health claims supported by an authoritative statement of an appropriate scientific body of the U.S. government are authorized. Such claims could be made after premarket notification to FDA, without the delay that accompanies the rulemaking process."**

FDA's "Guidance for Industry: Notification of a Health Claim or Nutrient Content Claim Based on an Authoritative Statement of a Scientific Body (June 1998)" Misinterprets and Violates 21 USC USC 343(r)(3)(C)

In its 1998 Guidance[3], FDA prescribed rules to guide the regulated class in filing notices of intended use of health claims based on authoritative statements of federal scientific bodies. The rules exceed the requirements of 21 USC 343(r)(3)(C) and defeat the purpose of the statute by commanding that SSA be satisfied as a condition precedent to health claim allowance.

Through the 1998 Guidance, FDA issues these specific instructions for the content of notices to the agency based on authoritative statements:

(1) FDA requires that the authoritative statement be published by NAS, NIH, CDC, the Surgeon General, FNS, FSIS, or ARS.

(2) FDA requires that the statement be "currently in effect."

(3) FDA requires that the statement "not include a statement of an employee of the scientific body made in the individual capacity of the employee."

(4) FDA requires that the statement "reflect a consensus within the identified scientific body if published by a subdivision of one of the Federal scientific bodies."

(5) FDA requires that the statement "be based on a deliberative review by the scientific body of the scientific evidence."

(6) FDA requires that the health claim based on the authoritative statement satisfy the SSA standard in 21 USC 343(r)(3)(B)(i).

(7) FDA requires that the health claim not be based on findings FDA characterizes as preliminary results.

(8) FDA requires that the health claim not be based on statements that FDA considers inconclusive research.

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[3] In its 1998 Guidance, FDA deemed the following to be scientific bodies of the United States with official responsibility for public health protection or research directly relate to human nutrition: the National Academy of Sciences (NAS) or any of its subdivisions; the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), the Surgeon General within the Department of Health and Human Services; the Food and Nutrition Service (FNS); the Food Safety and Inspection Service (FSIS); and the Agricultural Research Service within the Department of Agriculture (ARS). Although FDAMA "does not provide for health claims based on authoritative statements for dietary supplements," FDA nevertheless "intends to propose that health claims based on authoritative statements be permitted for dietary supplements."

(9) FDA requires that the health claim not be based on statements intended to guide future research.

(10) FDA requires the notification to include the "exact words used in the claim."

(11) FDA requires the notification to include "a concise description of the basis upon which such person relied for determining that the requirements" for an authoritative statement "have been satisfied."

(12) FDA requires "a copy of the statement referred to . . . upon which such person relied in making the claim."

(13)FDA requires what it considers "a balanced representation of the scientific literature relating to the relationship between a nutrient and a disease or health-related condition to which the claim refers."

(14)FDA requires that the balanced representation of the scientific literature include a "bibliography of the scientific literature on the topic of the claim" and a "brief, balanced account or analysis of how this literature either supports or fails to support the authoritative statement."

(15)FDA requires that the health claim be "stated in a manner so that the claim is an accurate representation of the authoritative statement referred to . . . so that the claim enables the public to comprehend the information provided in the claim and to understand the relative significance of such information in the context of a total daily diet."

(16)FDA requires that the food for which a claim is made not exceed the disqualifying amounts of nutrients that may increase the risk of a disease or health-related condition in the general population.

(17)FDA requires that a claim based on an authoritative statement not be false or misleading in any particular.

Each of the 1998 Guidance requirements in bold in (4) – (9) above are not present in the statute and contradict its plain and intended meaning.

In this submission, the parties submit evidence of compliance with the requirements of 21 USC 343(r)(3)(C) and not with those gratuitously demanded by FDA that contradict the requirements of the statute and exceed its requirements. Consequently, the parties provide all information called for in (1) – (3) and (10) – (17) above. In the aftermath of *Loper Bright*

Enterprises, FDA's demand for information called for in (4) – (9) above is not a permissible construction of the statute.

The Impact of Loper Bright Enterprises on FDA's 1998 Guidance Requiring SSA Preclearance and Satisfaction of Conditions Beyond Those Specified in the Statute

Under *Loper Bright Enterprises v. Raimondo*, 603 U.S. 369, 144 S.Ct. 2244 (2024), FDA is denied the interpretive latitude it had under *Chevron USA v. Natural Res. Def. Council,* 467 U.S. 837 (1984). FDA imposition of the requirements listed in (4) – (9) above exceed those specified in the statute. Its insistence on SSA preclearance directly contradicts the statute. In those respects FDA contradicts the plain and intended meaning of the statute. Consequently, FDA must in this proceeding revoke those requirements and reinterpret the statute to comport with its plain and intended meaning. Doing so requires that it limit its requirements to those listed in (1) – (3) above and to (10) – (17) above and that it drop as a condition precedent to health claim authorization under 21 USC 343(r)(3)(C) its demand for satisfaction of SSA, thereby directly contradicting the statutory language.

In the *Loper Bright Enterprises*, the Supreme Court overruled *Chevron USA v. Natural Res. Def. Council,* 467 U.S. 837 (1984), and with it the doctrine of judicial deference to administrative agency interpretation of statutory law. Under Chevron*,*

> [C]ourts used a two-step framework to interpret statutes administered by federal agencies. After determining that a case satisfies various proconditions . . . for *Chevron* to apply, a reviewing court must first assess "whether Congress has directly spoken to the precise question at issue." *Id.* At 842. If, and only if, congressional intent is "clear," that is the end of the inquiry. *Ibid.* But if the court determines that "the statute is silent or ambiguous with respect to the specific issue" at hand, the court must, at *Chevron's* second step, defer to the agency interpretation if it "is based on a permissible construction of the statute." *Id. At 843.*
>
> 144 S.Ct. at 2254.

In overruling *Chevron*, the Supreme Court explained that under the Administrative Procedure Act, 5 USC 706, "agency interpretations of statutes—like agency interpretations of the Constitution—are *not* entitled to deference." Rather, it "remains the responsibility of the court to decide whether the law means what the agency says." 144 S.Ct. at 2261. The Court now requires "the best reading" of a statute, not merely an agency's plausible reading, reasoning: "It . . . makes no sense to speak of a 'permissible' interpretation," *Id.* at 2268, rather, "[i]n the business of statutory interpretation, if it is not the best, it is not permissible." *Id.* Moreover, it is no longer enough for an agency to proclaim itself expert in an area of regulation as a justification for usurping the role of the Courts in determining the meaning of the law. The "tool kit" the Courts use where the statutory language is silent or ambiguous on a point is one of discerning plain meaning by reference to context guided by the canons of statutory construction. Ambiguities are to be resolved consistent with intended meaning, discernible from the statute as a whole and from the legislative intent expressed in the House and Senate Committee reports, and commentary on the floor of Congress by bill sponsors.

Any Action by FDA to Compel the Health Claims Here in Issue to Undergo SSA Review, or to Deny Them, Necessarily Creates an As-Applied First Amendment Challenge Against FDA's Content-Based and Speaker-Based Order

Under the 1998 Guidance, FDA states its intention to review every proposed health claim noticed pursuant to 21 USC 343(r)(3)(C) under the SSA standard in 21 USC 343(r)(3)(B)(i). In this instance health claims are based on authoritative statements of scientific bodies of the U.S. government with official responsibility for public health protection or research directly relating to human nutrition. In other words, the Government itself is the source of the information represented in the health claims. Those authoritative statements this Government makes directly to the public. The health claims directly represent the very statements made by the Government and do so in context with the precise substances at the precise dose levels identified by the Government as having disease risk reduction effects. Consequently, if FDA either burdens or prohibits any of the health claims here in issue it engages in content-based and speaker-based discrimination, inviting an as-applied challenge. Content-based and speaker-based speech burdens and bans are presumptively unconstitutional under the First Amendment. See, e.g., *Sorrell v. IMS Health Inc.*, 564 U.S. 552, 571 (2011) (citing *R.A.V. v. City of St. Paul*, 505 U.S. 377, 382 (1992). The speech in issue is non-commercial and scientific, indeed substantively the government's own, entitled to strict scrutiny protection. See generally *Miller v. California*, 413 U.S. 15, 34 (1973) (explaining that the "First Amendment protects works" which have "scientific value"); *Roth v. United States*, 354 U.S. 476, 484 (1957) (quoting letter of Continental Congress citing scientific advancement as a reason for protecting freedom of the press). The mere fact that the scientific speech lifted from government publications and placed on the very products identified in those publications enters commerce when on labels and in labeling does not diminish the intrinsic fact that the substance of the statements is non-commercial and scientific and thus entitled to full First Amendment protection. Even so, if the content were assessed under intermediate scrutiny afforded commercial speech, it would still result in the same outcome, an unconstitutional act of suppression because the means chosen do not effectuate the alleged ends of protecting consumers from deception. Indeed, the speech is substantively the very speech the government itself communicates to the public.

In the first instance, FDA cannot logically or reasonably contend that speech vetted by its sister agencies and presented to the public is either inherently or potentially misleading. In the grand scheme of things, FDA is not the ultimate or penultimate truth cipher among scientific bodies of the U.S. government with official responsibility for public health protection or research directly relating to human nutrition, but is, instead, co-equal with its sisters. At best, FDA must contend that the speech somehow is transmogrified when it leaps from an authoritative statement published by a government agency to the label or labeling of a product containing the very ingredients identified as health enhancing by that agency. That idea, once argued by the Department of Justice to the U.S. Court of Appeals in *Pearson v. Shalala*, stretches logic beyond the breaking point and neuters the First Amendment by causing it to have only situational meaning, positions rejected by our Court of Appeals.

In any event, the speech here in issue concerns a precise category disfavored by this agency, speech concerning the association between nutrients and disease (more particularly, concerning the effect of nutrients on reducing the risk of disease). "Government regulation of speech is content based if a law applies to particular speech because of the topic discussed or the idea or message expressed." *Reed v. Town of Gilbert, Ariz.*, 576 U.S. 155, 159 (2015). The regulations here in issue are thus content-based. Moreover, because the FDA acts only against regulatees who wish to communicate health claims based on authoritative statements on the label and in the labeling of food products in the market, the regulations are speaker-based. Laws designed or intended to suppress or restrict the expression of specific speakers because of the content of their expression violate the First Amendment. See *Turner Broadcasting System, Inc. v. FCC*, 512 U.S. 622, 658 (1994) (explaining that strict scrutiny applies to regulations reflecting "aversion" to what "disfavored speakers" have to say); *United States v. Playboy Ent. Grp*., 529 U.S. 803, 812 (2000). As such, FDA's content and speaker-based restrictions cannot survive constitutional muster unless they satisfy the heightened burden of strict scrutiny, which is the government's burden to prove.

Under strict scrutiny, FDA must show that its regulations are narrowly tailored to serve a compelling state interest, such that the means directly further the ends and there are no less speech restrictive alternatives to achieve its ends. *Sorrell v. IMS Health Inc.*, 564 U.S. 552, 566 (2011); *Reed v. Town of Gilbert, Ariz.*, 576 U.S. 155, 163 (2015). Here, the FDA's interest is presumably one of ensuring that health claims based on authoritative statements of government agencies are accurate reflections of those statements and apply to the dietary ingredients in issue. Achievement of that interest does not require SSA satisfaction or FDA review of the "sufficiency" of its sister agencies' evidentiary evaluations and considerations. Yet, here, FDA presumes its subjective desires for more evidence than sufficient to establish the claim truthful, justifies claim suppression rather than allowance of the claim into the market. FDA's means are not narrowly tailored because they do not focus on the accuracy of what is republished by the parties, but in insisting that its own standard of review (SSA or, as it has interpreted it, conclusive proof) is satisfied. Yet truth can be conveyed about even scientifically inconclusive claims, as the United States Court of Appeals for the D.C. Circuit explained to this agency in *Pearson v. Shalala*, 164 F.3d 650 (1999), reh'g den., 172 F.3d 72 (1999).

Consequently, an accurate reflection of an authoritative statement of another federal agency can under the terms of the 1998 Guidance be suppressed by FDA from appearing on labels and labeling if FDA concludes subjectively that for one reason or another the evidence acceptable to its sister is unacceptable to it. Indeed, FDA demands not only SSA satisfaction (proof to a near conclusive degree, a literal impossibility in science) but also proof of a consensus within the identified scientific body; proof of a deliberative review by the scientific body of the scientific evidence; proof that the health claim is not based on findings FDA considers preliminary; proof that the health claim is not based on findings FDA considers inconclusive; or proof that the health claim is not based on statements FDA considers intended to guide future research. As the United States Court of Appeals for the D.C. Circuit made clear in *Pearson v. Shalala*, 164 F.3d 650 (1999), reh'g den., 172 F.3d 72 (1999), FDA has a First Amendment duty to avoid suppressing health claims backed by scientific evidence that harbor only a potential to mislead based solely on its view that supportive science is not enough, even if it deems the evidence supporting the claim inconclusive or preliminary. Its proper resort

under *Pearson* is to allow the claim to be made and state its reservations as to conclusiveness in a reasonable, succinct, unbiased, claim qualification. It must allow the claim into the market relying on the less speech restrictive alternative of claim qualification, if it is to survive constitutional review.

But even were strict scrutiny not applied, and this content- and speaker-based restriction on scientific speech deemed wholly commercial in nature, the regulations would still fail under the applicable test. Under a commercial speech inquiry, FDA bears the burden of justifying its content-based prior restraints as consistent with the First Amendment (*Thompson v. Western States Medical Center*, 535 U.S. 357, 373 (2002)). To sustain its burden, FDA must show that the regulation directly advances a substantial governmental interest and that the measure is drawn to achieve that interest (see *Sorrell v. IMS Health Inc.*, 564 U.S. 552, 571-572 (2011), citing: *State Univ. of New York v. Fox,* 492 U.S. 469, 480-481 (1989), and *Central Hudson Gas & Elec. Corp. v. Public Serv. Comm'n of N.Y.*, 447 U.S. 557, 566 (1980)). There must be a reasonable "fit between" the means chosen and the ends. FDA is required to show that the harms it recites are real and that the means it has chosen will advance its ends to a material degree (*Edenfield v. Fane*, 507 U.S. 761, 762 (1993), quoting: "A governmental body seeking to sustain a restriction on commercial speech must demonstrate that the harms it recites are real and that its restriction will in fact alleviate them to a material degree"). Here, FDA's harms are entirely speculative; there is no basis to presume that the authoritative statements of FDA's sister scientific bodies already published to the public, when published as health claims on the label or in labeling of food, are inherently misleading. Moreover, suppressing that information, appearing as it does in publications of the government itself, is certainly a very indirect way of advancing the FDA's interest, one whose fit between means and ends are not reasonably calculated to achieve the ends of avoiding misleadingness.

Accordingly, even if FDA presumes its 1998 Guidance valid in all respects, or otherwise insists upon the provisions within it that conflict with the statute or impose requirements not specified in the statute, suppression of the health claims presented here will necessarily violate its enabling act and the First Amendment.

THE HEALTH CLAIMS NOTICED FOR AGENCY AUTHORIZATION PURSUANT TO 21 USC 343(r)(3)(C)

In compliance with 21 USC 343(r)(3)(C), ANH, Living Fuel, Health Ranger Store and Sanacor International and Evolution Nutraceuticals dba Cardio Miracle hereby submit the following responsive information requisite to FDA authorization of the foregoing health claims based on authoritative statements published by the National Institutes for Health and the Centers for Disease Control and Prevention.

Based on 21 USC 343(r)(3)(C) and relevant FDA regulations (21 CFR 101.70 and 101.14), the 118 health claims presented in Exhibit 1 are presented for FDA authorization based on corresponding, numbered authoritative statements shown in Exhibit 2. The federal scientific body (e.g., NIH, CDC) that issued each authoritative statement has been identified (Exhibit 2), and each statement and corresponding, numbered, proposed nutrient-disease claim

explicitly describes the relationship between the nutrient or substance and a disease or health-related condition (21 CFR101.14(a)(1)). Each authoritative statement given in Exhibit 2 was found to be published on the specified federal agency website (shown in Exhibit 2) on the date of submission of this petition. The scientific evidence that each agency appears to have relied on to justify each statement has been consolidated in Exhibit 4.

An internal review by the petitioners of the agency's publications revealed that as of the date of this submission the relevant government health agencies had not revoked or otherwise modified or delimited any of the foregoing authoritative statements. Additionally, none appear to have been superseded by newer findings (21 CFR 101.14(c)(2)(iv)). We therefore conclude that they are currently in effect.

The authoritative statements are published by and are presented to the public as statements of the NIH or the CDC, U.S. federal scientific bodies with public health protection or research responsibilities directly relating to human nutrition. These are not statements of employees or other representatives of the government scientific bodies made in their individual capacity.

To determine that the requirements for an authoritative statement have been satisfied, the parties hereto conducted detailed searches of the official websites of agencies under the Department of Health and Human Services, and in particular the NIH and CDC. The largest repositories of information pertaining to nutrient-disease relationships were found on the websites of the Office of Dietary Supplements (ODS) (https://ods.od.nih.gov/factsheets/list-all/) and the National Center for Complementary and Integrative Health (NCCIH) (https://www.nccih.nih.gov/), both being offices of the NIH.

The proposed claims (Exhibit 1) based on corresponding, numbered, authoritative statements (Exhibit 2) have been conscientiously summarized to capture their intended meaning and to ensure they are readily understood by the average U.S. consumer on labels and in labeling. Furthermore, for each authoritative statement, the underlying science referenced by the authority has been reviewed; the relevant dosing information is provided in Exhibit 2, while the supporting scientific evidence—drawn from agency publications cited in Exhibit 2—has been collated in Exhibit 4. Exhibit 3 lists the relevant corporate petitioners that are currently selling dietary supplements or functional foods that contain dietary ingredients that are within the same dose range referenced in the corresponding, numbered authoritative statement.

All proposed health claims (as shown in the header of Exhibit 1) pertain to ingredients present in conventional (including 'functional') foods, medical foods and dietary supplements in amounts that the meet the minimum dose ranges specified in Exhibit 2. 21 USC 342(a)(1) ensures that inclusion amounts must not exceed those that may render a food product injurious to health causing it to be considered adulterated.

The numbered, proposed health claims (Exhibit 1) have been worded to provide an accurate representation of the authoritative statement, with reference to the place of publication of the authoritative statement, and, where relevant, qualification to ensure that the public understands the relative significance of the claim within the context of a total daily diet.

The foods for which these claims are made, namely conventional foods, medical foods, and dietary supplements (see Exhibit 1), does not exceed the disqualifying amounts of nutrients that may increase the risk of a disease or a health-related condition in the general population.

Even if FDA Refuses to Grant FDAMA Claims, It Must Allow the Claims under the First Amendment

The speech here in issue are claims directly based on authoritative statements communicated by federal government health agencies to the public concerning the very dietary ingredients in the very dose amounts offered by the petitioners. The claims mirror the substantive meaning of the authoritative statements. They are akin to lifting the content from the government publications and placing that content on a label and in labeling. This is essentially a republication of the government's own speech.

Under the First Amendment, the government is barred from exercising control over private editorial discretion such that it compels speech or denies the right to communicate the speech because of an aversion to the speaker or to the content. The First Amendment prohibits the government from using censorship to "tilt" public debate "in a preferred direction." *Moodey v. Net Choice LLC,* 603 U.S. 603 U.S. 707 (2024), citing *Sorrell v. IMS Health, Inc.*, 564 U.S. 552, 578-579 (2011). Government may not use prior restraint to deny publication of information the government itself has acquired. See, e.g., *New York Times Co. v. Sullivan,*403 U.S. 713 (1971). The First Amendment's prohibition on prior restraints is all the more serious when the federal government presumes to forbid a private party from publishing the very content the government itself has already made public. There could be no more direct example of speaker and content-based censorship, which reaches the court with a strong presumption against its constitutionality.

In this instance, the government is equitably barred from arguing that its own publication of scientific information concerning nutrient-disease risk relationships is either false or misleading. Moreover, it lacks any legal or factual foundation to argue that the information when substantively condensed to a label claim by the petitioners is somehow transmogrified into falsehood. Rather, once released into the public domain by the agencies themselves the information is fair game for republication whether by the press or by the seller of a product containing the very dietary ingredient concerned in the very quantitative amounts tied to a reduction in disease risk.

For those reasons, FDA lacks constitutional authority to prevent the claims sought here. While it may not approve them, it cannot disallow them, and must make clear that the petitioners who seek to use them are free to do so by command of the First Amendment.

Executive Orders and Executive Memoranda Compel Allowance of the Claims

Action on this petition is warranted in fulfillment of the President's Memorandum, "Directing Repeal of Unlawful Regulations" (April 9, 2025); the President's Executive Order, "Unleashing Prosperity through Deregulation" (January 31, 2025); and the President's

Executive Order, "Establishing the President's Make America Healthy Again Commission" (February 13, 2025).

Under the Memorandum of April 9, the President called on the heads of the executive departments and agencies to determine the lawfulness of the agency's regulations under recent Supreme Court precedent, including *Loper Bright Enterprises* and *West Virginia v. EPA*, 597 U.S. 657 (2022), among others. Those cases relied upon here compel FDA to revisit the regulations here in issue to ensure that its interpretation of its enabling statute and the limitations on its power under the First Amendment are aligned so that health information, such as that sought to reach the public at the point of sale here, is not suppressed.

Under the Executive Order of January 31, the regulatory prior restraints at issue here must be brought down to ensure that health information published by the government is transparently communicated to the public at the point of sale, enabling the public to make better informed food and dietary supplement choices, redounding to the health benefit of consumers and a reduction in the incidence of chronic disease and dependency on public resources for health care.

Under the Executive Order of February 13, the President established the MAHA Commission with one particular objective being the establishment of "transparency," allowing vital health information to reach the public, including the aim of ensuring that "all federally funded health research should empower Americans through transparency and open-source data, and should avoid or eliminate conflicts of interest that skew outcomes and perpetuate distrust."

This petition advances that presidential memorandum and those presidential orders by ending FDA prior restraint that deprives the public at the point of sale of truthful, non-misleading nutrient-disease risk reduction information indispensable to better health outcomes.

Conclusion

For the foregoing reasons, ANH and Living Fuel International, Inc., Health Ranger Store, Inc., and Sanacor International, Inc. and Evolution Nutraceuticals, Inc. dba Cardio Miracle, by counsel, respectfully request that FDA authorize each of 118 nutrient-disease health claims presented herein or allow each claim to be made on the respective label and in the respective labeling of the foods or dietary supplements identified herein by the company sponsors listed herein.

Respectfully submitted,
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EXHIBIT 1

Numbered, proposed nutrient/disease claims

Health Claim No	Substance(s)	Proposed Claims (applicable to adults, unless otherwise stated). Relevant foods: conventional/functional foods, dietary supplements, and medical foods. For minimum dosages see Exhibit 2.
1	Vitamin A and Carotenoids	Vitamin A reduces the risk of respiratory diseases/pneumonia.
2	Vitamin A and Carotenoids	Vitamin A may reduce the risk of premature death.
3	Vitamin A and Carotenoids	Natural vitamin A and /or carotenoids in food form may reduce the risk of certain cancers.
4	Vitamin A and Carotenoids	Dietary supplements containing carotenoids, including beta-carotene, or lutein and zeaxanthin, combined with vitamins C and E, zinc and copper, may reduce the rate of vision loss in people with age-related macular degeneration (AMD).
5	Vitamin A and Carotenoids	Vitamin A may reduce the risk of infections, such as measles and diarrhea.
6	Vitamin A and Carotenoids	Vitamin A may reduce the risk of anemia.
7	Vitamin A and Carotenoids	Vitamin A may reduce the risk of xeropthalmia.
8	Boron	Boron may reduce inflammation in the body.
9	Boron	Boron may reduce the risk of osteoarthritis.
10	Boron	Boron may reduce the risk of certain cancers.
11	Boron	Boron may increase bone strength.
12	Vitamin B1/Thiamin	Thiamin may reduce the risk of memory loss, muscle weakness and heart problems.

13	Vitamin B2/Riboflavin	Riboflavin may reduce the risk of migraine headaches.
14	Vitamin B2/Riboflavin	Riboflavin may reduce the risk of skin disorders, […], cataracts, sores at the corners of the mouth, sore throat, liver disorders, and reproductive and nervous system disorders.
15	Vitamin B2/Riboflavin	Riboflavin may reduce the risk of anemia.
16	Niacin	Nicotinic acid (at doses of 1600 mg or more daily) may lower LDL ('bad') cholesterol and triglycerides, and raise HDL ('good') cholesterol.
17	Vitamin B12/Cobalamin	Vitamin B12, vitamin B6 and folate may reduce the risk of heart attack or stroke in people with sub-normal blood levels of homocysteine.
18	Vitamin B12/Cobalamin	Vitamin B12 may reduce the risk of megaloblastic anemia.
19	Vitamin B12/Cobalamin	Vitamin B12 may reduce the risk of pernicious anemia.
20	Vitamin B12/Cobalamin	Vitamin B12 may reduce the risk of certain neurological problems.
21	Chromium	Chromium may reduce the risk of impaired glucose tolerance.
22	Chromium	Chromium may reduce the risk of type 2 diabetes.
23	Chromium	Chromium may reduce the risk of insulin resistance.
24	Chromium	Chromium may reduce the risk of metabolic syndrome.
25	Vitamin B6	Folate (500-5000 mcg DFE/d), vitamin B12 (1000-5000 mcg DFE/d) and vitamin B6 (20-25 mg DFE/d) may lower the risk of cardiovascular disease.
26	Vitamin B6	Vitamin B6 may reduce the risk of abnormal brain development in the fetuses of pregnant women.

27	Vitamin B6	Vitamin B6 supplementation may reduce the risk of vitamin B6 deficiency, the symptoms of which include: anemia, itchy rashes, scaly skin on the lips, cracks at the corners of the mouth, swollen tongue, depression, confusion, or a weak immune system. In infants, vitamin B6 deficiency may include irritability, extreme sensitivity in hearing, or seizures.
28	Vitamin B9/Folate	Food forms of folate may decrease the risk of several forms of cancer. Folic acid (pteroylmonoglutamic acid) taken at the recommended amounts (400 mcg DFE/day for children of 14 years and older and adults, except pregnant women, who should take 600 mcg DFE/day and lactating women, who should take 500 mcg DFE/day) may help reduce the risk of certain forms of cancer.
29	Vitamin B9/Folate	Folate supplements in the methylated form (5-methyltetrahydrofolate, or 5-MTHF) may reduce the risk of depression.
30	Vitamin B9/Folate	Vitamin B12 and folate supplementation may reduce the risk of megaloblastic anemia.
31	Vitamin B9/Folate	Adequate folate intake (600 mcg DFE/day) before conception and in the earliest days and weeks of pregnancy may reduce the risk of abnormal fetal brain and spine development.
32	Calcium	Calcium supplements may reduce the risk of preeclampsia in pregnant women who consume too little calcium in their normal diet.
33	Calcium	For those with low calcium status, increasing calcium intake may reduce the risk of metabolic syndrome.
34	Calcium	Normalizing calcium status may reduce the risk of osteomalacia.
35	Choline	Choline may reduce the risk of non-alcoholic fatty liver disease/metabolic dysfunction–associated steatotic liver disease (NAFLD/MASLD)
36	Copper	If your copper status is low, copper supplementation may reduce the risk of skin discoloration patches (*pityriasis alba*).
37	Copper	If your copper status is low, copper supplementation may reduce the risk of high blood cholesterol.
38	Copper	If your copper status is low, copper supplementation may reduce the risk of loss of balance and coordination.

39	Copper	If your copper status is low, copper supplementation may reduce your risk of infection.
40	Copper	If your copper status is low, copper supplementation may reduce your risk of connective tissue disorders affecting the ligaments and skin.
41	Copper	If your copper status is low, copper supplementation may reduce your risk of weak and brittle bones.
42	Vitamin C	Vitamin C helps the body make collagen needed for wound healing.
43	Vitamin C	Vitamin C helps support the proper function of the immune system needed to protect the body from infections.
44	Vitamin C	Vitamin C, in combination with vitamin E, lutein, zeaxanthin, zinc, copper, may help reduce the risk of age-related macular degeneration (AMD).
45	Vitamin D	Vitamin D reduces the risk of rickets in children.
46	Vitamin D	Vitamin D reduces the risk of osteomalacia (in adults).
47	Vitamin D	Vitamin D may reduce the risk of weak, painful muscles.
48	Vitamin D	Vitamin D may reduce the risk of loss of balance and falls in the elderly.
49	Vitamin D	Vitamin D supplementation may reduce the risk of infection by pathogenic bacteria and viruses.
50	Vitamin D	Vitamin D may reduce the risk of high blood pressure (hypertension).
51	Vitamin D	Vitamin D may reduce the risk of high blood cholesterol levels.
52	Vitamin D	Vitamin D may reduce the risk of developing multiple sclerosis (MS).

53	Vitamin E	Vitamin E may reduce the risk of infections.
54	Vitamin E	Vitamin E reduces the risk of cell adhesion and platelet aggregation, thereby reducing the risk of atherosclerosis.
55	Vitamin E	Vitamin E can prevent loss of body control, muscle weakness and numbness in the arms and legs, and vision problems caused by vitamin E deficiency.
56	Iodine	Adequate iodine during pregnancy reduces the risk of abnormal bone and brain development in fetuses.
57	Iodine	Iodine intake by pregnant women reduces the risk of stunted growth, intellectual disabilities and delayed sexual development of fetuses.
58	Iodine	Iodine intake in mildly iodine deficient children may reduce the risk of reasoning disabilities and abnormal cognitive function.
59	Iron	Iron intake during pregnancy may reduce the risk of abnormal fetal growth and development.
60	Iron	Iron intake by pregnant women may reduce the risk of low fetal birth weight or premature fetal birth.
61	Vitamin K	Vitamin K1 supplementation reduces the risk of excessive bruising or bleeding
62	Vitamin K	Vitamin K2 may reduce the risk of osteoporosis.
63	Magnesium	Magnesium may help reduce the risk of type 2 diabetes.
64	Magnesium	Magnesium may help reduce the risk of insulin resistance.
65	Magnesium	Magnesium may reduce the risk of bone fractures.
66	Magnesium	Magnesium may reduce the risk of osteoporosis.

67	Magnesium	Magnesium may reduce the risk of bone mineral density loss in post-menopausal women.
68	Magnesium	Magnesium may reduce the risk of migraine headaches.
69	Magnesium	Magnesium may help reduce the risk of heart arrythmia.
70	Magnesium	Magnesium may reduce the risk of cardiovascular disease.
71	Manganese	Manganese may reduce the risk of osteoporosis.
72	Manganese	Manganese may reduce the risk of blood clots.
73	Molybdenum	Molybdenum may reduce the risk of toxicity posed by drugs and toxic substances in the body.
74	Multivitamin/mineral Supplements	The combination of vitamin C (500 mg/day), Vitamin E (400 IU/day), zinc (80 mg/day), Copper (2 mg a day), lutein (10 mg/day) and zeaxanthin (2 mg/day) may reduce the risk of age-related macular degeneration (AMD).
75	Potassium	Potassium may reduce the risk of high blood pressure (hypertension), coronary heart disease and stroke.
76	Potassium	Increasing the daily intake of potassium while keeping sodium intake within the range of 4 to 6 grams daily may reduce the risk of hypertension and stroke.
77	Potassium	Potassium supplementation may reduce the risk of kidney stones.
78	Potassium	Potassium supplementation may reduce the risk of osteoporosis.
79	Zinc	Zinc may reduce the risk of pathogenic bacteria and viruses.
80	Zinc	Zinc may reduce the length of wound healing.

81	Zinc	Zinc may reduce the duration of the common cold.
82	Zinc	Zinc may reduce the risk of pneumonia.
83	Zinc	Zinc may reduce the risk of type 2 diabetes.
84	Zinc	Zinc may reduce the risk of hypercholesterolemia.
85	Zinc	Zinc may reduce the frequency of infections.
86	Vitamin B5/Pantothenic acid	Pantothenic acid may reduce the risk of hyperlipidemia (abnormally high levels of lipids [fats] such as cholesterol or triglycerides in the blood).
87	Selenium	Selenium may reduce the risk of oxidative damage from infections.
88	Selenium	Selenium may reduce the risk of hypothyroidism (low thyroid activity).
89	Selenium	Selenium may reduce the risk of cognitive decline.
90	Selenium	Selenium may reduce the risk of Keshan Disease.
91	Selenium	Selenium may reduce the risk of cardiovascular disease by reducing inflammation, platelet aggregation, and lipid oxidation.
92	Asian ginseng (*Panax ginseng*)	Asian ginseng may help reduce the risk of excessive blood cholesterol levels.
93	Asian ginseng (*Panax ginseng*)	Asian ginseng may reduce the risk of chronic inflammation in the body.
94	Asian ginseng (*Panax ginseng*)	Asian ginseng may reduce the risk of erectile dysfunction (ED).

95	Ashwagandha (*Withania somnifera*)	Ashwagandha may reduce insomnia.
96	Astragalus (*Astragalus membranaceus)*	Astragalus may reduce the risk of lower respiratory infections.
97	Bromelain (from pineapple. *Ananas comosus*)	Preliminary research suggests that bromelain may reduce the risk of sinus congestion.
98	Chamomile (*Matricaria recutita, Chamomilla recutita*)	Chamomile may reduce the risk of mild depression.
99	Chamomile (*Matricaria recutita, Chamomilla recutita*)	Chamomile may reduce the risk of diarrhea in children and colic in infants.
100	Cranberry (*Vaccinium macrocarpon*)	Cranberry extracts may reduce the risk of repeat urinary tract infections (UTIs) in women.
101	Elderberry (*Sambucus nigra*)	Elderberry may reduce the risk of colds, flu, and other upper respiratory infections.
102	Flaxseed (*Linum usitatissimum*)	Flaxseed oil supplements containing alpha-linolenic acid (ALA) may help reduce the risk of insulin resistance.
103	Garlic (*Allium sativum*)	Garlic supplements may reduce total and LDL ('bad') cholesterol in people with high cholesterol levels.
104	Ginger (*Zingiber officinale*)	Ginger may reduce the risk of nausea and vomiting associated with pregnancy.
105	Ginkgo (*Ginkgo biloba*)	Ginkgo Biloba may help reduce the risk of dementia.
106	Grape (*Vitis* spp.)	Grape seed and skin-derived antioxidants may reduce the risk of heart disease.
107	Grape (*Vitis* spp.)	Proanthocyanidin-rich grape seed extracts may reduce the risk of chronic venous insufficiency (CVI).
108	Green Coffee (*Coffea* spp.) Bean	Green coffee bean extracts may lower blood sugar levels.
109	Green Tea (*Camellia sinensis*)	Green tea may lower total and LDL ('bad') cholesterol.

110	Lavender (*Lavandula angustifolia*)	Lavender (*Lavandula angustifolia*) oil taken orally may reduce sexual dysfunction in menopausal and post-menopausal women.
111	Peppermint (*Mentha × piperita*)	Peppermint (*Mentha × piperita*) leaves (or oil) may help reduce the risk of irritable bowel syndrome (IBS).
112	Turmeric (*Curcuma longa*)	Turmeric (*Curcuma longa*) extracts may reduce the risk of osteoarthritis.
113	Omega-3 fatty acids	Omega-3 fatty acids rich in EPA and DHA may reduce inflammation.
114	Omega-3 fatty acids	Omega-3 fatty acids may reduce the risk of certain cancers.
115	Fiber	Fiber may help lower blood glucose and insulin levels after eating carbohydrates.
116	Fiber	Fiber may lower fasting blood glucose levels.
117	Fiber	Fiber may reduce the risk of high blood pressure (hypertension)
118	Fiber	Fiber may reduce the risk of chronic constipation.

EXHIBIT 2

Authoritative statements, authority, references, and quantitative amounts pertaining to each numbered proposed claim (as specified in Exhibit 1)

Health Claim No	Substance(s)	Authoritative statements	Authority/ Agency	Reference (URL)	Minimum Dosage (derived from science supporting relevant authoritative statement)
1	Vitamin A and Carotenoids	[1] A long-term deficiency of vitamin A can also lead to a higher risk of respiratory diseases (such as pneumonia).	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/VitaminA-Consumer/ [1] https://ods.od.nih.gov/factsheets/VitaminA-HealthProfessional/ [2]	**4–8 years:** 400 mcg **9–13 years:** 600 mcg **14–18 years:** 900 mcg (M) 700 mcg (F) 750 mcg (Pregnancy) 1,200 mcg (Lactation) **19–50 years:** 900 mcg (M) 700 mcg (F) 770 mcg (Pregnancy) 1,300 mcg (Lactation) **51+ years:** 900 mcg (M) 700 mcg (F)
2	Vitamin A and Carotenoids	[1] In severe cases, not getting enough vitamin A can increase your chances of dying.			
3	Vitamin A and Carotenoids	[1] People who eat a lot of foods containing vitamin A or beta-carotene might have a lower risk of certain kinds of cancer.			
4	Vitamin A and Carotenoids	[1] Age-related macular degeneration (AMD) is the loss of central vision as people age. It's the most common cause of vision loss in older people. Studies show that a supplement containing vitamins C and E, zinc, and copper with or without beta-carotene helps slow down the rate of vision loss in people with AMD who are at high risk of developing advanced AMD. The same supplement, containing lutein and zeaxanthin instead of beta-carotene, reduces the risk of progression to advanced AMD even more			
5	Vitamin A and Carotenoids	[1] A long-term deficiency of vitamin A can also lead to a higher risk of […] infections (such as measles and diarrhea).			
6	Vitamin A and Carotenoids	[1] A long-term deficiency of vitamin A […] can also cause anemia (a condition in which the red blood cells do not supply enough oxygen to the body).			

7	Vitamin A and Carotenoids	[2] The most common clinical sign of vitamin A deficiency is xerophthalmia, which develops after plasma retinol has been low and the eye's vitamin A reserves have become depleted.	Centers for Disease Control and Prevention (CDC)		
8-9	Boron	[2] Observational evidence combined with the findings from a few small clinical studies in humans suggests that boron might be helpful for reducing the symptoms of osteoarthritis, possibly by inhibiting inflammation.	National Institutes of Health	https://ods.od.nih.gov/factsheets/Boron-Consumer/ [1] https://ods.od.nih.gov/factsheets/Boron-HealthProfessional/ [2]	**4–8 years:** 6 mg **9–13 years:** 11 mg **14–18 years:** 17 mg 17 mg (Pregnancy + Lactation) **19+ years:** 20 mg 20 mg (Pregnancy + Lactation)
10	Boron	[2] Preliminary evidence suggests that dietary boron intake might affect cancer risk.	National Institutes of Health		
11	Boron	[2] Boron might be important for bone growth and formation, possibly by affecting osteoblast and/or osteoclast activity or by influencing serum steroid hormone levels and calcium metabolism.	National Institutes of Health		
12	Vitamin B1/Thiamin	[2] In its early stage, thiamin deficiency can cause weight loss and anorexia, confusion, short-term memory loss, and other mental signs and symptoms; muscle weakness; and cardiovascular symptoms (such as an enlarged heart).	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Thiamin-Consumer/ [1] https://ods.od.nih.gov/factsheets/Thiamin-HealthProfessional/ [2]	**4–8 years:** 0.6 mg **9–13 years:** 0.9 mg **14–18 years:** 1.2 mg 1.0 mg 1.4 mg (Pregnancy + Lactation) **19–50 years:** 1.2 mg (M) 1.1 mg (F) 1.4 mg (Pregnancy + Lactation)

					51+ years: 1.2 mg (M) 1.1 mg (F)
13	Vitamin B2/Riboflavin	[2] Some, but not all, of the few small studies conducted to date have found evidence of a beneficial effect of riboflavin supplements on migraine headaches in adults and children.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Riboflavin-Consumer/ [1] https://ods.od.nih.gov/factsheets/Riboflavin-HealthProfessional/ [2]	**4–8 years:** 0.6 mg **9–13 years:** 0.9 mg **14–18 years:** 1.3 mg (M) 1.0 mg (F) **19+ years:** 1.3 mg (M) 1.1 mg (F) 1.4 mg (Pregnancy) 1.6 mg (Lactation)
14	Vitamin B2/Riboflavin	[2] The signs and symptoms of riboflavin deficiency (also known as ariboflavinosis) include skin disorders, hyperemia (excess blood) and edema of the mouth and throat, angular stomatitis (lesions at the corners of the mouth), cheilosis (swollen, cracked lips), hair loss, reproductive problems, sore throat, itchy and red eyes, and degeneration of the liver and nervous system.			
15	Vitamin B2/Riboflavin	[1] Severe, long-term riboflavin deficiency causes a shortage of red blood cells (anemia).			
16	Niacin	[1] Scientists have studied the use of large doses of niacin in the form of nicotinic acid to help reduce the risk of heart attack and stroke in people with atherosclerosis. They found that prescription-strength nicotinic acid (more than 100 times the recommended dietary allowance) can lower blood levels of LDL (bad) cholesterol, raise levels of HDL (good) cholesterol, and lower levels of triglycerides.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Niacin-Consumer [1] https://ods.od.nih.gov/factsheets/Niacin-HealthProfessional/ [2]	1600 mg or more
17	Vitamin B12/Cobalamin	[1]1 Vitamin B12 supplements (along with other B vitamins) reduce blood levels of homocysteine, a compound linked to an increased risk of having a heart attack or stroke.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/VitaminB12-Consumer/ [1] https://ods.od.nih.gov/factsheets/VitaminB12-HealthProfessional/ [2]	**4–8 years:** 1.2 mcg **9–13 years:** 1.8 mcg **14–18 years:** 2.4 mcg
18	Vitamin B12/Cobalamin	[1] Vitamin B12 also helps prevent megaloblastic anemia, a blood condition that makes people tired and weak.			

19	Vitamin B12/Cobalamin	[1] People with pernicious anemia do not make the intrinsic factor needed to absorb vitamin B12. As a result, they have trouble absorbing vitamin B12 from foods and dietary supplements. Doctors usually treat pernicious anemia with vitamin B12 shots, although very high doses of vitamin B12 given by mouth might also be effective.			2.6 mcg (Pregnancy) 2.8 mcg (Lactation) **19+ years:** 2.4 mcg 2.6 mcg (Pregnancy) 2.8 mcg (Lactation)
20	Vitamin B12/Cobalamin	[2] Vitamin B12 deficiency can cause a number of symptoms, including […] neurological changes.			
21	Chromium	[2] Impaired glucose tolerance and diabetes Because chromium might potentiate the action of insulin, studies have examined whether increasing chromium intakes might reduce the risk of impaired glucose tolerance.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/chromium-Consumer/ [1] https://ods.od.nih.gov/factsheets/Chromium-HealthProfessional/ [2]	**4–8 years:** 15 mcg **9–13 years:** 25 mcg (M) 21 mcg (F) **14–18 years:** 35 mcg (M) 24 mcg (F) 29 mcg (Pregnancy) 44 mcg (Lactation) **19–50 years:** 35 mcg (M) 25 mcg (F) 30 mcg (Pregnancy) 45 mcg (Lactation) **51+ years:** 30 mcg (M) 20 mcg (F)
22-23	Chromium	[2] One small study suggests that chromium picolinate may reduce the risk of **insulin resistance**, and therefore possibly may reduce the risk of **type 2 diabetes**.			
24	Chromium	[2] Metabolic syndrome is a group of risk factors—abdominal obesity, high triglyceride level, low high-density lipoprotein (HDL; good) cholesterol level, hypertension, and high fasting blood glucose level—that raise the risk of heart disease, diabetes, and stroke. Insulin resistance is an integral component of this condition and is a potential therapeutic target for dietary interventions for metabolic syndrome.			
25	Vitamin B6	[1] […] certain B vitamins (such as folic acid, vitamin B12, and vitamin B6) might reduce cardiovascular disease risk by lowering levels of homocysteine, an amino acid in the blood.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/VitaminB6-Consumer/ [1] https://ods.od.nih.gov/factsheets/VitaminB6-HealthProfessional/ [2]	20-25 mg DFE/d

26	Vitamin B6	[1] Vitamin B6 is also involved in brain development during pregnancy and infancy.		https://ods.od.nih.gov/factsheets/VitaminB6-Consumer/ [1] https://ods.od.nih.gov/factsheets/VitaminB6-HealthProfessional/ [2]	**4–8 years:** 0.6 mg **9–13 years:** 1.0 mg **14–18 years:** 1.3 mg (M) 1.2 mg (F) 1.9 mg (Pregnancy) 2.0 mg (Lactation) **19–50 years:** 1.3 mg 1.9 mg (Pregnancy) 2.0 mg (Lactation) **51+ years:** 1.7 mg (M) 1.5 mg (F)
27	Vitamin B6	[1] People who don't get enough vitamin B6 can have a range of symptoms, including anemia, itchy rashes, scaly skin on the lips, cracks at the corners of the mouth, and a swollen tongue. Other symptoms of very low vitamin B6 levels include depression, confusion, and a weak immune system. Infants who do not get enough vitamin B6 can become irritable or develop extremely sensitive hearing or seizures.			
28	Vitamin B9/Folate	[1] Folate that is naturally present in food may decrease the risk of several forms of cancer, but folate supplements might have different effects on cancer risk depending on how much the person takes and when.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Folate-Consumer/ [1] https://ods.od.nih.gov/factsheets/Folate-HealthProfessional/ [2]	**4–8 years:** 200 mcg **9–13 years:** 300 mcg **14–18 years:** 400 mcg 600 mcg (Pregnancy) 500 mcg (Lactation) **19+ years:** 400 mcg 600 mcg (Pregnancy) 500 mcg (Lactation)
29	Vitamin B9/Folate	[1] People with low blood levels of folate might be more likely to have depression. In addition, they might not respond as well to antidepressant treatment as people with normal folate levels. Folate supplements, particularly those that contain 5-MTHF, might make antidepressant medications more effective.			
30	Vitamin B9/Folate	Getting too little folate can result in megaloblastic anemia, a blood disorder that causes weakness, fatigue, trouble concentrating, irritability, headache, heart palpitations, and shortness of breath.			
31	Vitamin B9/Folate	[1] Folate is essential in the earliest days of fetal growth for healthy development of the brain and spine. Folic acid is another form of vitamin B9. Women of reproductive age need 400 micrograms of folic acid every day.	Centers for Disease Control and Prevention (CDC)	https://www.cdc.gov/nutrition/features/micronutrient-facts.html [1]	

32	Calcium	[1] Preeclampsia is a serious complication of late pregnancy. Symptoms include high blood pressure and high levels of protein in the urine. Calcium supplements might reduce the risk of preeclampsia in some pregnant women who consume too little calcium. Therefore, many experts recommend calcium supplements during pregnancy for women with low calcium intakes.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Calcium-Consumer/ [1] https://ods.od.nih.gov/factsheets/Calcium-HealthProfessional/ [2]	**4–8 years:** 1,000 mg **9–13 years:** 1,300 mg **14–18 years:** 1,300 mg 1,300 mg (Pregnancy + Lactation) **19–50 years:** 1,000 mg 1,000 mg (Pregnancy + Lactation) **51–70 years:** 1,000 mg (M) 1,200 mg (F) **>70 years:** 1,200 mg
33	Calcium	[1] Some research suggests that a higher intake of calcium might help lower the risk of metabolic syndrome in women but not men.	Department of Health & Human Services (DHHS)		
34	Calcium	[1] Getting too little calcium can cause several conditions, including the following: Osteoporosis, which causes weak, fragile bones and increases the risk of falls and fractures (broken bones) Rickets, a disease in children that causes soft, weak bones Osteomalacia, which causes soft bones in children and adults	Department of Health & Human Services (DHHS)		
35	Choline	Getting enough choline is necessary for proper liver function and to prevent NAFLD. However, more research is needed to better understand how choline might help prevent or treat NAFLD. [1] However, if a person's choline levels drop too low, he or she can experience muscle and liver damage as well as deposits of fat in the liver (a condition called nonalcoholic fatty liver disease [NAFLD] that can damage the liver). [2]	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Choline-Consumer/ [1] https://ods.od.nih.gov/factsheets/Choline-HealthProfessional/ [2]	550 mg
36-41	Copper	[1] Copper deficiency can cause extreme tiredness, lightened patches of skin, high levels of cholesterol in the blood, and connective tissue disorders affecting the ligaments and skin. Other effects of copper deficiency	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Copper-Consumer/ [1] https://ods.od.nih.gov/factsheets/Copper-HealthProfessional/ [2]	**4–8 years:** 440 mcg **9–13 years:**

		are weak and brittle bones, loss of balance and coordination, and increased risk of infection.			700 mcg **14–18 years:** 890 mcg (M) 890 mcg (F) 1,000 mcg (Pregnancy) 1,300 mcg (Lactation) **19+ years:** 900 mcg 1,000 mcg (Pregnancy) 1,300 mcg (Lactation)
42-43	Vitamin C	[1] The body also needs vitamin C to make collagen, a protein required to help wounds heal. In addition, vitamin C improves the absorption of iron from plant-based foods and helps the immune system work properly to protect the body from disease.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/VitaminC-Consumer/ [1] https://ods.od.nih.gov/factsheets/VitaminC-HealthProfessional/ [2]	**4–8 years:** 25 mg **9–13 years:** 45 mg **14–18 years:** 75 mg (M) 65 mg (F) 80 mg (Pregnancy) 115 mg (Lactation) **19+ years:** 90 mg (M) 75 mg (F) 85 mg (Pregnancy) 120 mg (Lactation)
44	Vitamin C	[1]…research suggests that vitamin C combined with other nutrients might help slow AMD progression.	Department of Health & Human Services (DHHS)		500 mg

45	Vitamin D	[1] In children, vitamin D deficiency causes rickets, a disease in which the bones become soft, weak, deformed, and painful. [2] Vitamin D sufficiency prevents rickets in children.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/VitaminD-Consumer/ [1] https://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/ [2]	**4–8 years:** 15 mcg (600 IU) **9–13 years:** 15 mcg (600 IU) **14–18 years:** 15 mcg (600 IU) **19–50 years:** 15 mcg **51–70 years:** 15 mcg (600 IU) **>70 years:** 20 mcg (800 IU)
46	Vitamin D	[1] In teens and adults, vitamin D deficiency causes osteomalacia, a disorder that causes bone pain and muscle weakness.	Department of Health & Human Services (DHHS)		
47-48	Vitamin D	[1] Your muscles need [vitamin D] to move, and your nerves need it to carry messages between your brain and your body… Muscles are also important for healthy bones because they help maintain balance and prevent falls. A shortage of vitamin D may lead to weak, painful muscles. [2] Bone health also depends on support from the surrounding muscles to assist with balance and postural sway and thereby reduce the risk of falling. Vitamin D is also needed for the normal development and growth of muscle fibers. In addition, inadequate vitamin D levels can adversely affect muscle strength and lead to muscle weakness and pain (myopathy).	Department of Health & Human Services (DHHS)		
49a	Vitamin D	[1] Your immune system needs vitamin D to fight off invading bacteria and viruses.	Department of Health & Human Services (DHHS)		
49b	Vitamin D	[1] Vitamin D helps the immune system resist bacteria and viruses.	Centers for Disease Control and Prevention (CDC)	https://www.cdc.gov/nutrition/features/micronutrient-facts.html	
50-51	Vitamin D	[1] Vitamin D is important for a healthy heart and blood vessels and for normal blood pressure… Some studies show that vitamin D supplements might help reduce blood cholesterol levels and high blood pressure—two of the main risk factors for heart disease.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/VitaminD-Consumer/ [1] https://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/ [2]	

52	Vitamin D	[1] Many studies find a link between low blood vitamin D levels and the risk of developing MS. However, scientists have not actually studied whether vitamin D supplements can prevent MS.	Department of Health & Human Services (DHHS)		
53	Vitamin E	[1] The body also needs vitamin E to boost its immune system so that it can fight off invading bacteria and viruses. [2] Because the digestive tract requires fat to absorb vitamin E, people with fat-malabsorption disorders are more likely to become deficient than people without such disorders. Deficiency symptoms include… impairment of the immune response.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/VitaminE-Consumer/ [1] https://ods.od.nih.gov/factsheets/VitaminE-HealthProfessional/ [2]	**4–8 years:** 7 mg **9–13 years:** 11 mg **14+ years:** 15 mg (M+F+Pregnancy) 19 mg (Lactation)
54	Vitamin E	[Vitamin E] helps to widen blood vessels and keep blood from clotting within them.	Department of Health & Human Services (DHHS)		
55	Vitamin E	[1] Vitamin E deficiency can cause nerve and muscle damage that results in loss of feeling in the arms and legs, loss of body movement control, muscle weakness, and vision problems. Another sign of deficiency is a weakened immune system.	Department of Health & Human Services (DHHS)		
56	Iodine	[1] The body needs iodine to make thyroid hormones. These hormones control the body's metabolism and many other important functions. The body also needs thyroid hormones for proper bone and brain development during pregnancy and infancy… In pregnant women, severe iodine deficiency can permanently harm the fetus by causing stunted growth, intellectual disability, and delayed sexual development. [2] Iodine sufficiency during pregnancy is extremely important for proper fetal development. During early pregnancy, when fetal thyroid gland development is incomplete, the fetus depends entirely on maternal T4 and, therefore, on maternal iodine intake. Production of T4 increases by approximately 50% during pregnancy, requiring a concomitant increase in maternal iodine intake. Sufficient iodine intake after birth is also	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Iodine-Consumer/ [1] https://ods.od.nih.gov/factsheets/Iodine-HealthProfessional/ [2]	**4–8 years:** 90 mcg **9–13 years:** 120 mcg **14–18 years:** 150 mcg 220 mcg (Pregnancy) 290 mcg (Lactation) **19+ years:** 150 mcg

		important for proper physical and neurological growth and maturation.			220 mcg (Pregnancy) 290 mcg (Lactation)
57	Iodine	[1] In pregnant women, severe iodine deficiency can permanently harm the fetus by causing stunted growth, intellectual disability, and delayed sexual development. Less severe iodine deficiency can cause lower-than-average IQ in infants and children and decrease adults' ability to work and think clearly. Goiter, an enlarged thyroid gland, is often the first visible sign of iodine deficiency.	Department of Health & Human Services (DHHS)		
58	Iodine	[1] The effects of mild iodine deficiency during childhood are more difficult to measure, but mild iodine deficiency might cause subtle problems with neurological development… Giving iodine supplements to children with mild iodine deficiency improves their reasoning abilities and overall cognitive function. In children living in iodine-deficient areas, iodine supplements seem to improve both physical and mental development.	Department of Health & Human Services (DHHS)		
59+60	Iron	[1] Iron is a mineral that the body needs for growth and development. [2] Iron is also necessary for physical growth, neurological development, cellular functioning, and synthesis of some hormones. [1] During pregnancy, the amount of blood in a woman's body increases, so she needs more iron for herself and her growing baby. Getting too little iron during pregnancy increases a woman's risk of iron deficiency anemia and her infant's risk of low birth weight, premature birth, and low levels of iron.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Iron-Consumer/ [1] https://ods.od.nih.gov/factsheets/Iron-HealthProfessional/ [2]	**4–8 years:** 10 mg **9–13 years:** 8 mg **14–18 years:** 11 mg (M) 15 mg (F) 27 mg (Pregnancy) 10 mg (Lactation) **19–50 years:** 8 mg (M) 18 mg (F) 27 mg (Pregnancy)

					9 mg (Lactation) **51+ years:** 8 mg
61	Vitamin K	[1] Severe vitamin K deficiency can cause bruising and bleeding problems because the blood will take longer to clot.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/VitaminK-Consumer/ [1] https://ods.od.nih.gov/factsheets/vitaminK-HealthProfessional/ [2]	**4–8 years:** 55 mcg **9–13 years:** 60 mcg **14–18 years:** 75 mcg **19+ years:** 120 mcg (M) 90 mcg (F)
62	Vitamin K	[1] Vitamin K deficiency might reduce bone strength and increase the risk of getting osteoporosis because the body needs vitamin K for healthy bones.			
63	Magnesium	[1] People with higher amounts of magnesium in their diets tend to have a lower risk of developing type 2 diabetes. Magnesium helps the body break down sugars and might help reduce the risk of insulin resistance (a condition that leads to diabetes).	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Magnesium-Consumer/ [1] https://ods.od.nih.gov/factsheets/Magnesium-HealthProfessional / [2]	**4–8 years:** 130 mg **9–13 years:** 240 mg **14–18 years:** 410 mg (M) 360 mg (F) 400 mg (Pregnancy) 360 mg (Lactation) **19–30 years:** 400 mg (M) 310 mg (F) 350 mg (Pregnancy) 310 mg (Lactation) **31–50 years:**
64	Magnesium		Department of Health & Human Services (DHHS)		
65	Magnesium	Magnesium is important for healthy bones. People with higher intakes of magnesium have a higher bone mineral density, which is important in reducing the risk of bone fractures and osteoporosis. Getting more magnesium from foods or dietary supplements might help older women improve their bone mineral density.	Department of Health & Human Services (DHHS)		
66	Magnesium		Department of Health & Human Services (DHHS)		

67	Magnesium		Department of Health & Human Services (DHHS)		420 mg (M) 320 mg (F) 360 mg (Pregnancy) 320 mg (Lactation) **51+ years:** 420 mg (M) 320 mg (F)
68	Magnesium	People who have migraine headaches sometimes have low levels of magnesium in their blood and other tissues. Several small studies found that magnesium supplements can modestly reduce the frequency of migraines.	Department of Health & Human Services (DHHS)		
69	Magnesium	[1] Symptoms of magnesium deficiency include… an abnormal heart rhythm. [2] Magnesium… plays a role in the active transport of calcium and potassium ions across cell membranes, a process that is important to nerve impulse conduction, muscle contraction, and normal heart rhythm…. Early signs of magnesium deficiency include… abnormal heart rhythms.	Department of Health & Human Services (DHHS)		
70	Magnesium	[1] High blood pressure is a major risk factor for cardiovascular disease and stroke. Magnesium supplements might decrease blood pressure, but only by a small amount. Some studies show that people who have more magnesium in their diets have a lower risk of some types of heart disease and stroke. [2] Hypertension is a major risk factor for heart disease and stroke. Studies to date, however, have found that magnesium supplementation lowers blood pressure, at best, to only a small extent. A meta-analysis of 12 clinical trials found that magnesium supplementation for 8–26 weeks in 545 hypertensive participants resulted in only a small reduction (2.2 mmHg) in diastolic blood pressure [31]. The dose of magnesium ranged from approximately 243 to 973 mg/day. The authors of another meta-analysis of 22 studies with 1,173 normotensive and hypertensive adults concluded that magnesium supplementation for 3–24 weeks decreased systolic blood pressure by 3–4 mmHg and diastolic blood pressure by 2–3 mmHg [32]. The effects were somewhat larger when supplemental magnesium intakes of the participants in the nine crossover-design trials	Department of Health & Human Services (DHHS)		

		exceeded 370 mg/day. A diet containing more magnesium because of added fruits and vegetables, more low-fat or nonfat dairy products, and less fat overall was shown to lower systolic and diastolic blood pressure by an average of 5.5 and 3.0 mmHg, respectively.			
71	Manganese	[1] Your body… needs manganese for strong bones	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Manganese-Consumer/ [1] https://ods.od.nih.gov/factsheets/Manganese-HealthProfessional/ [2]	**4–8 years:** 1.5 mg (M+F) **9–13 years:** 1.9 mg (M) 1.6 mg (F)
72	Manganese	[1] Your body… needs manganese for… blood clotting	Department of Health & Human Services (DHHS)		**14–18 years:** 2.2 mg (M) 1.6 mg (F) 2.0 mg (Pregnancy) 2.6 mg (Lactation) **19–50 years:** 2.3 mg (M) 1.8 mg (F) 2.0 mg (Pregnancy) 2.6 mg (Lactation) **51+ years:** 2.3 mg (M) 1.8 mg (F)
73	Molybdenum	Molybdenum… helps break down drugs and toxic substances that enter the body.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Molybdenum-Consumer/	**4–8 years:** 22 mcg **9–13 years:** 34 mcg **14–18 years:** 43 mcg **Adults:** 45 mcg

					Pregnant teens and women: 50 mcg **Lactating teens and women:** 50 mcg
74	Multivitamin/ mineral Supplements	[1] A specific combination of vitamins and minerals can slow down vision loss from age-related macular degeneration (AMD), an eye disease that can blur your central vision. The Age-Related Eye Disease Study (AREDS) showed that people with AMD and/or cataracts who took a daily supplement of high-dose vitamin C (500 mg), vitamin E (400 IU), beta-carotene (15 mg), zinc (80 mg), and copper (2 mg) for about 6 years had a lower chance of developing advanced AMD. They also had less vision loss than those who did not take the supplement. However, the supplements did not reduce the risk of getting AMD or the risk of cataracts. A later study showed that the supplement was equally effective without beta-carotene.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/MVMS-Consumer/ [1] https://ods.od.nih.gov/factsheets/MVMS-HealthProfessional/ [2]	MVMS dosage is not standardized. It's product-specific and guided by the DV for each nutrient
75-76	Potassium	[1] High blood pressure is a major risk factor for coronary heart disease and stroke. People with low intakes of potassium have an increased risk of developing high blood pressure, especially if their diet is high in salt (sodium). Increasing the amount of potassium in your diet and decreasing the amount of sodium might help lower your blood pressure and reduce your risk of stroke.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Potassium-Consumer [1] https://ods.od.nih.gov/factsheets/Potassium-HealthProfessional/#en52 [2]	**4–8 years:** 2,300 mg (M) 2,300 mg (F) **9–13 years:** 2,500 mg (M) 2,300 mg (F) **14–18 years:** 3,000 mg (M) 2,300 mg (F) 2,600 mg (Pregnancy)
77	Potassium	[1] Getting too little potassium can deplete calcium from bones and increase the amount of calcium in urine. This calcium can form hard deposits (stones) in your kidneys, which can be very painful. Increasing the amount of potassium in your diet might reduce your risk of developing kidney stones.	Department of Health & Human Services (DHHS)		

78	Potassium	[1] People who have high intakes of potassium from fruits and vegetables seem to have stronger bones. Eating more of these foods might improve your bone health by increasing bone mineral density (a measure of bone strength).	Department of Health & Human Services (DHHS)		2,500 mg (Lactation) **19–50 years:** 3,400 mg (M) 2,600 mg (F) 2,900 mg (Pregnancy) 2,800 mg (Lactation) **51+ years:** 3,400 mg (M) 2,600 mg (F)
79	Zinc	[1] It helps your immune system fight off invading bacteria and viruses.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Zinc-Consumer/ [1] https://ods.od.nih.gov/factsheets/Zinc-HealthProfessional/ [2]	**4–8 years:** 5 mg (M) 5 mg (F) **9–13 years:** 8 mg (M) 8 mg (F) **14–18 years:** 11 mg (M) 9 mg (F) 12 mg (Pregnancy) 13 mg (Lactation) **19+ years**: 11 mg (M) 8 mg (F) 11 mg (Pregnancy) 12 mg (Lactation)
80	Zinc	[1] During pregnancy, infancy, childhood, and adolescence the body needs zinc to grow and develop properly. Zinc also helps wounds heal and is important for the proper sense of taste.	Department of Health & Human Services (DHHS)		
81	Zinc	[1] Some studies suggest that zinc lozenges or zinc syrup speeds recovery from the common cold if you start taking them at the start of a cold.	Department of Health & Human Services (DHHS)		
82	Zinc	[1] Some studies in lower income countries show that zinc supplements lower the risk of pneumonia in young children.	Department of Health & Human Services (DHHS)		
83-85	Zinc	[1] People with type 2 diabetes often have low zinc levels. Some research shows that zinc supplements might help lower blood sugar and cholesterol levels. However, more research is needed to learn if zinc might be recommended for people with type 2 diabetes. Zinc deficiency causes diarrhea, slow growth, and loss of	Department of Health & Human Services (DHHS)		

		appetite in infants and children. Infants and children who have had a zinc deficiency may have reproductive problems when they become adults. In older children, zinc deficiency also causes hair loss and frequent infections.			
86	Vitamin B5/Pantothenic acid	Because of pantothenic acid's role in triglyceride synthesis and lipoprotein metabolism, experts have hypothesized that pantothenic acid supplementation might reduce lipid levels in patients with hyperlipidemia.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/PantothenicAcid-HealthProfessional/	**Adults:** 600 – 900 mg
87-88	Selenium	[2] Selenium is important for reproduction, thyroid gland function, DNA production, and protecting the body from damage caused by free radicals and from infection…..Epidemiological studies have found associations between low selenium status and increased risk of thyroid disease.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Selenium-Consumer [1] https://ods.od.nih.gov/factsheets/Selenium-HealthProfessional/ [2]	**4–8 years:** 30 mcg (M) 30 mcg (F) **9–13 years:** 40 mcg (M) 40 mcg (F) **14–18 years:** 55 mcg (M) 55 mcg (F) 60 mcg (Pregnancy) 70 mcg (Lactation) **19–50 years:** 55 mcg (M) 55 mcg (F) 60 mcg (Pregnancy) 70 mcg (Lactation) **51+ years** 55 mcg (M) 55 mcg (F)
89	Selenium	[2] Cognitive decline & Alzheimer's - higher selenium intakes might reduce the risk of cognitive decline.	Department of Health & Human Services (DHHS)		
90	Selenium	[2] Keshan Disease - A 2018 systematic review and meta-analysis of 41 studies found that selenium supplements (doses not indicated) reduce the risk of Keshan Disease by 86%.	Department of Health & Human Services (DHHS)		
91	Selenium	[2] Cardiovascular disease - Selenoproteins help reduce inflammation and prevent lipid oxidation and platelet aggregation.	Department of Health & Human Services (DHHS)		
92-93	Asian ginseng (*Panax ginseng*)	Asian ginseng improved many cardiometabolic factors in people with prediabetes and diabetes, ..., total cholesterol, and certain inflammatory markers.	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/asian-ginseng	**Adults:** ≥ 2g p/day

94	Asian ginseng (*Panax ginseng*)	Some research shows that taking oral Asian ginseng seems to improve sexual function in people with erectile dysfunction (ED). Asian ginseng has also been studied in adults with symptoms of ED associated with an enlarged prostate, and one small study suggested it may improve some aspects of sexual function.	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/asian-ginseng	**Adults:** 500 mg BID (M)
95	Ashwagandha (*Withania somnifera*)	The species name somnifera comes from the Latin word for sleep inducing, signifying another purported property of this botanical.	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Ashwagandha-HealthProfessional/	**Adults:** Daily doses fall between 120 mg and 600 mg, most commonly standardized to 5% withanolides
96	Astragalus (*Astragalus membranaceus)*	Taking astragalus may be associated with a lower risk of upper respiratory tract infections in children with nephrotic syndrome than prednisone treatment alone.	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/astragalus	**Adults:** Up to 60 g daily
97	Bromelain (from pineapple. *Ananas comosus*)	A small number of studies have been done on the use of bromelain taken orally (by mouth) for reducing symptoms of sinusitis and reducing pain and swelling after wisdom tooth extraction.	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/bromelain	**Adults:** 900–1000 mg/day
98	Chamomile (*Matricaria recutita, Chamomilla recutita*)	Some preliminary studies suggest that a chamomile dietary supplement might be helpful for generalized anxiety disorder and associated depression.	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/chamomile	Up to 15 g of dried chamomile flowers per day; at least 200 mg (up to 1,500 mg) of chamomile extract per day
99	Chamomile (*Matricaria recutita, Chamomilla recutita*)	Some research has found that products containing certain combinations of herbs that include chamomile may be of benefit for diarrhea in children and for infants with colic.	Department of Health & Human Services (DHHS)		
100	Cranberry (*Vaccinium macrocarpon*)	In general, cranberry products may decrease the overall risk of symptomatic, recurrent UTIs in women by 25 percent, and in some cases, by more than 30 percent.	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/cranberry	120 mg to 1,600 mg per day of cranberry extract; 300 mL – 900 mL

					of cranberry juice daily
101	Elderberry (*Sambucus nigra*)	Some preliminary research suggests that elderberry may relieve symptoms of flu, colds, or other upper respiratory infections.	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/elderberry	15 mL syrup 4 times daily for 5 days; lozenges containing 175 mg elderberry extract, 4 times daily for 2 days
102	Flaxseed (*Linum usitatissimum*)	In pregnant people with gestational diabetes, some research suggests that flaxseed oil supplements containing ALA might improve fasting measures and insulin resistance.	National Institutes of Health	https://www.nccih.nih.gov/health/flaxseed-and-flaxseed-oil	Up to 90 g per day of flaxseed meal
103	Garlic (*Allium sativum*)	Garlic supplements may reduce levels of total cholesterol and low-density lipoprotein (LDL) cholesterol to a small extent in people who have high blood cholesterol levels.	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/garlic	300 mg to 2,400 mg of garlic powder per day; 2.6g of aged garlic daily
104	Ginger (*Zingiber officinale*)	Research shows that ginger may be helpful for nausea and vomiting associated with pregnancy.	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/ginger	1g for four days in pregnancy for nausea
105	Ginkgo (*Ginkgo biloba*)	Ginkgo extract may have a modest benefit for dementia symptoms, particularly at relatively high doses, but the evidence is inconsistent	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/ginkgo	120 – 240 mg standardized extract daily (usually split into 2 or 3 divided doses)
106	Grape (*Vitis* spp.)	A 2020 review of 11 studies (536 participants) showed that grape seed extract may have desirable effects on levels of low-density lipoprotein (LDL) cholesterol and triglycerides but not on total cholesterol and high-density lipoprotein (HDL) cholesterol levels.	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/grape-seed-extract	300 mg/day for 4 months
107	Grape (*Vitis* spp.)	A 2022 review of 19 studies (1,080 participants) showed that grape seed extract reduced diastolic blood pressure (the lower number in a blood pressure reading) but not systolic blood pressure (the higher number).	Department of Health & Human Services (DHHS)		

108	Green Coffee (*Coffea* spp.) Bean	Inhibits fat accumulation, modulates glucose metabolism	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/WeightLoss-HealthProfessional/#coffee	Few safety concerns reported for up to 200 mg/day for as long as 12 weeks
109	Green Tea (*Camellia sinensis*)	The effect of green tea on blood cholesterol levels has been tested in studies in which people were randomly assigned to consume either a green tea product or a placebo. Most of the studies evaluated green tea extract supplements rather than green tea as a beverage. Green tea reduced total cholesterol and low-density lipoprotein (LDL) cholesterol to a small extent, but it did not affect high-density lipoprotein (HDL) cholesterol or triglycerides.	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/green-tea	10 cups of tea daily
110	Lavender (*Lavandula angustifolia*)	One preliminary study with seventy-two postmenopausal women aged 50-65 years suggested that a lavender oil product, taken orally, might offer some relief for menopause-related sexual dysfunction	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/lavender	No standardized dosage range
111	Peppermint (*Mentha × piperita*)	A small amount of research suggests that peppermint oil in enteric-coated capsules may improve IBS symptoms in adults.	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/peppermint-oil	180-225 mg per dose, up to three times daily
112	Turmeric (*Curcuma longa*)	Several meta-analyses have evaluated oral turmeric or curcumin for osteoarthritis measures related to relieving knee pain and stiffness, increasing the strength of the joints, improving joint mobility, and other functions. The initial evidence is positive; higher-quality evidence is needed to reach definitive conclusions, and more research is needed to understand the impact of bioavailability on curcumin's effects.	Department of Health & Human Services (DHHS)	https://www.nccih.nih.gov/health/turmeric	Studies are for curcumin only
113	Omega-3 fatty acids	The eicosanoids made from omega-6s are generally more potent mediators of inflammation, vasoconstriction, and platelet aggregation than those made from omega-3s, although there are some exceptions [3,7]. Because both classes of fatty acids compete for the same desaturation enzymes, ALA is a competitive inhibitor of linoleic acid metabolism and vice versa [8]. Similarly, EPA and DHA can compete with arachidonic acid for the synthesis of	Department of Health & Human Services (DHHS)	https://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional/	1.6 g/day adults

		eicosanoids. Thus, higher concentrations of EPA and DHA than arachidonic acid tip the eicosanoid balance toward less inflammatory activity [9].			
114	Omega-3 fatty acids	Some researchers propose that the relative intakes of omega-6s and omega-3s—the omega-6/omega-3 ratio—may have important implications for the pathogenesis of many chronic diseases, such as cardiovascular disease (CVD) and cancer [8],	Department of Health & Human Services (DHHS)		
115	Fiber	Lowering postprandial blood glucose and/or insulin	FDA	https://www.fda.gov/food/nutrition-food-labeling-and-critical-foods/questions-and-answers-dietary-fiber#beneficial_physiological_effects	3 grams or more per day of beta-glucan soluble fiber from oats or barley. 7 grams or more per day of soluble fiber from psyllium seed husks
116	Fiber	Lowering fasting LDL-cholesterol or fasting blood glucose	FDA		
117	Fiber	Lowering blood pressure	FDA		
118	Fiber	Increased frequency of bowel movements (improved laxation)	FDA		

EXHIBIT 3

Commercial petitioners of each numbered, proposed health claim

Health Claim No	Substance(s)	Commercial Petitioner
1-7	Vitamin A and Carotenoids	Sanacor International, Inc. and Evolution Nutraceuticals, Inc. dba Cardio Miracle
8-11	Boron	Living Fuel International, Inc.
12	Vitamin B1/Thiamin	Sanacor International, Inc. and Evolution Nutraceuticals, Inc. dba Cardio Miracle
13-15	Vitamin B2/Riboflavin	
16	Niacin	
17-20	Vitamin B12/Cobalamin	
21-24	Chromium	Living Fuel International, Inc.
25-27	Vitamin B6	Sanacor International, Inc. and Evolution Nutraceuticals, Inc. dba Cardio Miracle
28-31	Vitamin B9/Folate	
32-34	Calcium	Living Fuel International, Inc.
35	Choline	
36-41	Copper	
42-44	Vitamin C	Sanacor International, Inc. and Evolution Nutraceuticals, Inc. dba Cardio Miracle
45-52	Vitamin D	
53-55	Vitamin E	
56-58	Iodine	Health Ranger Store, Inc.
59-60	Iron	Living Fuel International, Inc.
61-62	Vitamin K	Sanacor International, Inc. and Evolution Nutraceuticals, Inc. dba Cardio Miracle
63-70	Magnesium	
71-72	Manganese	Living Fuel International, Inc.
73	Molybdenum	
74	Multivitamin/mineral Supplements	Health Ranger Store, Inc.
75-78	Potassium	Living Fuel International, Inc.
79-85	Zinc	Sanacor International, Inc. and Evolution Nutraceuticals, Inc. dba Cardio Miracle
86	Vitamin B5/Pantothenic acid	
87-91	Selenium	
92-94	Asian Ginseng (*Panax ginseng*)	Health Ranger Store, Inc.

95	Ashwagandha (*Withania somnifera*)	
96	Astragalus (*Astragalus membranaceus)*	Living Fuel International, Inc.
97	Bromelain (from pineapple. *Ananas comosus*)	Health Ranger Store, Inc.
98-99	Chamomile (*Matricaria recutita, Chamomilla recutita*)	
100	Cranberry (*Vaccinium macrocarpon*)	Sanacor International, Inc. and Evolution Nutraceuticals, Inc. dba Cardio Miracle
101	Elderberry (*Sambucus nigra*)	Health Ranger Store, Inc.
102	Flaxseed (*Linum usitatissimum*)	
103	Garlic (*Allium sativum*)	
104	Ginger (*Zingiber officinale*)	Living Fuel International, Inc.
105	Ginkgo (*Ginkgo biloba*)	Health Ranger Store, Inc.
106-7	Grape (*Vitis* spp.)	Living Fuel International, Inc.
108	Green coffee (*Coffea* spp.) bean	
109	Green tea (*Camellia sinensis*)	
110	Lavender (*Lavandula angustifolia*)	Health Ranger Store, Inc.
111	Peppermint (*Mentha × piperita*)	
112	Turmeric (*Curcuma longa*) root/rhizome	Sanacor International, Inc. and Evolution Nutraceuticals, Inc. dba Cardio Miracle
113-4	Omega-3 fatty acids	Living Fuel International, Inc.
115-8	Fiber	

EXHIBIT 4: SCIENTIFIC REFERENCES

NOTES:

1) **The following scientific references are those cited in the relevant agency publications (Exhibit 2).**
2) **All publicly available scientific publications cited in this online version of this exhibit can be downloaded at the following link.**

CLAIM 1:
Vitamin A reduces the risk of respiratory diseases/pneumonia.

Claim 1, Reference 1
Wiseman EM, Bar-El Dadon S, Reifen R. The vicious cycle of vitamin a deficiency: A review. Crit Rev Food Sci Nutr 2017;57:3703-14. [PubMed abstract]

Claim 1, Reference 2
Stevens GA, Bennett JE, Hennocq Q, Lu Y, De-Regil LM, Rogers L, et al. Trends and mortality effects of vitamin A deficiency in children in 138 low-income and middle-income countries between 1991 and 2013: a pooled analysis of population-based surveys. Lancet Glob Health 2015;3:e528-36. [PubMed abstract]

Claim 1, Reference 3
Timoneda J, Rodriguez-Fernandez L, Zaragoza R, Marin MP, Cabezuelo MT, Torres L, et al. Vitamin A deficiency and the lung. Nutrients 2018;10:1132. [PubMed abstract]

CLAIM 2:

Vitamin A may reduce the risk of premature death.

Claim 2, Reference 1
Wiseman EM, Bar-El Dadon S, Reifen R. The vicious cycle of vitamin a deficiency: A review. Crit Rev Food Sci Nutr 2017;57:3703-14. [PubMed abstract]

Claim 2, Reference 2
Stevens GA, Bennett JE, Hennocq Q, Lu Y, De-Regil LM, Rogers L, et al. Trends and mortality effects of vitamin A deficiency in children in 138 low-income and middle-income countries between 1991 and 2013: a pooled analysis of population-based surveys. Lancet Glob Health 2015;3:e528-36. [PubMed abstract]

Claim 2, Reference 3
Timoneda J, Rodriguez-Fernandez L, Zaragoza R, Marin MP, Cabezuelo MT, Torres L, et al. Vitamin A deficiency and the lung. Nutrients 2018;10:1132. [PubMed abstract]

CLAIM 3:
Natural vitamin A and /or carotenoids in food form may reduce the risk of certain cancers.

Claim 3, Reference 1
Rowles JL, 3rd, Ranard KM, Smith JW, An R, Erdman JW, Jr. Increased dietary and circulating lycopene are associated with reduced prostate cancer risk: a systematic review and meta-analysis. Prostate Cancer Prostatic Dis 2017;20:361-77. [PubMed abstract]

Claim 3, Reference 2
Chen F, Hu J, Liu P, Li J, Wei Z, Liu P. Carotenoid intake and risk of non-Hodgkin lymphoma: a systematic review and dose-response meta-analysis of observational studies. Ann Hematol 2017;96:957-65. [PubMed abstract]

Claim 3, Reference 3
Chen J, Jiang W, Shao L, Zhong D, Wu Y, Cai J. Association between intake of antioxidants and pancreatic cancer risk: a meta-analysis. International Journal of Food Sciences and Nutrition 2016;67:744-53. [PubMed abstract]

Claim 3, Reference 4

Leoncini E, Nedovic D, Panic N, Pastorino R, Edefonti V, Boccia S. Carotenoid intake from natural sources and head and neck cancer: a systematic review and meta-analysis of epidemiological studies. Cancer Epidemiol Biomarkers Prev 2015;24:1003-11. [PubMed abstract]

Claim 3, Reference 5

Li H, He P, Lin T, Guo H, Li Y, Song Y, et al. Association between plasma retinol levels and the risk of all-cause mortality in general hypertensive patients: A nested case-control study. J Clin Hypertens (Greenwich) 2020;22:906-13. [PubMed abstract]

Claim 3, Reference 6

Li X, Xu J. Meta-analysis of the association between dietary lycopene intake and ovarian cancer risk in postmenopausal women. Scientific reports 2014;4:4885. [PubMed abstract]

Claim 3, Reference 7

Wang Q, He C. Dietary vitamin A intake and the risk of ovarian cancer: a meta-analysis. Biosci Rep 2020;40. [PubMed abstract]

Claim 3, Reference 8
Lv W, Zhong X, Xu L, Han W. Association between dietary vitamin A Intake and the risk of glioma: evidence from a meta-analysis. Nutrients 2015;7:8897-904. [PubMed abstract]

Claim 3, Reference 9
Leelakanok N, D'Cunha RR, Sutamtewagul G, Schweizer ML. A systematic review and meta-analysis of the association between vitamin A intake, serum vitamin A, and risk of liver cancer. Nutr Health 2018;24:121-31. [PubMed abstract]

Claim 3, Reference 10
Psaltopoulou T, Ntanasis-Stathopoulos I, Tsilimigras DI, Tzanninis IG, Gavriatopoulou M, Sergentanis TN. Micronutrient intake and risk of hematological malignancies in adults: a systematic review and meta-analysis of cohort studies. Nutr Cancer 2018;70:821-39. [PubMed abstract]

Claim 3, Reference 11
Psaltopoulou T, Ntanasis-Stathopoulos I, Tsilimigras DI, Tzanninis IG, Gavriatopoulou M, Sergentanis TN. Micronutrient intake and risk of hematological malignancies in adults: a systematic review and meta-analysis of cohort studies. Nutr Cancer 2018;70:821-39. [PubMed abstract]

Claim 3, Reference 12
Aune D, Keum N, Giovannucci E, Fadnes LT, Boffetta P, Greenwood DC, et al. Dietary intake and blood concentrations of antioxidants and the risk of cardiovascular disease, total cancer, and all-cause mortality: a systematic review and dose-response meta-analysis of prospective studies. Am J Clin Nutr 2018;108:1069-91. [PubMed abstract]

CLAIM 4:
Dietary supplements containing carotenoids, including beta-carotene, or lutein and zeaxanthin, combined with vitamins C and E, zinc and copper, may reduce the rate of vision loss in people with age-related macular degeneration (AMD).

Claim 4, Reference 1
Fleckenstein M, Keenan TDL, Guymer RH, Chakravarthy U, Schmitz-Valckenberg S, Klaver CC, et al. Age-related macular degeneration. Nat Rev Dis Primers 2021;7:31. [PubMed abstract]

Claim 4, Reference 2
Age-Related Eye Disease Study Research Group. A randomized, placebo-controlled, clinical trial of high-dose supplementation with vitamins C and E, beta carotene, and zinc for age-related macular degeneration and vision loss: AREDS report no. 8. Arch Ophthalmol 2001;119:1417-36. [PubMed abstract]

Claim 4, Reference 3
Age-Related Eye Disease Study 2 Research Group. Lutein + zeaxanthin and omega-3 fatty acids for age-related macular degeneration: the Age-Related Eye Disease Study 2 (AREDS2) randomized clinical trial. JAMA 2013;309:2005-15. [PubMed abstract]

Claim 4, Reference 4
Agron E, Mares J, Clemons TE, Swaroop A, Chew EY, Keenan TDL. Dietary nutrient intake and progression to late age-related macular degeneration in the Age-Related Eye Disease Studies 1 and 2. Ophthalmology 2021;128:425-42. [PubMed abstract]

Claim 4, Reference 5
Chew EY, Clemons TE, Agron E, Domalpally A, Keenan TDL, Vitale S, Weber C, Smith DC, Christen W, for the AREDS2 Research group. Long-term outcomes of adding Lutein/Zeaxanthin and Omega-3 Fatty Acids to the AREDS Supplements on Age-Related Macular Degeneration Progression: AREDS2 Report #28. JAMA Ophthalmology. June 2, 2022. [PubMed abstract]

CLAIM 5:
Vitamin A may reduce the risk of infections, such as measles and diarrhea.

Claim 5, Reference

WHO. *Guideline: Vitamin A supplementation in infants and children 6–59 months of age*. Geneva, Switzerland: WHO; 2011. [https://www.who.int/publications/i/item/9789241501767]

CLAIM 6:
Vitamin A may reduce the risk of anemia.

Claim 6, Reference 1
Wiseman EM, Bar-El Dadon S, Reifen R. The vicious cycle of vitamin a deficiency: A review. Crit Rev Food Sci Nutr 2017;57:3703-14. [PubMed abstract]

Claim 6, Reference 2
Stevens GA, Bennett JE, Hennocq Q, Lu Y, De-Regil LM, Rogers L, et al. Trends and mortality effects of vitamin A deficiency in children in 138 low-income and middle-income countries between 1991 and 2013: a pooled analysis of population-based surveys. Lancet Glob Health 2015;3:e528-36. [PubMed abstract]

Claim 6, Reference 3
Timoneda J, Rodriguez-Fernandez L, Zaragoza R, Marin MP, Cabezuelo MT, Torres L, et al. Vitamin A deficiency and the lung. Nutrients 2018;10:1132. [PubMed abstract]

CLAIM 7:

Vitamin A may reduce the risk of xeropthalmia.

Claim 7, Reference 1
Blaner WS. Vitamin A and Provitamin A Carotenoids. In: Marriott BP, Birt DF, Stallings VA, Yates AA, eds. Present Knowledge in Nutrition. 11th ed. Cambridge, Massachusetts: Wiley-Blackwell; 2020:73-91. [https://shop.elsevier.com/books/present-knowledge-in-nutrition/marriott/978-0-323-66162-1]

Claim 7, Reference 2
Stevens GA, Bennett JE, Hennocq Q, Lu Y, De-Regil LM, Rogers L, et al. Trends and mortality effects of vitamin A deficiency in children in 138 low-income and middle-income countries between 1991 and 2013: a pooled analysis of population-based surveys. Lancet Glob Health 2015;3:e528-36. [PubMed abstract]

Claim 7, Reference 3
Bailey RL, West KP, Jr., Black RE. The epidemiology of global micronutrient deficiencies. Ann Nutr Metab 2015;66 Suppl 2:22-33. [PubMed abstract]

CLAIM 8:

Boron may reduce inflammation in the body.

Claim 8, Reference 1
Nielsen FH. Update on human health effects of boron. J Trace Elem Med Biol 2014;28:383-7. [PubMed abstract]

Claim 8, Reference 2
Scorei R, Mitrut P, Petrisor I, Scorei I. A double-blind, placebo-controlled pilot study to evaluate the effect of calcium fructoborate on systemic inflammation and dyslipidemia markers for middle-aged people with primary osteoarthritis. Biol Trace Elem Res 2011;144:253-63. [PubMed abstract]

Claim 8, Reference 3
Miljkovic D, Scorei RI, Cimpoiasu VM, Scorei ID. Calcium Fructoborate: Plant-Based Dietary Boron for Human Nutrition. Journal of Dietary Supplements 2009;6:211-26. [PubMed abstract]

Claim 8, Reference 4
Mogosanu GD, Bita A, Bejenaru LE, Bejenaru C, Croitoru O, Rau G, et al. Calcium Fructoborate for Bone and Cardiovascular Health. Biol Trace Elem Res 2016;172:277-81. [PubMed abstract]

Claim 8, Reference 5
Newnham RE. Essentiality of boron for healthy bones and joints. Environ Health Perspect 1994;102 Suppl 7:83-5. [PubMed abstract]

CLAIM 9:
Boron may reduce the risk of osteoarthritis.

Claim 9, Reference 1
Nielsen FH. Update on human health effects of boron. J Trace Elem Med Biol 2014;28:383-7. [PubMed abstract]

Claim 9, Reference 2
Scorei R, Mitrut P, Petrisor I, Scorei I. A double-blind, placebo-controlled pilot study to evaluate the effect of calcium fructoborate on systemic inflammation and dyslipidemia markers for middle-aged people with primary osteoarthritis. Biol Trace Elem Res 2011;144:253-63. [PubMed abstract]

Claim 9, Reference 3
Miljkovic D, Scorei RI, Cimpoiasu VM, Scorei ID. Calcium Fructoborate: Plant-Based Dietary Boron for Human Nutrition. Journal of Dietary Supplements 2009;6:211-26. [PubMed abstract]

Claim 9, Reference 4
Mogosanu GD, Bita A, Bejenaru LE, Bejenaru C, Croitoru O, Rau G, et al. Calcium Fructoborate for Bone and Cardiovascular Health. Biol Trace Elem Res 2016;172:277-81. [PubMed abstract]

Claim 9, Reference 5
Newnham RE. Essentiality of boron for healthy bones and joints. Environ Health Perspect 1994;102 Suppl 7:83-5. [PubMed abstract]

CLAIM 10:

Boron may reduce the risk of certain cancers.

Claim 10, Reference 1
Nielsen FH, Eckhert CD. Boron. Adv Nutr 2019; In press. [PubMed abstract]

Claim 10, Reference 2
Uluisik I, Karakaya HC, Koc A. The importance of boron in biological systems. J Trace Elem Med Biol 2018;45:156-62. [PubMed abstract]

Claim 10, Reference 3
Korkmaz M, Uzgoren E, Bakirdere S, Aydin F, Ataman OY. Effects of dietary boron on cervical cytopathology and on micronucleus frequency in exfoliated buccal cells. Environ Toxicol 2007;22:17-25. [PubMed abstract]

Claim 10, Reference 4
Scorei IR. Calcium fructoborate: plant-based dietary boron as potential medicine for cancer therapy. Front Biosci (Schol Ed) 2011;3:205-15. [PubMed abstract]

Claim 10, Reference 5
Cui Y, Winton MI, Zhang ZF, Rainey C, Marshall J, De Kernion JB, et al. Dietary boron intake and prostate cancer risk. Oncol Rep 2004;11:887-92. [PubMed abstract]

Claim 10, Reference 6
Mahabir S, Spitz MR, Barrera SL, Dong YQ, Eastham C, Forman MR. Dietary boron and hormone replacement therapy as risk factors for lung cancer in women. Am J Epidemiol 2008;167:1070-80. [PubMed abstract]

CLAIM 11:

Boron may increase bone strength.

Claim 11, Reference 1
Nielsen FH. Manganese, Molybdenum, Boron, Chromium, and Other Trace Elements. In: John W. Erdman Jr. IAM, Steven H. Zeisel, ed. Present Knowledge in Nutrition. 10th ed: Wiley-Blackwell; 2012:586-607. [https://www.wiley.com/en-us/Present+Knowledge+in+Nutrition%2C+10th+Edition-p-9781119946045]

Claim 11, Reference 2
Hunt C. Boron. In: Coates PM BJ, Blackman MR, Cragg GM, Levine M, Moss J, White JD, ed. Encyclopedia of Dietery Supplements. New York informat healthcare; 2010:82-9. [https://www.taylorfrancis.com/books/edit/10.1201/b14669/encyclopedia-dietary-supplements-paul-coates-marc-blackman-joseph-betz-gordon-cragg-mark-levine-joel-moss-jeffrey-white]

Claim 11, Reference 3
Hunt CD. Dietary boron: progress in establishing essential roles in human physiology. J Trace Elem Med Biol 2012;26:157-60. [PubMed abstract]

Claim 11, Reference 4
Mogosanu GD, Bita A, Bejenaru LE, Bejenaru C, Croitoru O, Rau G, et al. Calcium Fructoborate for Bone and Cardiovascular Health. Biol Trace Elem Res 2016;172:277-81. [PubMed abstract]

Claim 11, Reference 5
Armstrong TA, Spears JW, Crenshaw TD, Nielsen FH. Boron supplementation of a semipurified diet for weanling pigs improves feed efficiency and bone strength characteristics and alters plasma lipid metabolites. J Nutr 2000;130:2575-81. [PubMed abstract]

Claim 11, Reference 6
Chapin RE, Ku WW, Kenney MA, McCoy H, Gladen B, Wine RN, et al. The effects of dietary boron on bone strength in rats. Fundam Appl Toxicol 1997;35:205-15. [PubMed abstract]

Claim 11, Reference 7

Kim MH, Bae YJ, Lee YS, Choi MK. Estimation of boron intake and its relation with bonemineral density in free-living Korean female subjects. Biol Trace Elem Res 2008;125:213-22. [PubMed abstract]

CLAIM 12:

Thiamin may reduce the risk of memory loss, muscle weakness and heart problems.

Claim 12, Reference

Institute of Medicine. Food and Nutrition Board. Dietary Reference Intakes: Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. Washington, DC: National Academy Press; 1998.
[https://www.ncbi.nlm.nih.gov/books/NBK114310/]

CLAIM 13:

Riboflavin may reduce the risk of migraine headaches.

Claim 13, Reference 1
Schoenen J, Jacquy J, Lenaerts M. Effectiveness of high-dose riboflavin in migraine prophylaxis. A randomized controlled trial. Neurology 1998;50:466-70. [PubMed abstract]

Claim 13, Reference 2
Condo M, Posar A, Arbizzani A, Parmeggiani A. Riboflavin prophylaxis in pediatric and adolescent migraine. J Headache Pain 2009;10:361-5. [PubMed abstract]

Claim 13, Reference 3
Bruijn J, Duivenvoorden H, Passchier J, Locher H, Dijkstra N, Arts WF. Medium-dose riboflavin as a prophylactic agent in children with migraine: a preliminary placebo-controlled, randomised, double-blind, cross-over trial. Cephalalgia 2010;30:1426-34. [PubMed abstract]

Claim 13, Reference 4
MacLennan SC, Wade FM, Forrest KM, Ratanayake PD, Fagan E, Antony J. High-dose riboflavin for migraine prophylaxis in children: a double-blind, randomized, placebo-controlled trial. J Child Neurol 2008;23:1300-4. [PubMed abstract]

Claim 13, Reference 5
Holland S, Silberstein SD, Freitag F, Dodick DW, Argoff C, Ashman E. Evidence-based guideline update: NSAIDs and other complementary treatments for episodic migraine prevention in adults: report of the Quality Standards Subcommittee of the American Academy of Neurology and the American Headache Society. Neurology 2012;78:1346-53. [PubMed abstract]

Claim 13, Reference 6
Pringsheim T, Davenport W, Mackie G, Worthington I, Aube M, Christie SN, et al. Canadian Headache Society guideline for migraine prophylaxis. Can J Neurol Sci 2012;39:S1-59. [PubMed abstract]

CLAIM 14:

Riboflavin may reduce the risk of skin disorders, anemia, cataracts, sores at the corners of the mouth, sore throat, liver disorders, and reproductive and nervous system disorders.

Claim 14, Reference 1
Rivlin RS. Riboflavin. In: Coates PM, Betz JM, Blackman MR, et al., eds. Encyclopedia of Dietary Supplements. 2nd ed. London and New York: Informa Healthcare; 2010:691-9. [https://www.taylorfrancis.com/books/edit/10.1201/b14669/encyclopedia-dietary-supplements-paul-coates-marc-blackman-joseph-betz-gordon-cragg-mark-levine-joel-moss-jeffrey-white]

Claim 14, Reference 2
Said HM, Ross AC. Riboflavin. In: Ross AC, Caballero B, Cousins RJ, Tucker KL, Ziegler TR, eds. Modern Nutrition in Health and Disease. 11th ed. Baltimore, MD: Lippincott Williams & Wilkins; 2014:325-30.3. Institute of Medicine. Food and Nutrition Board. Dietary Reference Intakes: Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. Washington, DC: National Academy Press; 1998.

Claim 14, Reference 3
McCormick DB. Vitamin/mineral supplements: of questionable benefit for the general population. Nutr Rev 2010;68:207-13. [PubMed abstract]

CLAIM 15:

Riboflavin may reduce the risk of anemia.

Claim 15, Reference

Rivlin RS. Riboflavin. In: Coates PM, Betz JM, Blackman MR, et al., eds. Encyclopedia of Dietary Supplements. 2nd ed. London and New York: Informa Healthcare; 2010:691-9. [https://www.taylorfrancis.com/books/edit/10.1201/b14669/encyclopedia-dietary-supplements-paul-coates-marc-blackman-joseph-betz-gordon-cragg-mark-levine-joel-moss-jeffrey-white]

CLAIM 16:

Nicotinic acid (at doses of 1600 mg or more daily) may lower LDL ('bad') cholesterol and triglycerides, and raise HDL ('good') cholesterol.

Claim 16, Reference 1
Penberthy WT, Kirkland JB. Niacin. In: Erdman JW, Macdonald IA, Zeisel SH, eds. Present Knowledge in Nutrition, 10th ed. Washington, DC: Wiley-Blackwell; 2012:293-306. [https://onlinelibrary.wiley.com/doi/book/10.1002/9781119946045]

Claim 16, Reference 2
MacKay D, Hathcock J, Guarneri. Niacin: chemical forms, bioavailability, and health effects. Nutr Rev 2012;70:357-66. [PubMed abstract]

Claim 16, Reference 3
The Coronary Drug Project Research Group. Clofibrate and niacin in coronary heart disease. JAMA 1975;231:360-81. [PubMed abstract]

Claim 16, Reference 4
Berge KG, Canner PL. Coronary drug project: Experience with niacin. Eur J Clin Pharmacol 1991;40:S49-51. [PubMed abstract]

Claim 16, Reference 5
Canner PL, Berge KG, Wenger NK, Stamler J, Friedman L, Prineas RJ. Friedewald W. Fifteen year mortality in Coronary Drug Project patients: Long-term benefit with niacin. J Am Coll Cardiol 1986;8:1245-55. [PubMed abstract]

CLAIM 17:

Vitamin B12, vitamin B6 and folate may reduce the risk of heart attack or stroke in people with sub-normal blood levels of homocysteine.

Claim 17, Reference 1
Green R, Allen LH, Bjorke-Monsen AL, Brito A, Gueant JL, Miller JW, et al. Vitamin B12 deficiency. Nat Rev Dis Primers 2017;3:17040. [PubMed abstract]

Claim 17, Reference 2
Djuric D, Jakovljevic V, Zivkovic V, Srejovic I. Homocysteine and homocysteine-related compounds: An overview of the roles in the pathology of the cardiovascular and nervous systems. Can J Physiol Pharmacol 2018;96:991-1003. [PubMed abstract]

Claim 17, Reference 3
Oliai Araghi S, Kiefte-de Jong JC, van Dijk SC, Swart KMA, Ploegmakers KJ, Zillikens MC, et al. Long-term effects of folic acid and vitamin-B12 supplementation on fracture risk and cardiovascular disease: Extended follow-up of the B-PROOF trial. Clin Nutr 2021;40:1199-1206. [PubMed abstract]

CLAIM 18:

Vitamin B12 may reduce the risk of megaloblastic anemia.

Claim 18, Reference

Stabler SP. Vitamin B12. In: Marriott BP, Birt DF, Stallings VA, Yates AA, eds. Present Knowledge in Nutrition. 11th ed. Washington, DC: Elsevier; 2020:257-71. [https://shop.elsevier.com/books/present-knowledge-in-nutrition/marriott/978-0-323-66162-1]

CLAIM 19:

Vitamin B12 may reduce the risk of pernicious anemia.

Claim 19, Reference

Stabler SP. Vitamin B12. In: Marriott BP, Birt DF, Stallings VA, Yates AA, eds. Present Knowledge in Nutrition. 11th ed. Washington, DC: Elsevier; 2020:257-71. [https://shop.elsevier.com/books/present-knowledge-in-nutrition/marriott/978-0-323-66162-1]

CLAIM 20:

Vitamin B12 may reduce the risk of certain neurological problems.

Claim 20, Reference 1
Langan RC, Goodbred AJ. Vitamin B12 deficiency: Recognition and management. Am Fam Physician 2017;96:384-9. [PubMed abstract]

Claim 20, Reference 2
Clarke R. B-vitamins and prevention of dementia. Proc Nutr Soc 2008;67:75-81. [PubMed abstract]

CLAIM 21:

Chromium may reduce the risk of impaired glucose tolerance.

Claim 21, Reference 1
Costello RB, Dwyer JT, Merkel JM. Chromium supplements in health and disease. In: Vincent JB, ed. The Nutritional Biochemistry of Chromium (III). Cambridge, MA: Elsevier; 2019:219-59. [https://www.sciencedirect.com/book/9780444641212/the-nutritional-biochemistry-of-chromium-iii]

Claim 21, Reference 2
Anderson RA, Cheng N, Bryden NA, Polansky MM, Cheng N, Chi J, et al. Elevated intakes of supplemental chromium improve glucose and insulin variables in individuals with type 2 diabetes. Diabetes 1997;46:1786-91. [PubMed abstract]

Claim 21, Reference 3
National Institute of Diabetes and Digestive and Kidney Diseases. The A1C Test & Diabetes. 2018.

Claim 21, Reference 4
Costello RB, Dwyer JT, Bailey RL. Chromium supplements for glycemic control in type 2 diabetes: limited evidence of effectiveness. Nutr Rev 2016;74:455-68. [PubMed abstract]

Claim 21, Reference 5
Wang ZQ, Cefalu WT. Current concepts about chromium supplementation in type 2 diabetes and insulin resistance. Curr Diab Rep 2010;10:145-51. [PubMed abstract]

Claim 21, Reference 6
Cefalu WT, Rood J, Pinsonat P, Qin J, Sereda O, Levitan L, et al. Characterization of the metabolic and physiologic response to chromium supplementation in subjects with type 2 diabetes mellitus. Metabolism 2010;59:755-62. [PubMed abstract]

CLAIM 22:

Chromium may reduce the risk of type 2 diabetes

Claim 22, Reference 1
Costello RB, Dwyer JT, Merkel JM. Chromium supplements in health and disease. In: Vincent JB, ed. The Nutritional Biochemistry of Chromium (III). Cambridge, MA: Elsevier; 2019:219-59. [https://www.sciencedirect.com/book/9780444641212/the-nutritional-biochemistry-of-chromium-iii]

Claim 22, Reference 2
Anderson RA, Cheng N, Bryden NA, Polansky MM, Cheng N, Chi J, et al. Elevated intakes of supplemental chromium improve glucose and insulin variables in individuals with type 2 diabetes. Diabetes 1997;46:1786-91. [PubMed abstract]

Claim 22, Reference 3
Vincent JB. Chromium In: Marriott BP, Birt DF, Stallings VA, Yates AY, eds. Present Knowledge in Nutrition 11th ed. Cambridge, MA: Elsevier; 2020:457-65. [https://shop.elsevier.com/books/present-knowledge-in-nutrition/marriott/978-0-323-66162-1]

Claim 22, Reference 4
Costello RB, Dwyer JT, Merkel JM. Chromium supplements in health and disease. In: Vincent JB, ed. The Nutritional Biochemistry of Chromium (III). Cambridge, MA: Elsevier; 2019:219-59. [https://www.sciencedirect.com/book/9780444641212/the-nutritional-biochemistry-of-chromium-iii]

Claim 22, Reference 5
Wang ZQ, Cefalu WT. Current concepts about chromium supplementation in type 2 diabetes and insulin resistance. Curr Diab Rep 2010;10:145-51. [PubMed abstract]

Claim 22, Reference 6
Trumbo PR, Ellwood KC. Chromium picolinate intake and risk of type 2 diabetes: an evidence-based review by the United States Food and Drug Administration. Nutr Rev 2006;64:357-63. [PubMed abstract]

CLAIM 23:

Chromium may reduce the risk of insulin resistance.

Claim 23, Reference 1
Costello RB, Dwyer JT, Merkel JM. Chromium supplements in health and disease. In: Vincent JB, ed. The Nutritional Biochemistry of Chromium (III). Cambridge, MA: Elsevier; 2019:219-59.

Claim 23, Reference 2
Anderson RA, Cheng N, Bryden NA, Polansky MM, Cheng N, Chi J, et al. Elevated intakes of supplemental chromium improve glucose and insulin variables in individuals with type 2 diabetes. Diabetes 1997;46:1786-91. [PubMed abstract]

Claim 23, Reference 3
Wang ZQ, Cefalu WT. Current concepts about chromium supplementation in type 2 diabetes and insulin resistance. Curr Diab Rep 2010;10:145-51. [PubMed abstract]

Claim 23, Reference 4
Cefalu WT, Rood J, Pinsonat P, Qin J, Sereda O, Levitan L, et al. Characterization of the metabolic and physiologic response to chromium supplementation in subjects with type 2 diabetes mellitus. Metabolism 2010;59:755-62. [PubMed abstract]

Claim 23, Reference 5
Trumbo PR, Ellwood KC. Chromium picolinate intake and risk of type 2 diabetes: an evidence-based review by the United States Food and Drug Administration. Nutr Rev 2006;64:357-63. [PubMed abstract]

CLAIM 24:

Chromium may reduce the risk of metabolic syndrome.

Claim 24, Reference 1
National Heart Lung and Blood Institute. Metabolic Syndrome. 2019.

Claim 24, Reference 2
Iqbal N, Cardillo S, Volger S, Bloedon LT, Anderson RA, Boston R, et al. Chromium picolinate does not improve key features of metabolic syndrome in obese nondiabetic adults. Metab Syndr Relat Disord 2009;7:143-50. [PubMed abstract]

Claim 24, Reference 3
Bai J, Xun P, Morris S, Jacobs DR, Jr., Liu K, He K. Chromium exposure and incidence of metabolic syndrome among American young adults over a 23-year follow-up: the CARDIA Trace Element Study. Sci Rep 2015;5:15606. [PubMed abstract]

Claim 24, Reference 4
Ali A, Ma Y, Reynolds J, Wise JP, Sr., Inzucchi SE Katz DL (2011). Chromium effects on glucose tolerance and insulin sensitivity in persons at risk for diabetes mellitus. Endocr Pract 17:16-25. [PubMed abstract]

Claim 24, Reference 5
Nussbaumerova B, Rosolova H, Krizek M, Sefrna F, Racek J, Muller L, et al. Chromium supplementation reduces resting heart rate in patients with metabolic syndrome and impaired glucose tolerance. Biol Trace Elem Res 2018;183:192-199. [PubMed abstract]

Claim 24, Reference 6
Kim HN, Kim SH, Eun YM, Song SW. Effects of zinc, magnesium, and chromium supplementation on cardiometabolic risk in adults with metabolic syndrome: A double-blind, placebo-controlled randomised trial. J Trace Elem Med Biol 2018;48:166-71. [PubMed abstract]

CLAIM 25:

Folate (500-5000 mcg DFE/d), vitamin B12 (1000-5000 mcg DFE/d) and vitamin B6 (20-25 mg DFE/d) may lower the risk of cardiovascular disease.

Claim 25, Reference 1
Institute of Medicine. Food and Nutrition Board. Dietary Reference Intakes: Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. Washington, DC: National Academy Press; 1998.

Claim 25, Reference 2
Ebbing M, Bonaa KH, Arnesen E, Ueland PM, Nordrehaug JE, Rasmussen K, et al. Combined analyses and extended follow-up of two randomized controlled homocysteine-lowering B-vitamin trials. J Intern Med 2010;268:367-82. [PubMed abstract]

Claim 25, Reference 3
Saposnik G, Ray JG, Sheridan P, McQueen M, Lonn E. Homocysteine-lowering therapy and stroke risk, severity, and disability: additional findings from the HOPE 2 trial. Stroke 2009;40:1365-72. [PubMed abstract]

Claim 25, Reference 4
Albert CM, Cook NR, Gaziano JM, Zaharris E, MacFadyen J, Danielson E, et al. Effect of folic acid and B vitamins on risk of cardiovascular events and total mortality among women at high risk for cardiovascular disease: a randomized trial. JAMA 2008;299:2027-36. [PubMed abstract]

Claim 25, Reference 5
Toole JF, Malinow MR, Chambless LE, Spence JD, Pettigrew LC, Howard VJ, et al. Lowering homocysteine in patients with ischemic stroke to prevent recurrent stroke, myocardial infarction, and death: the Vitamin Intervention for Stroke Prevention (VISP) randomized controlled trial. JAMA 2004;291:565-75. [PubMed abstract]

CLAIM 26:

Vitamin B6 helps reduce the risk of abnormal brain development in the fetuses of pregnant women.

Claim 26, Reference 1

No supporting references cited.

CLAIM 27:

Vitamin B6 supplementation may reduce the risk of vitamin B6 deficiency, the symptoms of which include: anemia, itchy rashes, scaly skin on the lips, cracks at the corners of the mouth, swollen tongue, depression, confusion, or a weak immune system. In infants, vitamin B6 deficiency may include irritability, extreme sensitivity in hearing, or seizures.

Claim 27, Reference 1
McCormick D. Vitamin B6. In: Bowman B, Russell R, eds. Present Knowledge in Nutrition. 9th ed. Washington, DC: International Life Sciences Institute; 2006. [https://www.semanticscholar.org/paper/Present-Knowledge-in-Nutrition-9th-ed%2C-Vol-1-(526-2-Hudson/a91893a66bc22ae9b385b522969c033e2257951b]

Claim 27, Reference 2
Institute of Medicine. Food and Nutrition Board. Dietary Reference Intakes: Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. Washington, DC: National Academy Press; 1998.

Claim 27, Reference 3
Mackey A, Davis S, Gregory J. Vitamin B6. In: Shils M, Shike M, Ross A, Caballero B, Cousins R, eds. Modern Nutrition in Health and Disease. 10th ed. Baltimore, MD: Lippincott Williams & Wilkins; 2005. [https://www.ncbi.nlm.nih.gov/nlmcatalog/101248134]

CLAIM 28:

Food forms of folate may decrease the risk of several forms of cancer. Folic acid (pteroylmonoglutamic acid) taken at the recommended amounts (400 mcg DFE/day for children of 14 years and older and adults, except pregnant women, who should take 600 mcg DFE/day and lactating women, who should take 500 mcg DFE/day) may help reduce the risk of certain forms of cancer.

Claim 28, Reference 1
Bailey LB, Caudill MA. Folate. In: Erdman JW, Macdonald IA, Zeisel SH, eds. Present Knowledge in Nutrition. 10th ed. Washington, DC: Wiley-Blackwell; 2012:321-42. [https://onlinelibrary.wiley.com/doi/book/10.1002/9781119946045]

Claim 28, Reference 2
Bailey LB, Stover PJ, McNulty H, et al. Biomarkers of nutrition for development-folate review. J Nutr 2015;145:1636S-80S. [PubMed abstract]

Claim 28, Reference 3
He H, Shui B. Folate intake and risk of bladder cancer: a meta-analysis of epidemiological studies. Int J Food Sci Nutr 2014;65:286-92. [PubMed abstract]

Claim 28, Reference 4
Kim YI. Will mandatory folic acid fortification prevent or promote cancer? Am J Clin Nutr 2004;80:1123-8. [PubMed abstract]

Claim 28, Reference 5
Kim YI. Folate and carcinogenesis: evidence, mechanisms, and implications. J Nutr Biochem 1999;10:66-88. [PubMed abstract]

Claim 28, Reference 6
Kim YI. Folate and cancer: a tale of Dr. Jekyll and Mr. Hyde? Am J Clin Nutr 2018;107:139-42. [PubMed abstract]

Claim 28, Reference 7
Mason JB. Unraveling the complex relationship between folate and cancer risk. Biofactors 2011;37:253-60. [PubMed abstract]

Claim 28, Reference 8
Giovannucci E, Stampfer MJ, Colditz GA, et al. Folate, methionine, and alcohol intake and risk of colorectal adenoma. J Natl Cancer Inst 1993;85:875-84. [PubMed abstract]

Claim 28, Reference 9
Gibson TM, Weinstein SJ, Pfeiffer RM, et al. Pre- and postfortification intake of folate and risk of colorectal cancer in a large prospective cohort study in the United States. Am J Clin Nutr 2011;94:1053-62. [PubMed abstract]

Claim 28, Reference 10
Sanjoaquin MA, Allen N, Couto E, et al. Folate intake and colorectal cancer risk: a meta-analytical approach. Int J Cancer 2005;113:825-8. [PubMed abstract]

Claim 28, Reference 11
Kennedy DA, Stern SJ, Moretti M, et al. Folate intake and the risk of colorectal cancer: a systematic review and meta-analysis. Cancer Epidemiol 2011;35:2-10. [PubMed abstract]

Claim 28, Reference 12
Gibson TM, Weinstein SJ, Pfeiffer RM, et al. Pre- and postfortification intake of folate and risk of colorectal cancer in a large prospective cohort study in the United States. Am J Clin Nutr 2011;94:1053-62. [PubMed abstract]

CLAIM 29:

Folate supplements in the methylated form (5-methyltetrahydrofolate, or 5-MTHF) may reduce the risk of depression.

Claim 29, Reference 1
Huang X, Fan Y, Han X, et al. Association between serum vitamin levels and depression in U.S. adults 20 years or older based on National Health and Nutrition Examination Survey 2005-2006. Int J Environ Res Public Health 2018;15. [PubMed abstract]

Claim 29, Reference 2
Roberts E, Carter B, Young AH. Caveat emptor: Folate in unipolar depressive illness, a systematic review and meta-analysis. J Psychopharmacol 2018;32:377-84. [PubMed abstract]

Claim 29, Reference 3
Sarris J, Murphy J, Mischoulon D, et al. Adjunctive nutraceuticals for depression: A systematic review and meta-analyses. Am J Psychiatry 2016;173:575-87. [PubMed abstract]

Claim 29, Reference 4
Cleare A, Pariante CM, Young AH, et al. Evidence-based guidelines for treating depressive disorders with antidepressants: a revision of the 2008 British Association for Psychopharmacology guidelines. J Psychopharmacol 2015;29:459-525. [PubMed abstract]

Claim 29, Reference 5
Ravindran AV, Balneaves LG, Faulkner G, et al. Canadian Network for Mood and Anxiety Treatments (CANMAT) 2016 clinical guidelines for the management of adults with major depressive disorder: Section 5. Complementary and Alternative medicine treatments. Can J Psychiatry 2016;61:576-87. [PubMed abstract]

Claim 29, Reference 6
Papakostas GI, Shelton RC, Zajecka JM, et al. L-methylfolate as adjunctive therapy for SSRI-resistant major depression: results of two randomized, double-blind, parallel-sequential trials. Am J Psychiatry 2012;169:1267-74. [PubMed abstract]

Claim 29, Reference 7
Roberts E, Carter B, Young AH. Caveat emptor: Folate in unipolar depressive illness, a systematic review and meta-analysis. J Psychopharmacol 2018;32:377-84. [PubMed abstract]

Claim 29, Reference 8

Cleare A, Pariante CM, Young AH, et al. Evidence-based guidelines for treating depressive disorders with antidepressants: a revision of the 2008 British Association for Psychopharmacology guidelines. J Psychopharmacol 2015;29:459-525. [PubMed abstract]

CLAIM 30:

Vitamin B12 and folate supplementation may reduce the risk of megaloblastic anemia.

Claim 30, Reference

Bailey LB, Caudill MA. Folate. In: Erdman JW, Macdonald IA, Zeisel SH, eds. Present Knowledge in Nutrition. 10th ed. Washington, DC: Wiley-Blackwell; 2012:321-42. [onlinelibrary.wiley.com/doi/book/10.1002/9781119946045]

CLAIM 31:

Adequate folate intake (600 mcg DFE/day) before conception and in the earliest days and weeks of pregnancy may reduce the risk of abnormal fetal brain and spine development.

Claim 31, Reference 1
Lamers Y. Folate recommendations for pregnancy, lactation, and infancy. Ann Nutr Metab 2011;59:32-7. [PubMed abstract]

Claim 31, Reference 2
Stover PJ. Folic acid. In: Ross AC, Caballero B, Cousins RJ, Tucker KL, Ziegler TR, eds. Modern Nutrition in Health and Disease. 11th ed. Baltimore, MD: Lippincott Williams & Wilkins; 2012:358-68. [https://pure.johnshopkins.edu/en/publications/modern-nutrition-in-health-and-disease-eleventh-edition]

Claim 31, Reference 3
Wilson RD, Genetics C, Motherisk. Pre-conceptional vitamin/folic acid supplementation 2007: the use of folic acid in combination with a multivitamin supplement for the prevention of neural tube defects and other congenital anomalies. J Obstet Gynaecol Can 2007;29:1003-13. [PubMed abstract]

Claim 31, Reference 4
Pitkin RM. Folate and neural tube defects. Am J Clin Nutr 2007;85:285S-8S. [PubMed abstract]

Claim 31, Reference 5
Scott JM. Evidence of folic acid and folate in the prevention of neural tube defects. Bibl Nutr Dieta 2001:192-5. [PubMed abstract]

Claim 31, Reference 6
Molloy AM, Kirke PN, Brody LC, et al. Effects of folate and vitamin B12 deficiencies during pregnancy on fetal, infant, and child development. Food Nutr Bull 2008;29:S101-11; discussion S12-5. [PubMed abstract]

Claim 31, Reference 7
Institute of Medicine. Food and Nutrition Board. Dietary Reference Intakes: Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. Washington, DC: National Academy Press; 1998. [https://www.ncbi.nlm.nih.gov/books/NBK114310/]

Claim 31, Reference 8
Centers for Disease Control and Prevention. Folic acid 2012.

Claim 31, Reference 9
Centers for Disease Control and Prevention. MTHFR Gene, Folic Acid, and Preventing Neural Tube Defects. 2022.

Claim 31, Reference 10
Viswanathan M, Treiman KA, Kish-Doto J, et al. Folic acid supplementation for the prevention of neural tube defects: an updated evidence report and systematic review for the US Preventive Services Task Force. JAMA 2017;317:190-203. [PubMed abstract]

Claim 31, Reference 11
U. S. Preventive Services Task Force, Bibbins-Domingo K, Grossman DC, et al. Folic acid supplementation for the prevention of neural tube defects: US Preventive Services Task Force recommendation statement. JAMA 2017;317:183-9. [PubMed abstract]

Claim 31, Reference 12
Centers for Disease Control and Prevention. Use of folic acid for prevention of spina bifida and other neural tube defects--1983-1991. MMWR Morb Mortal Wkly Rep 1991;40:513-6. [PubMed abstract]

CLAIM 32:

Calcium supplements may reduce the risk of preeclampsia in pregnant women who consume too little calcium in their normal diet.

Claim 32, Reference 1
American College of Obstetricians and Gynecologists' Task Force on Hypertension in Pregnancy. Hypertension in pregnancy. Report of the American College of Obstetricians and Gynecologists' Task Force on Hypertension in Pregnancy. Obstet Gynecol 2013;122:1122-31. [PubMed abstract]

Claim 32, Reference 2
World Health Organization. Guideline: Calcium Supplementation in Pregnant Women. Geneva: World Health Organization; 2013. [PubMed abstract]

Claim 32, Reference 3
Hofmeyr GJ, Lawrie TA, Atallah Á, Torloni MR. Calcium supplementation during pregnancy for preventing hypertensive disorders and related problems. Cochrane Database of Systematic Reviews 2018. [PubMed abstract]

Claim 32, Reference 4
Tang R, Tang IC, Henry A, Welsh A. Limited evidence for calcium supplementation in preeclampsia prevention: a meta-analysis and systematic review. Hypertens Pregnancy 2015;34:181-203. [PubMed abstract]

Claim 32, Reference 5
World Health Organization. WHO Recommendation: Calcium Supplementation During Pregnancy for Prevention of Pre-eclampsia and Its Complications. Geneva: World Health Organization; 2018. [PubMed abstract]

Claim 32, Reference 6 Magee LA, Pels A, Helewa M, Rey E, von Dadelszen P. Diagnosis, evaluation, and management of the hypertensive disorders of pregnancy: executive summary. J Obstet Gynaecol Can 2014;36:416-41. [PubMed abstract]

Claim 32, Reference 7

Tranquilli AL, Dekker G, Magee L, Roberts J, Sibai BM, Steyn W, et al. The classification, diagnosis and management of the hypertensive disorders of pregnancy: A revised statement from the ISSHP. Pregnancy Hypertens 2014;4:97-104. [PubMed abstract]

Claim 32, Reference 8

Lowe SA, Bowyer L, Lust K, McMahon LP, Morton M, North RA, et al. SOMANZ guidelines for the management of hypertensive disorders of pregnancy 2014. Aust N Z J Obstet Gynaecol 2015;55:e1-29. [PubMed abstract]

CLAIM 33:

For those with low calcium status, increasing calcium intake may reduce the risk of metabolic syndrome.

Claim 33, Reference 1
Moore-Schiltz L, Albert JM, Singer ME, Swain J, Nock NL. Dietary intake of calcium and magnesium and the metabolic syndrome in the National Health and Nutrition Examination (NHANES) 2001-2010 data. Br J Nutr 2015;114:924-35. [PubMed abstract]

Claim 33, Reference 2
Han D, Fang X, Su D, Huang L, He M, Zhao D, et al. Dietary calcium intake and the risk of metabolic syndrome: a systematic review and meta-analysis. Sci Rep 2019;9:19046. [PubMed abstract]

Claim 33, Reference 3
Asemi Z, Raygan F, Bahmani F, Rezavandi Z, Talari HR, Rafiee M, et al. The effects of vitamin D, K and calcium co-supplementation on carotid intima-media thickness and metabolic status in overweight type 2 diabetic patients with CHD. Br J Nutr 2016;116:286-93. [PubMed abstract]

CLAIM 34:

Normalizing calcium status may reduce the risk of osteoporosis and osteomalacia.

Claim 34, Reference 1

Institute of Medicine. Dietary Reference Intakes for Calcium and Vitamin D. Washington, DC: The National Academies Press; 2011.

Claim 34, Reference 2

Sempos CT, Durazo-Arvizu RA, Fischer PR, Munns CF, Pettifor JM, Thacher TD. Serum 25-hydroxyvitamin D requirements to prevent nutritional rickets in Nigerian children on a low-calcium diet—a multivariable renanalysis. Am J Clin Nutr 2021;114:231-7. [PubMed abstract]

CLAIM 35:

Choline may reduce the risk of non-alcoholic fatty liver disease/metabolic dysfunction–associated steatotic liver disease (NAFLD/MASLD)

Claim 35: Reference 1
Zeisel SH, Corbin KD. Choline. In: Erdman JW, Macdonald IA, Zeisel SH, eds. Present Knowledge in Nutrition. 10th ed. Washington, DC: Wiley-Blackwell; 2012:405-18.

Claim 35: Reference 2
Corbin KD, Zeisel SH. Choline metabolism provides novel insights into nonalcoholic fatty liver disease and its progression. Curr Opin Gastroenterol 2012;28:159-65. [PubMed abstract]

Claim 35: Reference 3
Buchman AL, Dubin MD, Moukarzel AA, Jenden DJ, Roch M, Rice KM, et al. Choline deficiency: a cause of hepatic steatosis during parenteral nutrition that can be reversed with intravenous choline supplementation. Hepatology 1995;22:1399-403. [PubMed abstract]

Claim 35: Reference 4
Fischer LM, daCosta KA, Kwock L, Stewart PW, Lu TS, Stabler SP, et al. Sex and menopausal status influence human dietary requirements for the nutrient choline. Am J Clin Nutr 2007;85:1275-85. [PubMed abstract]

CLAIM 36:
If your copper status is low, copper supplementation may reduce the risk of skin discoloration patches (*pityriasis alba*).

CLAIM 37:
If your copper status is low, copper supplementation may reduce the risk of high blood cholesterol.

CLAIM 38:
If your copper status is low, copper supplementation may reduce the risk of loss of balance and coordination.

CLAIM 39:
If your copper status is low, copper supplementation may reduce your risk of infection.

CLAIM 40:
If your copper status is low, copper supplementation may reduce your risk of connective tissue disorders affecting the ligaments and skin.

CLAIM 41:
If your copper status is low, copper supplementation may reduce your risk of weak and brittle bones.

Claims 36-41, Reference 1
Collins JF. Copper. In: Ross AC, Caballero B, Cousins RJ, Tucker KL, Ziegler TR, eds. Modern Nutrition in Health and Disease. 11th ed. Baltimore, MD: Lippincott Williams & Wilkins; 2014:206-16.

Claims 36-41, Reference 2
Fairweather-Tait SJ, Harvey LJ, Collings R. Risk-benefit analysis of mineral intakes: case studies on copper and iron. Proc Nutr Soc 2011;70:1-9. [PubMed abstract]

Claims 36-41, Reference 3
Prohaska JR. Impact of copper deficiency in humans. Ann N Y Acad Sci 2014;1314:1-5. [PubMed abstract]

CLAIM 42:
Vitamin C helps the body make collagen needed for wound healing.

Claim 42, Reference 1

Li Y, Schellhorn HE. New developments and novel therapeutic perspectives for vitamin C. J Nutr 2007;137:2171-84. [PubMed abstract]

Claim 42, Reference 2

Carr AC, Frei B. Toward a new recommended dietary allowance for vitamin C based on antioxidant and health effects in humans. Am J Clin Nutr 1999;69:1086-107. [PubMed abstract]

CLAIM 43:

Vitamin C helps support the proper function of the immune system needed to protect the body from infections.

Claim 43, Reference 1

Jacob RA, Sotoudeh G. Vitamin C function and status in chronic disease. Nutr Clin Care 2002;5:66-74. [PubMed abstract]

Claim 43, Reference 2

Gershoff SN. Vitamin C (ascorbic acid): new roles, new requirements? Nutr Rev 1993;51:313-26. [PubMed abstract]

CLAIM 44:

Vitamin C, in combination with vitamin E, lutein, zeaxanthin, zinc, copper, may help reduce the risk of age-related macular degeneration (AMD).

Claim 44, Reference 1

Age-Related Eye Disease Study Research Group. A randomized, placebo-controlled, clinical trial of high-dose supplementation with vitamins C and E, beta carotene, and zinc for age-related macular degeneration and vision loss: AREDS report no. 8. Arch Ophthalmol 2001;119:1417-36. [PubMed abstract]

Claim 44, Reference 2

The Age-Related Eye Disease Study 2 (AREDS2) Research Group. Lutein + zeaxanthin and omega-3 fatty acids for age-related macular degeneration: the Age-Related Eye Disease Study 2 (AREDS2) randomized clinical trial. JAMA 2013;309:2005-15. [PubMed abstract]

CLAIM 45:

Vitamin D reduces the risk of rickets in children.

CLAIM 46:

Vitamin D reduces the risk of osteomalacia (in adults).

Claims 45-46, Reference 1
Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes for Calcium and Vitamin D. Washington, DC: National Academy Press, 2010.

Claims 45-46, Reference 2
Norman AW, Henry HH. Vitamin D. In: Erdman JW, Macdonald IA, Zeisel SH, eds. Present Knowledge in Nutrition, 10th ed. Washington DC: Wiley-Blackwell, 2012.

Claims 45-46, Reference 3
Jones G. Vitamin D. In: Ross AC, Caballero B, Cousins RJ, Tucker KL, Ziegler TR, eds. Modern Nutrition in Health and Disease, 11th ed. Philadelphia: Lippincott Williams & Wilkins, 2014.

Claims 45-46, Reference 4
Uday S, Hogler W. Nutritional rickets and osteomalacia in the twenty-first century: Revised concepts, public health, and prevention strategies. Curr Osteoporos Rep 2017;15:293-302. [PubMed abstract]

CLAIM 47:

Vitamin D may reduce the risk of weak, painful muscles.

CLAIM 48:

Vitamin D may reduce the risk of loss of balance and falls in the elderly.

Claims 47-48, Reference

Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes for Calcium and Vitamin D. Washington, DC: National Academy Press, 2010.

CLAIM 49:

Vitamin D supplementation may reduce the risk of infection by pathogenic bacteria and viruses.

Claim 49, Reference 1
Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes for Calcium and Vitamin D. Washington, DC: National Academy Press, 2010.

Claim 49, Reference 2
Norman AW, Henry HH. Vitamin D. In: Erdman JW, Macdonald IA, Zeisel SH, eds. Present Knowledge in Nutrition, 10th ed. Washington DC: Wiley-Blackwell, 2012.

Claim 49, Reference 3
Jones G. Vitamin D. In: Ross AC, Caballero B, Cousins RJ, Tucker KL, Ziegler TR, eds. Modern Nutrition in Health and Disease, 11th ed. Philadelphia: Lippincott Williams & Wilkins, 2014.

CLAIM 50:

Vitamin D may reduce the risk of high blood pressure (hypertension).

Claim 50, Reference 1

Beveridge LA, Struthers AD, Khan F, Jorde R, Scragg R, Macdonald HM, et al. Effect of vitamin D supplementation on blood pressure: A systematic review and meta-analysis incorporating individual patient data. JAMA Intern Med 2015;175:745-54. [PubMed abstract]

Claim 50, Reference 2

Golzarand M, Shab-Bidar S, Koochakpoor G, Speakman JR, Djafarian K. Effect of vitamin D3 supplementation on blood pressure in adults: An updated meta-analysis. Nutr Metab Cardiovasc Dis 2016;26:663-73. [PubMed abstract]

CLAIM 51:

Vitamin D may reduce the risk of high blood cholesterol levels.

Claim 51, Reference

Dibaba DT. Effect of vitamin D supplementation on serum lipid profiles: A systematic review and meta-analysis. Nutr Rev 2019;77:890-902. [PubMed abstract]

CLAIM 52:

Vitamin D may reduce the risk of developing multiple sclerosis (MS).

Claim 52, Reference 1
MedLinePlus. Multiple sclerosis. 2020.

Claim 52, Reference 2
Jagannath VA, Filippini G, Di Pietrantonj C, Asokan GV, Robak EW, Whamond L, Robinson SA. Vitamin D for the management of multiple sclerosis (review). Cochrane Database of Systematic Reviews 2018, issue 9, Art. No.: CD008422. DOI: 10.1002/14651858.CD008422.pub3. [PubMed abstract]

Claim 52, Reference 3
Sintzel MB, Rametta M, Reder AT. Vitamin D and multiple sclerosis: A comprehensive review. Neurol Ther 2018;7:59-85. [PubMed abstract]

Claim 52, Reference 4
Munger K, Hongell K, Aivo J, Soilu-Hanninen M, Surcel H-M, Ascherio A. 25-hydroxyvitamin D deficiency and risk of MS among women in the Finnish Maternity Cohort. Neurology 2017;89: 1578-83. [PubMed abstract]

Claim 52, Reference 5
Munger KL, Levin LI, Hollis BW, Howard NS, Ascherio A. Serum 25-hydroxyvitamin D levels and risk of multiple sclerosis. JAMA 2006;296:2832-8. [PubMed abstract]

Claim 52, Reference 6
Salzer J, Hallmans G, Nystrom M, Stenlund H. Wadell G, Sundstrom P. Vitamin D as a protective factor in multiple sclerosis. Neurology 2012;79:2140-5. [PubMed abstract]

CLAIM 53:

Vitamin E may reduce the risk of infections.

Claim 53, Reference 1
Traber MG. Vitamin E. In: Shils ME, Shike M, Ross AC, Caballero B, Cousins R, eds. Modern Nutrition in Health and Disease. 10th ed. Baltimore, MD: Lippincott Williams & Wilkins, 2006;396-411.

Claim 53, Reference 2
Institute of Medicine. Food and Nutrition Board. Dietary Reference Intakes: Vitamin C, Vitamin E, Selenium, and Carotenoids. Washington, DC: National Academy Press, 2000.

Claim 53, Reference 3
Kowdley KV, Mason JB, Meydani SN, Cornwall S, Grand RJ. Vitamin E deficiency and impaired cellular immunity related to intestinal fat malabsorption. Gastroenterology 1992;102:2139-42. [PubMed abstract]

CLAIM 54:

Vitamin E reduces the risk of cell adhesion and platelet aggregation, thereby reducing the risk of atherosclerosis.

Claim 54, Reference 1

Institute of Medicine. Food and Nutrition Board. Dietary Reference Intakes: Vitamin C, Vitamin E, Selenium, and Carotenoids. Washington, DC: National Academy Press, 2000.

Claim 54, Reference 2

Natural Medicines Database, Professional Vitamin E Monograph: https://naturalmedicines.therapeuticresearch.com/Data/ProMonographs/Vitamin-E

[*Monograph behind subscription wall*]

CLAIM 55:

Vitamin E can prevent loss of body control, muscle weakness and numbness in the arms and legs, and vision problems caused by vitamin E deficiency.

Claim 55, Reference 1
Traber MG. Vitamin E. In: Shils ME, Shike M, Ross AC, Caballero B, Cousins R, eds. Modern Nutrition in Health and Disease. 10th ed. Baltimore, MD: Lippincott Williams & Wilkins, 2006;396-411.

Claim 55, Reference 2
Brion LP, Bell EF, Raghuveer TS. Vitamin E supplementation for prevention of morbidity and mortality in preterm infants. Cochrane Database Syst Rev;4:CD003665. [PubMed abstract]

Claim 55, Reference 3
Cavalier L, Ouahchi K, Kayden H, Donato S, Reutenaucer L, Mandel JL, et al. Ataxia with isolated vitamin E deficiency: heterogeneity of mutations and phenotypic variability in a large number of families. Am J Hum Genet 1998;62:301-10. [PubMed abstract]

Claim 55, Reference 4
Age-Related Eye Disease Study Research Group. A randomized, placebo-controlled, clinical trial of high-dose supplementation with vitamins C and E, beta carotene, and zinc for age-related macular degeneration and vision loss: AREDS report no. 8. Arch Ophthalmol 2001;119:1417-36. [PubMed abstract]

Claim 55, Reference 5
The Age-Related Eye Disease Study 2 (AREDS2) Research Group. Lutein + zeaxanthin and omega-3 fatty acids for age-related macular degeneration: the Age-Related Eye Disease Study 2 (AREDS2) randomized clinical trial. JAMA 2013;309:2005-15. [PubMed abstract]

CLAIM 56:

Adequate iodine during pregnancy reduces the risk of abnormal bone and brain development in fetuses.

CLAIM 57:

Iodine intake by pregnant women reduces the risk of stunted growth, intellectual disabilities and delayed sexual development of fetuses.

Claims 56-57, Reference 1
National Research Council, Committee to Assess the Health Implications of Perchlorate Ingestion. Health Implications of Perchlorate Ingestion. Washington, DC: The National Academies Press, 2005.

Claims 56-57, Reference 2
Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc. Washington, DC: National Academy Press, 2001.

Claims 55-57, Reference 3
Santiago-Fernandez P, Torres-Barahona R, Muela-Martínez JA, Rojo-Martínez G, García-Fuentes E, Garriga MJ, León AG, Soriguer F. Intelligence quotient and iodine intake: a cross-sectional study in children. J Clin Endocrinol Metab. 2004 Aug;89(8):3851-3857. [PubMed abstract]

Claims 56-57, Reference 4
Levie D, Korevaar TIM, Bath SC, Murcia M, Dineva M, Llop S, Espada M, van Herwaarden AE, de Rijke YB, Ibarluzea JM, Sunyer J, Tiemeier H, Rayman MP, Guxens M, Peeters RP. Association of maternal iodine status with child IQ: A meta-analysis of individual participant data. J Clin Endocrinol Metab 2019;104:5957-67. [PubMed abstract]

Claims 56-57, Reference 5
Vermiglio F, Lo Presti VP, Moleti M, Sidoti M, Tortorella G, Scaffidi G, Castagna MG, Mattina

F, Violi MA, Crisà A, Artemisia A, Trimarchi F. Attention deficit and hyperactivity disorders in the offspring of mothers exposed to mild-moderate iodine deficiency: a possible novel iodine deficiency disorder in developed countries. J Clin Endocrinol Metab. 2004 Dec;89(12):6054-6060. [PubMed abstract]

Claims 56-57, Reference 6

Melse-Boonstra A, Jaiswal N. Iodine deficiency in pregnancy, infancy and childhood and its consequences for brain development. Best Pract Res Clin Endocrinol Metab. 2010 Feb;24(1):29-38. [PubMed abstract]

Claims 56-57, Reference 7

Zimmermann MB. Iodine deficiency in pregnancy and the effects of maternal iodine supplementation on the offspring: a review. Am J Clin Nutr. 2009 Feb;89(2):668S-672S. [PubMed abstract]

CLAIM 58:

Iodine intake in mildly iodine deficient children may reduce the risk of reasoning disabilities and abnormal cognitive function.

Claim 58, Reference 1
Melse-Boonstra A, Jaiswal N. Iodine deficiency in pregnancy, infancy and childhood and its consequences for brain development. Best Pract Res Clin Endocrinol Metab. 2010 Feb;24(1):29-38. [PubMed abstract]

Claim 58, Reference 2
Zimmermann MB. Iodine deficiency in pregnancy and the effects of maternal iodine supplementation on the offspring: a review. Am J Clin Nutr. 2009 Feb;89(2):668S-672S. [PubMed abstract]

Claim 58, Reference 3
Angermayr L, Clar C. Iodine supplementation for preventing iodine deficiency disorders in children. Cochrane Database Syst Rev. 2004;(2):CD003819. [PubMed abstract]

Claim 58, Reference 4
Gordon RC, Rose MC, Skeaff SA, Gray AR, Morgan KM, Ruffman T. Iodine supplementation improves cognition in mildly iodine-deficient children. Am J Clin Nutr. 2009 Nov;90(5):1264-1271. [PubMed abstract]

CLAIM 59:

Iron intake during pregnancy reduces the risk of abnormal fetal growth and development.

CLAIM 60:

Iron intake by pregnant women may reduce the risk of low fetal birth weight or premature fetal birth.

Claims 59-60, Reference 1
Wessling-Resnick M. Iron. In: Ross AC, Caballero B, Cousins RJ, Tucker KL, Ziegler RG, eds. Modern Nutrition in Health and Disease. 11th ed. Baltimore, MD: Lippincott Williams & Wilkins; 2014:176-88.

Claims 59-60, Reference 2
Aggett PJ. Iron. In: Erdman JW, Macdonald IA, Zeisel SH, eds. Present Knowledge in Nutrition. 10th ed. Washington, DC: Wiley-Blackwell; 2012:506-20.

Claims 59-60, Reference 3
Murray-Kolbe LE, Beard J. Iron. In: Coates PM, Betz JM, Blackman MR, et al., eds. Encyclopedia of Dietary Supplements. 2nd ed. London and New York: Informa Healthcare; 2010:432-8.

Claims 59-60, Reference 4
Mills RJ, Davies MW. Enteral iron supplementation in preterm and low birth weight infants. Cochrane Database Syst Rev 2012;3:CD005095. [PubMed abstract]

CLAIM 61:

Vitamin K1 supplementation reduces the risk of excessive bruising or bleeding.

Claim 61, Reference 1
Institute of Medicine. Dietary reference intakes for vitamin A, vitamin K, arsenic, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium, and zinc. Washington, DC: National Academy Press; 2001.

Claim 61, Reference 2
Suttie JW. Vitamin K. In: Coates PM, Betz JM, Blackman MR, et al., eds. Encyclopedia of Dietary Supplements. 2nd ed. London and New York: Informa Healthcare; 2010:851-60.

Claim 61, Reference 3
Suttie JW. Vitamin K. In: Ross AC, Caballero B, Cousins RJ, Tucker KL, Ziegler TR, eds. Modern Nutrition in Health and Disease. 11th ed. Baltimore, MD: Lippincott Williams & Wilkins; 2014:305-16.

Claim 61, Reference 4
Jagannath VA, Fedorowicz Z, Thaker V, Chang AB. Vitamin K supplementation for cystic fibrosis. The Cochrane database of systematic reviews 2013;4:CD008482. [PubMed abstract]

CLAIM 62:

Vitamin K2 may reduce the risk of osteoporosis.

Claim 62, Reference 1
Jagannath VA, Fedorowicz Z, Thaker V, Chang AB. Vitamin K supplementation for cystic fibrosis. The Cochrane database of systematic reviews 2013;4:CD008482. [PubMed abstract]

Claim 62, Reference 2
Gundberg CM, Lian JB, Booth SL. Vitamin K-dependent carboxylation of osteocalcin: friend or foe? Adv Nutr 2012;3:149-57. [PubMed abstract]

Claim 62, Reference 3
Yaegashi Y, Onoda T, Tanno K, Kuribayashi T, Sakata K, Orimo H. Association of hip fracture incidence and intake of calcium, magnesium, vitamin D, and vitamin K. Eur J Epidemiol 2008;23:219-25. [PubMed abstract]

Claim 62, Reference 4
Rejnmark L, Vestergaard P, Charles P, Hermann AP, Brot C, Eiken P, et al. No effect of vitamin K1 intake on bone mineral density and fracture risk in perimenopausal women. Osteoporos Int 2006;17:1122-32. [PubMed abstract]

Claim 62, Reference 5
Feskanich D, Weber P, Willett WC, Rockett H, Booth SL, Colditz GA. Vitamin K intake and hip fractures in women: a prospective study. Am J Clin Nutr 1999;69:74-9. [PubMed abstract]

Claim 62, Reference 6
Booth SL, Broe KE, Gagnon DR, Tucker KL, Hannan MT, McLean RR, et al. Vitamin K intake and bone mineral density in women and men. Am J Clin Nutr 2003;77:512-6. [PubMed abstract]

Claim 62, Reference 7
Booth SL, Tucker KL, Chen H, Hannan MT, Gagnon DR, Cupples LA, et al. Dietary vitamin K intakes are associated with hip fracture but not with bone mineral density in elderly men and women. Am J Clin Nutr 2000;71:1201-8. [PubMed abstract]

Claim 62, Reference 8

Chan R, Leung J, Woo J. No association between dietary vitamin K intake and fracture risk in chinese community-dwelling older men and women: a prospective study. Calcif Tissue Int 2012;90:396-403. [PubMed abstract]

CLAIM 63:

Magnesium may help reduce the risk of type 2 diabetes.

CLAIM 64:

Magnesium may help reduce the risk of insulin resistance.

Claims 63-64, Reference 1
Rude RK. Magnesium. In: Ross AC, Caballero B, Cousins RJ, Tucker KL, Ziegler TR, eds. Modern Nutrition in Health and Disease. 11th ed. Baltimore, Mass: Lippincott Williams & Wilkins; 2012:159-75.

Claims 63-64, Reference 2
Larsson SC, Wolk A. Magnesium intake and risk of type 2 diabetes: a meta-analysis. J Intern Med 2007;262:208-14. [PubMed abstract]

Claims 63-64, Reference 3
Rodriguez-Moran M, Simental Mendia LE, Zambrano Galvan G, Guerrero-Romero F. The role of magnesium in type 2 diabetes: a brief based-clinical review. Magnes Res 2011;24:156-62. [PubMed abstract]

Claims 63-64, Reference 4
Simmons D, Joshi S, Shaw J. Hypomagnesaemia is associated with diabetes: not pre-diabetes, obesity or the metabolic syndrome. Diabetes Res Clin Pract 2010;87:261-6. [PubMed abstract]

Claims 63-64, Reference 5
Schulze MB, Schulz M, Heidemann C, Schienkiewitz A, Hoffmann K, Boeing H. Fiber and magnesium intake and incidence of type 2 diabetes: a prospective study and meta-analysis. Arch Intern Med 2007;167:956–65. [PubMed abstract]

CLAIM 65:

Magnesium may reduce the risk of bone fractures.

CLAIM 66:

Magnesium may reduce the risk of osteoporosis.

CLAIM 67:

Magnesium may reduce the risk of bone mineral density loss in post-menopausal women.

Claims 65-67, Reference 1
Institute of Medicine (IOM). Food and Nutrition Board. Dietary Reference Intakes: Calcium, Phosphorus, Magnesium, Vitamin D and Fluoride. Washington, DC: National Academy Press, 1997.

Claims 65-67, Reference 2
Rude RK. Magnesium. In: Ross AC, Caballero B, Cousins RJ, Tucker KL, Ziegler TR, eds. Modern Nutrition in Health and Disease. 11th ed. Baltimore, Mass: Lippincott Williams & Wilkins; 2012:159-75.

Claims 65-67, Reference 3
Rude RK, Singer FR, Gruber HE. Skeletal and hormonal effects of magnesium deficiency. J Am Coll Nutr 2009;28:131–41. [PubMed abstract]

Claims 65-67, Reference 4

Tucker KL. Osteoporosis prevention and nutrition. Curr Osteoporos Rep 2009;7:111-7. [PubMed abstract]

Claims 65-67, Reference 5

Mutlu M, Argun M, Kilic E, Saraymen R, Yazar S. Magnesium, zinc and copper status in osteoporotic, osteopenic and normal post-menopausal women. J Int Med Res 2007;35:692-5. [PubMed abstract]

Claims 65-67, Reference 6

Aydin H, Deyneli O, Yavuz D, Gözü H, Mutlu N, Kaygusuz I, Akalin S. Short-term oral magnesium supplementation suppresses bone turnover in postmenopausal osteoporotic women. Biol Trace Elem Res 2010;133:136-43. [PubMed abstract]

CLAIM 68:

Magnesium may reduce the risk of migraine headaches.

Claim 68, Reference 1

Sun-Edelstein C, Mauskop A. Role of magnesium in the pathogenesis and treatment of migraine. Expert Rev Neurother 2009;9:369–79 [PubMed abstract]

Claim 68, Reference 2

Schürks M, Diener H-C, Goadsby P. Update on the prophylaxis of migraine. Cur Treat Options Neurol 2008;10:20–9. [PubMed abstract]

Claim 68, Reference 3

Holland S, Silberstein SD, Freitag F, Dodick DW, Argoff C, Ashman E. Evidence-based guideline update: NSAIDs and other complementary treatments for episodic migraine prevention in adults. Neurology 2012;78:1346-53. [PubMed abstract]

CLAIM 69:

Magnesium may help reduce the risk of heart arrythmia.

Claim 69, Reference 1

Institute of Medicine (IOM). Food and Nutrition Board. Dietary Reference Intakes: Calcium, Phosphorus, Magnesium, Vitamin D and Fluoride. Washington, DC: National Academy Press, 1997.

Claim 69, Reference 2

Rude RK. Magnesium. In: Coates PM, Betz JM, Blackman MR, Cragg GM, Levine M, Moss J, White JD, eds. Encyclopedia of Dietary Supplements. 2nd ed. New York, NY: Informa Healthcare; 2010:527-37.

Claim 69, Reference 3

Rude RK. Magnesium. In: Ross AC, Caballero B, Cousins RJ, Tucker KL, Ziegler TR, eds. Modern Nutrition in Health and Disease. 11th ed. Baltimore, Mass: Lippincott Williams & Wilkins; 2012:159-75.

CLAIM 70:

Magnesium may reduce the risk of cardiovascular disease.

Claim 70, Reference 1

Peacock JM, Ohira T, Post W, Sotoodehnia N, Rosamond W, Folsom AR. Serum magnesium and risk of sudden cardiac death in the Atherosclerosis Risk in Communities (ARIC) study. Am Heart J 2010;160:464-70. [PubMed abstract]

Claim 70, Reference 2

Dickinson HO, Nicolson D, Campbell F, Cook JV, Beyer FR, Ford GA, Mason J. Magnesium supplementation for the management of primary hypertension in adults. Cochrane Database of Systematic Reviews 2006: CD004640. [PubMed abstract]

Claim 70, Reference 3

Kass L, Weekes J, Carpenter L. Effect of magnesium supplementation on blood pressure: a meta-analysis. Eur J Clin Nutr 2012;66:411-8. [PubMed abstract]

Claim 70, Reference 4

Champagne CM. Dietary interventions on blood pressure: the Dietary Approaches to Stop Hypertension (DASH) trials. Nutr Rev 2006;64:S53-6. [PubMed abstract]

CLAIM 71:

Manganese may reduce the risk of osteoporosis.

Claim 71, Reference 1
Reginster JY, Strause LG, Saltman P, Franchimont P. Trace elements and postmenopausal osteoporosis: a preliminary study of decreased serum manganese. Med Sci Res 1988;16:337-8.

Claim 71, Reference 2
Zofkova I, Nemcikova P, Matucha P. Trace elements and bone health. Clin Chem Lab Med 2013;51:1555-61. [PubMed abstract]

Claim 71, Reference 3
Odabasi E, Turan M, Aydin A, Akay C, Kutlu M. Magnesium, zinc, copper, manganese, and selenium levels in postmenopausal women with osteoporosis. Can magnesium play a key role in osteoporosis? Ann Acad Med Singapore 2008;37:564-7. PMID: 18695768 [PubMed abstract]

Claim 71, Reference 4
Wang L, Yu H, Yang G, Zhang Y, Wang W, Su T, et al. Correlation between bone mineral density and serum trace element contents of elderly males in Beijing urban area. Int J Clin Exp Med 2015;8:19250-7. [PubMed abstract]

CLAIM 72:

Manganese may reduce the risk of blood clots.

Claim 72, Reference 1

Aschner JL, Aschner M. Nutritional aspects of manganese homeostasis. Mol Aspects Med 2005;26:353-62. [PubMed abstract]

CLAIM 73:

Molybdenum may reduce the risk of toxicity posed by drugs and toxic substances in the body.

Claim 73, Reference 1
Beedham C. Molybdenum hydroxylases as drug-metabolizing enzymes. Drug Metab Rev 1985;16:119-56. [PubMed abstract]

Claim 73, Reference 2
Terao M; Romão MJ, Leimkühler S, et al. Structure and function of mammalian aldehyde oxidases. Arch Toxicol 2016;90:753-80. [PubMed abstract]

Claim 73, Reference 3
Wahl B, Reichmann D, Niks D, et al. Biochemical and spectroscopic characterization of the human mitochondrial amidoxime reducing components hmARC-1 and hmARC-2 suggests the existence of a new molybdenum enzyme family in eukaryotes. J Biol Chem 2010;285:37847-59. [PubMed abstract]

Claim 73, Reference 4
Ott G, Havemeyer A, Clement B. The mammalian molybdenum enzymes of mARC. J Biol Inorg Chem 2015;20:265-75. [PubMed abstract]

CLAIM 74:

The combination of vitamin C (500 mg/day), Vitamin E (400 IU/day), zinc (80 mg/day), Copper (2 mg a day), lutein (10 mg/day) and zeaxanthin (2 mg/day) may reduce the risk of age-related macular degeneration (AMD).

Claim 74, Reference 1
Age-Related Eye Disease Study Research Group. A randomized, placebo-controlled, clinical trial of high-dose supplementation with vitamins C and E, beta carotene, and zinc for age-related macular degeneration and vision loss: AREDS report no. 8. Arch Ophthalmol 2001;119:1417-36. [PubMed abstract]

Claim 74, Reference 2
NEI (National Eye Institute). AREDS/AREDS2 clinical trials. 2020.

Claim 74, Reference 3
Age-Related Eye Disease Study 2 Research Group. Lutein + zeaxanthin and omega-3 fatty acids for age-related macular degeneration: the Age-Related Eye Disease Study 2 (AREDS2) randomized clinical trial. JAMA. 2013;309:2005-15. [PubMed abstract]

CLAIM 75:

Potassium may reduce the risk of high blood pressure (hypertension), coronary heart disease and stroke.

Claim 75, Reference 1
Stone MS, Martyn L, Weaver CM. Potassium intake, bioavailability, hypertension, and glucose control. Nutrients 2016;8. [PubMed abstract]

Claim 75, Reference 2
Weaver CM. Potassium and health. Adv Nutr 2013;4:368S-77S. [PubMed abstract]

CLAIM 76:

Increasing the daily intake of potassium while keeping sodium intake within the range of 4 to 6 grams daily may reduce the risk of hypertension and stroke.

Claim 76, Reference 1
Champagne CM. Dietary interventions on blood pressure: the Dietary Approaches to Stop Hypertension (DASH) trials. Nutr Rev 2006;64:S53-6. [PubMed abstract]

Claim 76, Reference 2
Filippini T, Violi F, D'Amico R, Vinceti M. The effect of potassium supplementation on blood pressure in hypertensive subjects: A systematic review and meta-analysis. Int J Cardiol 2017;230:127-35. [PubMed abstract]

Claim 76, Reference 3
Binia A, Jaeger J, Hu Y, Singh A, Zimmermann D. Daily potassium intake and sodium-to-potassium ratio in the reduction of blood pressure: a meta-analysis of randomized controlled trials. J Hypertens 2015;33:1509-20. [PubMed abstract]

CLAIM 77:

Potassium supplementation may reduce the risk of kidney stones.

Claim 77, Reference 1

Phillips R, Hanchanale VS, Myatt A, Somani B, Nabi G, Biyani CS. Citrate salts for preventing and treating calcium containing kidney stones in adults. Cochrane Database Syst Rev 2015:CD010057. [PubMed abstract]

Claim 77, Reference 2

Curhan GC, Willett WC, Rimm EB, Stampfer MJ. A prospective study of dietary calcium and other nutrients and the risk of symptomatic kidney stones. N Engl J Med 1993;328:833-8. [PubMed abstract]

Claim 77, Reference 3

Curhan GC, Willett WC, Speizer FE, Spiegelman D, Stampfer MJ. Comparison of dietary calcium with supplemental calcium and other nutrients as factors affecting the risk for kidney stones in women. Ann Intern Med 1997;126:497-504. [PubMed abstract]

Claim 77, Reference 4

Barcelo P, Wuhl O, Servitge E, Rousaud A, Pak CY. Randomized double-blind study of potassium citrate in idiopathic hypocitraturic calcium nephrolithiasis. J Urol 1993;150:1761-4. [PubMed abstract]

Claim 77, Reference 5

Maalouf NM, Moe OW, Adams-Huet B, Sakhaee K. Hypercalciuria associated with high dietary protein intake is not due to acid load. J Clin Endocrinol Metab 2011;96:3733-40. [PubMed abstract]

CLAIM 78:

Potassium supplementation may reduce the risk of osteoporosis.

Claim 78, Reference 1
Jehle S, Hulter HN, Krapf R. Effect of potassium citrate on bone density, microarchitecture, and fracture risk in healthy older adults without osteoporosis: a randomized controlled trial. J Clin Endocrinol Metab 2013;98:207-17. [PubMed abstract]

Claim 78, Reference 2
Dawson-Hughes B, Harris SS, Palermo NJ, Gilhooly CH, Shea MK, Fielding RA, et al. Potassium bicarbonate supplementation lowers bone turnover and calcium excretion in older men and women: A randomized dose-finding trial. J Bone Miner Res 2015;30:2103-11. [PubMed abstract]

Claim 78, Reference 3
Macdonald HM, Black AJ, Aucott L, Duthie G, Duthie S, Sandison R, et al. Effect of potassium citrate supplementation or increased fruit and vegetable intake on bone metabolism in healthy postmenopausal women: a randomized controlled trial. Am J Clin Nutr 2008;88:465-74. [PubMed abstract]

CLAIM 79:

Zinc may reduce the risk of pathogenic bacteria and viruses.

Claim 79, Reference 1
Reider CA, Chung RY, Devarshi PP, Grant RW, Hazels Mitmesser S. Inadequacy of immune health nutrients: intakes in US adults, the 2005-2016 NHANES. Nutrients 2020;12. [PubMed abstract]

Claim 79, Reference 2
Roohani N, Hurrell R, Kelishadi R, Schulin R. Zinc and its importance for human health: An integrative review. J Res Med Sci 2013;18:144-57. [PubMed abstract]

Claim 79, Reference 3
King JC, Cousins RJ. Zinc. In: Ross AC, Caballero B, Cousins RJ, Tucker KL, Ziegler TR, eds. Modern Nutrition in Health and Disease. 11th ed. Baltimore, MD: Lippincott Williams & Wilkins; 2014:189-205.

Claim 79, Reference 4
Hunter J, Arentz S, Goldenberg J, Yang G, Beardsley J, Myers SP, et al. Zinc for the prevention or treatment of acute viral respiratory tract infections in adults: a rapid systematic review and meta-analysis of randomised controlled trials. BMJ Open 2021;11:e047474. [PubMed abstract]

CLAIM 80:

Zinc may reduce the length of wound healing.

Claim 80, Reference 1
Momen-Heravi M, Barahimi E, Razzaghi R, Bahmani F, Gilasi HR, Asemi Z. The effects of zinc supplementation on wound healing and metabolic status in patients with diabetic foot ulcer: A randomized, double-blind, placebo-controlled trial. Wound Repair Regen 2017;25:512-20. [PubMed abstract]

Claim 80, Reference 2
Moore ZE, Corcoran MA, Patton D. Nutritional interventions for treating foot ulcers in people with diabetes. Cochrane Database Syst Rev 2020;7:Cd011378. [PubMed abstract]

CLAIM 81:

Zinc may reduce the duration of the common cold.

Claim 81, Reference 1
Hemilä H. Zinc lozenges may shorten the duration of colds: a systematic review. Open Respir Med J 2011;5:51-8. [PubMed abstract]

Claim 81, Reference 2
Science M, Johnstone J, Roth DE, Guyatt G, Loeb M. Zinc for the treatment of the common cold: a systematic review and meta-analysis of randomized controlled trials. Cmaj 2012;184:E551-61. [PubMed abstract]

CLAIM 82:

Zinc may reduce the risk of pneumonia.

Claim 82, Reference 1
Walker CLF, Rudan I, Liu L, Nair H, Theodoratou E, Bhutta ZA, et al. Global burden of childhood pneumonia and diarrhoea. Lancet 2013;381:1405-16. [PubMed abstract]

Claim 82, Reference 2
Brown N, Kukka AJ, Mårtensson A. Efficacy of zinc as adjunctive pneumonia treatment in children aged 2 to 60 months in low-income and middle-income countries: a systematic review and meta-analysis. BMJ Paediatr Open 2020;4:e000662. [PubMed abstract]

Claim 82, Reference 3
Wang L, Song Y. Efficacy of zinc given as an adjunct to the treatment of severe pneumonia: A meta-analysis of randomized, double-blind and placebo-controlled trials. Clin Respir J 2018;12:857-64. [PubMed abstract]

CLAIM 83:

Zinc may reduce the risk of type 2 diabetes.

Claim 83, Reference 1
Fernandez-Cao JC, Warthon-Medina M, V HM, Arija V, Doepking C, Serra-Majem L, et al. Zinc intake and status and risk of type 2 diabetes mellitus: a systematic review and meta-analysis. Nutrients 2019;11. [PubMed abstract]

Claim 83, Reference 2
El Dib R, Gameiro OL, Ogata MS, Modolo NS, Braz LG, Jorge EC, et al. Zinc supplementation for the prevention of type 2 diabetes mellitus in adults with insulin resistance. Cochrane Database Syst Rev 2015:Cd005525. [PubMed abstract]

Claim 83, Reference 3
Asbaghi O, Sadeghian M, Fouladvand F, Panahande B, Nasiri M, Khodadost M, et al. Effects of zinc supplementation on lipid profile in patients with type 2 diabetes mellitus: A systematic review and meta-analysis of randomized controlled trials. Nutr Metab Cardiovasc Dis 2020;30:1260-71. [PubMed abstract]

Claim 83, Reference 4
Pompano LM, Boy E. Effects of dose and duration of zinc interventions on risk factors for type 2 diabetes and cardiovascular disease: a systematic review and meta-analysis. Adv Nutr 2021;12:141-60. [PubMed abstract]

Claim 83, Reference 5
Wang X, Wu W, Zheng W, Fang X, Chen L, Rink L, et al. Zinc supplementation improves glycemic control for diabetes prevention and management: a systematic review and meta-analysis of randomized controlled trials. Am J Clin Nutr 2019;110:76-90. [PubMed abstract]

Claim 83, Reference 6
Li X, Zhao J. The influence of zinc supplementation on metabolic status in gestational diabetes: a meta-analysis of randomized controlled studies. J Matern Fetal Neonatal Med 2021;34:2140-5. [PubMed abstract]

Claim 83, Reference 7
Momen-Heravi M, Barahimi E, Razzaghi R, Bahmani F, Gilasi HR, Asemi Z. The effects of zinc supplementation on wound healing and metabolic status in patients with diabetic foot ulcer: A randomized, double-blind, placebo-controlled trial. Wound Repair Regen 2017;25:512-20. [PubMed abstract]

Claim 83, Reference 8

Moore ZE, Corcoran MA, Patton D. Nutritional interventions for treating foot ulcers in people with diabetes. Cochrane Database Syst Rev 2020;7:Cd011378. [PubMed abstract]

CLAIM 84:

Zinc may reduce the risk of hypercholesterolemia.

Claim 84, Reference 1

Asbaghi O, Sadeghian M, Fouladvand F, Panahande B, Nasiri M, Khodadost M, et al. Effects of zinc supplementation on lipid profile in patients with type 2 diabetes mellitus: A systematic review and meta-analysis of randomized controlled trials. Nutr Metab Cardiovasc Dis 2020;30:1260-71. [PubMed abstract]

CLAIM 85:

Zinc may reduce the frequency of infections.

Claim 85, Reference 1
Roohani N, Hurrell R, Kelishadi R, Schulin R. Zinc and its importance for human health: An integrative review. J Res Med Sci 2013;18:144-57. [PubMed abstract]

Claim 85, Reference 2
King JC, Cousins RJ. Zinc. In: Ross AC, Caballero B, Cousins RJ, Tucker KL, Ziegler TR, eds. Modern Nutrition in Health and Disease. 11th ed. Baltimore, MD: Lippincott Williams & Wilkins; 2014:189-205.

Claim 85, Reference 3
Hunter J, Arentz S, Goldenberg J, Yang G, Beardsley J, Myers SP, et al. Zinc for the prevention or treatment of acute viral respiratory tract infections in adults: a rapid systematic review and meta-analysis of randomised controlled trials. BMJ Open 2021;11:e047474. [PubMed abstract]

CLAIM 86:

Pantothenic acid may reduce the risk of hyperlipidemia (abnormally high levels of lipids [fats] such as cholesterol or triglycerides in the blood)

Claim 86, Reference 1

Rumberger JA, Napolitano J, Azumano I, et al. Pantethine, a derivative of vitamin B(5) used as a nutritional supplement, favorably alters low-density lipoprotein cholesterol metabolism in low- to moderate-cardiovascular risk North American subjects: a triple-blinded placebo and diet-controlled investigation. Nutr Res 2011;31:608-15. [PubMed abstract]

CLAIM 87: Selenium may reduce the risk of oxidative damage from infections.

CLAIM 88: Selenium may reduce the risk of hypothyroidism (low thyroid activity).

Claims 87-88, Reference 1
Gladyshev VN, Arnér ES, Berry MJ, Brigelius-Flohé R, Bruford EA, et al. Selenoprotein Gene Nomenclature. J Biol Chem 2016;291:24036-40. [PubMed abstract]

Claims 87-88, Reference 2
Sunde RA. Selenium. In: Ross AC, Caballero B, Cousins RJ, Tucker KL, Ziegler TR, eds. Modern Nutrition in Health and Disease. 11th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2014:225-37.

Claims 87-88, Reference 3
Hong LK, Diamond AM. Selenium. In: Marriott BP, Birt DF, Stallings VA, Yates AA, eds. Present Knowledge in Nutrition. 11th ed. Cambridge, MA: Academic Press; 2020:443-56.

Claims 87-88, Reference 4
Lei XG, Rayman M, Sunde RA. Selenium. In: Tucker KL, Ross CA, Jensen GL, Torger-Decker R, Duggan CP, eds. Modern Nutrition in Health and Disease. 12th ed. Burlington, MA: Jones & Bartlett Learning. In press. 2024.

CLAIM 89:

Selenium may reduce the risk of cognitive decline.

Claim 89, Reference 1
Akbaraly TN, Hininger-Favier I, Carrière I, Arnaud J, Gourlet V, et al. Plasma selenium over time and cognitive decline in the elderly. Epidemiology 2007;18:52-8. [PubMed abstract]

Claim 89, Reference 2
Berr C, Balansard B, Arnaud J, Roussel AM, Alpérovitch A. Cognitive decline is associated with systemic oxidative stress: the EVA study. Etude du Vieillissement Artériel. J Am Geriatr Soc 2000;48:1285-91. [PubMed abstract]

Claim 89, Reference 3
Gao S, Jin Y, Hall KS, Liang C, Unverzagt FW, et al. Selenium level and cognitive function in rural elderly Chinese. Am J Epidemiol 2007;165:955-65. [PubMed abstract]

Claim 89, Reference 4
Kesse-Guyot E, Fezeu L, Jeandel C, Ferry M, Andreeva V, et al. French adults' cognitive performance after daily supplementation with antioxidant vitamins and minerals at nutritional doses: a post hoc analysis of the Supplementation in Vitamins and Mineral Antioxidants (SU.VI.MAX) trial. Am J Clin Nutr 2011;94:892-9. [PubMed abstract]

Claim 89, Reference 5
de Wilde MC, Vellas B, Girault E, Yavuz AC, Sijben JW. Lower brain and blood nutrient status in Alzheimer's disease: Results from meta-analyses. Alzheimers Dement (N Y) 2017;3:416-31. [PubMed abstract]

Claim 89, Reference 6
Reddy VS, Bukke S, Dutt N, Rana P, Pandey AK. A systematic review and meta-analysis of the circulatory, erythrocellular and CSF selenium levels in Alzheimer's disease: A metal meta-analysis (AMMA study-I). J Trace Elem Med Biol 2017;42:68-75. [PubMed abstract]

Claim 89, Reference 7
Kryscio RJ, Abner EL, Caban-Holt A, Lovell M, Goodman P, et al. Association of Antioxidant Supplement Use and Dementia in the Prevention of Alzheimer's Disease by Vitamin E and Selenium Trial (PREADViSE). JAMA Neurol 2017;74:567-73. [PubMed abstract]

Claim 89, Reference 8
Pereira ME, Souza JV, Galiciolli MEA, Sare F, Vieira GS, et al. Effects of Selenium Supplementation in Patients with Mild Cognitive Impairment or Alzheimer's Disease: A Systematic Review and Meta-Analysis. Nutrients 2022;14:3205. [PubMed abstract]

CLAIM 90:

Selenium may reduce the risk of Keshan Disease.

Claim 90, Reference 1
Hong LK, Diamond AM. Selenium. In: Marriott BP, Birt DF, Stallings VA, Yates AA, eds. Present Knowledge in Nutrition. 11th ed. Cambridge, MA: Academic Press; 2020:443-56.

Claim 90, Reference 2
Institute of Medicine. Food and Nutrition Board. Dietary Reference Intakes: Vitamin C, Vitamin E, Selenium, and Carotenoids. Washington, DC: National Academy Press; 2000. [PubMed abstract]

Claim 90, Reference 3
Chen J. An original discovery: selenium deficiency and Keshan disease (an endemic heart disease). Asia Pac J Clin Nutr 2012;21:320-6. [PubMed abstract]

Claim 90, Reference 4
Zhou H, Wang T, Li Q, Li D. Prevention of Keshan Disease by Selenium Supplementation: a Systematic Review and Meta-analysis. Biol Trace Elem Res 2018;186:98-105. [PubMed abstract]

CLAIM 91:

Selenium may reduce the risk of cardiovascular disease by reducing inflammation, platelet aggregation, and lipid oxidation.

Claim 91, Reference 1
Lei XG, Rayman M, Sunde RA. Selenium. In: Tucker KL, Ross CA, Jensen GL, Torger-Decker R, Duggan CP, eds. Modern Nutrition in Health and Disease. 12th ed. Burlington, MA: Jones & Bartlett Learning. In press. 2024.

Claim 91, Reference 2
Vinceti M, Filippini T, Cilloni S, Crespi CM. The Epidemiology of Selenium and Human Cancer. Adv Cancer Res 2017;136:1-48. [PubMed abstract]

Claim 91, Reference 3
Cold F, Winther KH, Pastor-Barriuso R, Rayman MP, Guallar E, et al. Randomised controlled trial of the effect of long-term selenium supplementation on plasma cholesterol in an elderly Danish population. Br J Nutr 2015;114:1807-18. [PubMed abstract]

Claim 91, Reference 4
Rees K, Hartley L, Day C, Flowers N, Clarke A, et al. Selenium supplementation for the primary prevention of cardiovascular disease. Cochrane Database Syst Rev 2013;2013:Cd009671. [PubMed abstract]

Claim 91, Reference 5
Flores-Mateo G, Navas-Acien A, Pastor-Barriuso R, Guallar E. Selenium and coronary heart disease: a meta-analysis. Am J Clin Nutr 2006;84:762-73. [PubMed abstract]

CLAIM 92:

Asian ginseng may help reduce the risk of excessive blood cholesterol levels.

Claim 92, Reference 1
Naseri K, Saadati S, Sadeghi A, et al. The efficacy of ginseng (Panax) on human prediabetes and type 2 diabetes mellitus: a systematic review and meta-analysis. *Nutrients*. 2022;14(12):2401.

CLAIM 93:

Asian ginseng may reduce the risk of chronic inflammation in the body.

Claim 93, Reference 1
He M, Huang X, Shuying L, et al. The difference between white and red ginseng: variations in ginsenosides and immunomodulation. *Planta Medica.* 2018;84(12-13):845-854.

CLAIM 94:

Asian ginseng may reduce the risk of erectile dysfunction (ED).

Claim 94, Reference 1
Shin D, Yoon BI, Bang S, et al. Safety and efficacy assessment of red ginseng oil (RXGIN) in men with lower urinary tract symptoms in a randomized, double-blind, placebo-controlled trial. *The World Journal of Men's Health*. 2024;42(1):229-236.

CLAIM 95:

Ashwagandha may reduce insomnia.

Claim 95, Reference 1
Langade D, Thakare V, Kanchi S, Kelgane S. Clinical evaluation of the pharmacological impact of ashwagandha root extract on sleep in healthy volunteers and insomnia patients: A double-blind, randomized, parallel-group, placebo-controlled study. J Ethnopharmacol 2021;264:113276. [PubMed abstract]

CLAIM 96:

Astragalus may reduce the risk of lower respiratory infections.

Claim 96, Reference 1
Zhang X, Qu X, Zou Y. The effect of astragalus on humoral and cellular immune response: a systematic review and meta-analysis of human studies. *Complementary Medicine Research*. 2023;30(6):535-543.

CLAIM 97:

Preliminary research suggests that bromelain may reduce the risk of sinus congestion.

Claim 97, Reference 1
Griffin AS, Cabot P, Wallwork B, et al. Alternative therapies for chronic rhinosinusitis: a review. *Ear, Nose & Throat Journal*. 2018;97(3):E25-E33.

Claim 97, Reference 2
Gupta AA, Kambala R, Bhola N, et al. Comparative efficacy of bromelain and aceclofenac in limiting post-operative inflammatory sequelae in surgical removal of lower impacted third molar: a randomized controlled, triple blind clinical trial. *Journal of Dental Anesthesia and Pain Medicine.* 2022;22(1):29-37.

Claim 97, Reference 3
Leelakanok N, Petchsomrit A, Janurai T, et al. Efficacy and safety of bromelain: a systematic review and meta-analysis. *Nutrition and Health.* 2023;29(3):479-503.

Claim 97, Reference 4
Liu S, Zhao H, Wang Y, et al. Oral bromelain for the control of facial swelling, trismus, and pain after mandibular third molar surgery: a systematic review and meta-analysis. *Journal of Oral and Maxillofacial Surgery.* 2019;77(8):1566-1574.

Claim 97, Reference 5
Mendes M-L-T, do Nascimento-Júnior E-M, Reinheimer D-M, et al. Efficacy of proteolytic enzyme bromelain on health outcomes after third molar surgery. Systematic review and meta-analysis of randomized clinical trials. *Medicina oral, patologia oral y cirugia bucal.* 2019;24(1):e61-e69.

CLAIM 98:

Chamomile may reduce the risk of mild depression.

Claim 98, Reference 1
Amsterdam JD, Li QS, Xie SX, et al. Putative antidepressant effect of chamomile (*Matricaria chamomilla* L.) oral extract in subjects with comorbid generalized anxiety disorder and depression. *Journal of Alternative and Complementary Medicine*. 2020;26(9):813-819.

Claim 98, Reference 2
Hieu TH, Dibas M, Surya Dila KA, et al. Therapeutic efficacy and safety of chamomile for state anxiety, generalized anxiety disorder, insomnia, and sleep quality: a systematic review and meta-analysis of randomized trials and quasi-randomized trials. *Phytotherapy Research*. 2019;33(6):1604-1615.

CLAIM 99:

Chamomile may reduce the risk of diarrhea in children and colic in infants.

Claim 99, Reference 1
Chamomile. Drugs and Lactation Database (LactMed). National Institute of Child Health and Human Development. Updated February 2021.
Accessed ncbi.nlm.nih.gov/books/NBK501808 on February 13, 2024.

Claim 99, Reference 2
Dai Y-L, Li Y, Wang Q, et al. Chamomile: a review of its traditional uses, chemical constituents, pharmacological activities and quality control studies. *Molecules*. 2022;28(1):133.

CLAIM 100:

Cranberry extracts may reduce the risk of repeat urinary tract infections (UTIs) in women.

Claim 100, Reference 1
American Urological Association. Recurrent Uncomplicated Urinary Tract Infections in Women: AUA/CUA/SUFU Guideline (2022). Accessed at auanet.org/guidelines-and-quality/guidelines/recurrent-utiLink to External Link Policy on September 20, 2023.

Claim 100, Reference 2
Caljouw MAA, van den Hout WB, Putter H, et al. Effectiveness of cranberry capsules to prevent urinary tract infections in vulnerable older persons: a double-blind randomized placebo-controlled trial in long-term care facilities. *Journal of the American Geriatrics Society.* 2014;62(1):103-110.

Claim 100, Reference 3
Gbinigie O, Allen J, Williams N, et al. Does cranberry extract reduce antibiotic use for symptoms of acute uncomplicated urinary tract infections (CUTI)? A feasibility randomised trial. *BMJ Open.* 2021;11(2):e046791.

Claim 100, Reference 4
Williams G, Hahn D, Stephens JH, et al. Cranberries for preventing urinary tract infections (review). *Cochrane Database of Systematic Reviews.* 2023;4(4):CD001321. Accessed at cochranelibrary.comLink to External Link Policy on September 1, 2023.

CLAIM 101:

Elderberry may reduce the risk of colds, flu, and other upper respiratory infections.

Claim 101, Reference 1
Adams KK, Baker WL, Sobieraj DM. Myth busters: dietary supplements and COVID-19. *Annals of Pharmacotherapy.* 2020;54(8):820-826.

Claim 101, Reference 2
Asgary S, Pouramini A. The pros and cons of using elderberry *(Sambucus nigra)* for prevention and treatment of COVID-19. *Advanced Biomedical Research*. 2022;11:96.

Claim 101, Reference 3
Harnett J, Oakes K, Carè J, et al. The effects of *Sambucus nigra* berry on acute respiratory viral infections: a rapid review of clinical studies. *Advances in Integrative Medicine*. 2020;7(4):240-246.

Claim 101, Reference 4
Hawkins J, Baker C, Cherry L, et al. Black elderberry *(Sambucus nigra)* supplementation effectively treats upper respiratory symptoms: a meta-analysis of randomized, controlled clinical trials. *Complementary Therapies in Medicine.* 2019;42:361-365.

Claim 101, Reference 5
Saifulazmi NF, Rohani ER, Harun S, et al. A review with updated perspectives on the antiviral potentials of traditional medicinal plants and their prospects in antiviral therapy. *Life (Basel)*. 2022;12(8):1287.

CLAIM 102:

Flaxseed oil supplements containing alpha-linolenic acid (ALA) may help reduce the risk of insulin resistance.

Claim 102, Reference 1
Bongartz U, Hochmann U, Grube B, et al. Flaxseed mucilage (IQP-LU-104) reduces body weight in overweight and moderately obese individuals in a 12-week, three-arm, double-blind, randomized, and placebo-controlled clinical study. *Obesity Facts.* 2022;15(3):395-404.

Claim 102, Reference 2
Jamilian M, Tabassi Z, Reiner Z, et al. The effects of n-3 fatty acids from flaxseed oil on genetic and metabolic profiles in patients with gestational diabetes mellitus: a randomised, double-blind, placebo-controlled trial. *British Journal of Nutrition.* 2020;123(7):792-799.

CLAIM 103:

Garlic supplements may reduce total and LDL ('bad') cholesterol in people with high cholesterol levels.

Claim 103, Reference 1
Ried K, Toben C, Fakler P. Effect of garlic on serum lipids: an updated meta-analysis. *Nutrition Reviews.* 2013;71(5):282-299.

Claim 103, Reference 2
Shabani E, Sayemiri K, Mohammadpour M. The effect of garlic on lipid profile and glucose parameters in diabetic patients: a systematic review and meta-analysis. *Primary Care Diabetes.* 2019;13(1):28-42.

Claim 103, Reference 3
Sun Y-E, Wang W, Qin J. Anti-hyperlipidemia of garlic by reducing the level of total cholesterol and low-density lipoprotein: a meta-analysis. *Medicine (Baltimore).* 2018;97(18):e0255.

CLAIM 104:

Ginger may reduce the risk of nausea and vomiting associated with pregnancy.

Claim 104, Reference 1
Choi J, Lee J, Kim K, et al. Effects of ginger intake on chemotherapy-induced nausea and vomiting: a systematic review of randomized clinical trials. *Nutrients.* 2022;14(23):4982.

Claim 104, Reference 2
Hu Y, Amoah AA, Zhang H, et al. Effect of ginger in the treatment of nausea and vomiting compared with vitamin B6 and placebo during pregnancy: a meta-analysis. *Journal of Maternal-Fetal & Neonatal Medicine.* 2022;35(1):187-196.

Claim 104, Reference 3
Nassif MS, Costa ICP, Ribeiro PM, et al. Integrative and complementary practices to control nausea and vomiting in pregnant women: a systematic review. *Revista da Escola de Enfermagen da USP.* 2022;56:e20210515.

CLAIM 105:

Ginkgo Biloba may help reduce the risk of dementia.

Claim 105, Reference 1
Cave AE, Chang DH, Münch GW, et al. A systematic review of the safety and efficacy on cognitive function of herbal and nutritional medicines in older adults with and without subjective cognitive impairment. *Systematic Reviews.* 2023;12(1):143.

Claim 105, Reference 2
Crawford C, Boyd C, Deuster PA. Dietary supplement ingredients for optimizing cognitive performance among healthy adults: a systematic review. *Journal of Alternative and Complementary Medicine.* 2021;27(11):940-958.

Claim 105, Reference 3
DeKosky ST, Williamson JD, Fitzpatrick AL, et al. *Ginkgo biloba* for prevention of dementia: a randomized controlled trial. *JAMA*. 2008;300(19):2253-2262.

Claim 105, Reference 4
Liao Z, Cheng L, Li X, et al. Meta-analysis of *Ginkgo biloba* preparation for the treatment of Alzheimer's disease. *Clinical Neuropharmacology.* 2020;43(4):93-99.

CLAIM 106:

Grape seed and skin-derived antioxidants may reduce the risk of heart disease.

Claim 106, Reference 1
Foshati S, Nouripour F, Sadeghi E, et al. The effect of grape *(Vitis vinifera)* seed extract supplementation on flow-mediated dilation, blood pressure, and heart rate: a systematic review and meta-analysis of controlled trials with duration- and dose-response analysis. *Pharmacological Research.* 2022;175:105905.

Claim 106, Reference 2
Anjom-Shoae J, Milajerdi A, Larijani B, et al. Effects of grape seed extract on dyslipidaemia: a systematic review and dose-response meta-analysis of randomised controlled trials. *British Journal of Nutrition.* 2020;124(2):121-134.

CLAIM 107:

Proanthocyanidin-rich grape seed extracts may reduce the risk of chronic venous insufficiency (CVI).

No supporting references cited.

CLAIM 108:

Green coffee bean extracts may lower blood sugar levels.

Claim 108, Reference 1
Onakpoya I, Terry R, Ernst E. The use of green coffee extract as a weight loss supplement: a systematic review and meta-analysis of randomised clinical trials. Gastroenterol Res Pract. 2011;2011:382852.

CLAIM 109:

Green tea may lower total and LDL ('bad') cholesterol.

Claim 109, Reference 1
Deka A, Vita JA. Tea and cardiovascular disease. *Pharmacological Research*. 2011;64(2):136-145.

Claim 109, Reference 2
Wang Z-M, Zhao D, Wang H, et al. Green tea consumption and the risk of coronary heart disease: a systematic review and meta-analysis of cohort studies. *Nutrition, Metabolism, and Cardiovascular Diseases: NMCD*. 2023;33(4):715-723.

Claim 109, Reference 3
Xu R, Yang K, Li S, et al. Effect of green tea consumption on blood lipids: a systematic review and meta-analysis of randomized controlled trials. *Nutrition Journal.* 2020;19(1):48.

Claim 109, Reference 4
Yang X, Dai H, Deng R, et al. Association between tea consumption and prevention of coronary artery disease: a systematic review and dose-response meta-analysis. *Frontiers in Nutrition.* 2022;9:1021405.

CLAIM 110:

Lavender (*Lavandula angustifolia*) oil taken orally may reduce sexual dysfunction in menopausal and post-menopausal women.

Claim 110, Reference 1
Haramshahi M, Babaie S, Shahnazi M, et al. The efficacy of oral *Lavandula angustifolia* Mill. essential oil on menopausal symptoms, serum lipid profile, and cortisol concentration in postmenopausal women: a triple-blind, randomized, controlled trial. *Complementary Therapies in Medicine.* 2024;82:103050.

Claim 110, Reference 2
Lucena L, Santos-Junior JG, Tufik S, et al. Effect of a lavender essential oil and sleep hygiene protocol on insomnia in postmenopausal women: a pilot randomized clinical trial. *Explore (NY).* 2024;20(1):116-125.

CLAIM 111

Peppermint (*Mentha × piperita*) leaves (or oil) may help reduce the risk of irritable bowel syndrome (IBS).

Claim 111, Reference 1
Chumpitazi BP, Kearns GL, Shulman RJ. Review article: the physiological effects and safety of peppermint oil and its efficacy in irritable bowel syndrome and other functional disorders. *Alimentary Pharmacology & Therapeutics*. 2018;47(6):738-752.

Claim 111, Reference 2
Ingrosso MR, Ianiro G, Nee J, et al. Systematic review and meta-analysis: efficacy of peppermint oil in irritable bowel syndrome. *Alimentary Pharmacology & Therapeutics*. 2022;56(6):932-941.

Claim 111, Reference 3
Lacy BE, Pimentel M, Brenner DM, et al. ACG clinical guideline: management of irritable bowel syndrome. *American Journal of Gastroenterology*. 2021;116(1):17-44.

Claim 111, Reference 4
Scarpellini E, Broeders B, Schol J, et al. The use of peppermint oil in gastroenterology. *Current Pharmaceutical Design*. 2023;29(8):576-583.

CLAIM 112:

Turmeric (*Curcuma longa*) extracts may reduce the risk of osteoarthritis.

Claim 112, Reference 1
Feng J, Li Z, Tian L, et al. Efficacy and safety of curcuminoids alone in alleviating pain and dysfunction for knee osteoarthritis: a systematic review and meta-analysis of randomized controlled trials. *BMC Complementary Medicine and Therapies*. 2022;22(1):276.

Claim 112, Reference 2
Hidayat R, Parlindungan F, Nisa JI, et al. Efficacy of *Curcuma longa* in relieving pain symptoms of knee osteoarthritis patients: a systematic review and meta-analysis of clinical trials. *Journal of Rheumatic Diseases*. 2025;32(1):17-29.

Claim 112, Reference 3
Hsiao A-F, Lien Y-C, Tzeng I-S, et al. The efficacy of high- and low-dose curcumin in knee osteoarthritis: a systematic review and meta-analysis. *Complementary Therapies in Medicine*. 2021;63:102775.

CLAIM 113:

Omega-3 fatty acids rich in EPA and DHA may reduce inflammation.

Claim 113, Reference 1
Fritsche KL. Too much linoleic acid promotes inflammation-doesn't it? Prostaglandins Leukot Essent Fatty Acids 2008;79:173-5.

Claim 113, Reference 2
James M, Proudman S, Cleland L. Fish oil and rheumatoid arthritis: past, present and future. Proc Nutr Soc 2010;69:316-23

CLAIM 114:

Omega-3 fatty acids may reduce the risk of cancer.

Claim 114, Reference 1
Harris WS, Davidson MH. RE: Plasma phospholipid fatty acids and prostate cancer risk in the SELECT trial. J Natl Cancer Inst 2014;106:dju019. [PubMed abstract]

Claim 114, Reference 2
Gabbs M, Leng S, Devassy JG, Monirujjaman M, Aukema HM. Advances in our understanding of oxylipins derived from dietary PUFAs. Adv Nutr 2015;6:513-40

CLAIM 115:

Fiber may help lower blood glucose and insulin levels after eating carbohydrates.

No supporting references cited.

CLAIM 116:

Fiber may lower fasting blood glucose levels.

No supporting references cited.

CLAIM 117:

Fiber may reduce the risk of high blood pressure (hypertension)

No supporting references cited.

CLAIM 118:

Fiber may reduce the risk of chronic constipation.

No supporting references cited.