A Clinician’s Guide to Dietary Supplement Regulation

Anatomy of a Supplement

What Is a Dietary Supplement

According to the Office of Dietary Supplements at the National Institutes of Health, a dietary supplement is a product that supplements the diet and may contain the following:

- Vitamins
- Minerals
- Herbs or botanicals
- Amino acids
- “Other ingredients” (i.e., animal glandular material)

“Products largely rooted in the food supply but employed beyond the purpose of sustenance.”

https://ods.od.nih.gov/factsheets/WYNTK-Consumer/
Swann JP. The history of efforts to regulate dietary supplements in the USA. *Drug Test Anal.* 2016;8(3-4):271-282. doi:10.1002/dta.1919.

What Is a Dietary Supplement

Can contain the following:

- Vitamins
- Minerals
- Herbs or botanicals
- Amino acids
- Other dietary substances used to supplement the diet
- Any extract, part, concentrate, or metabolite of these origins

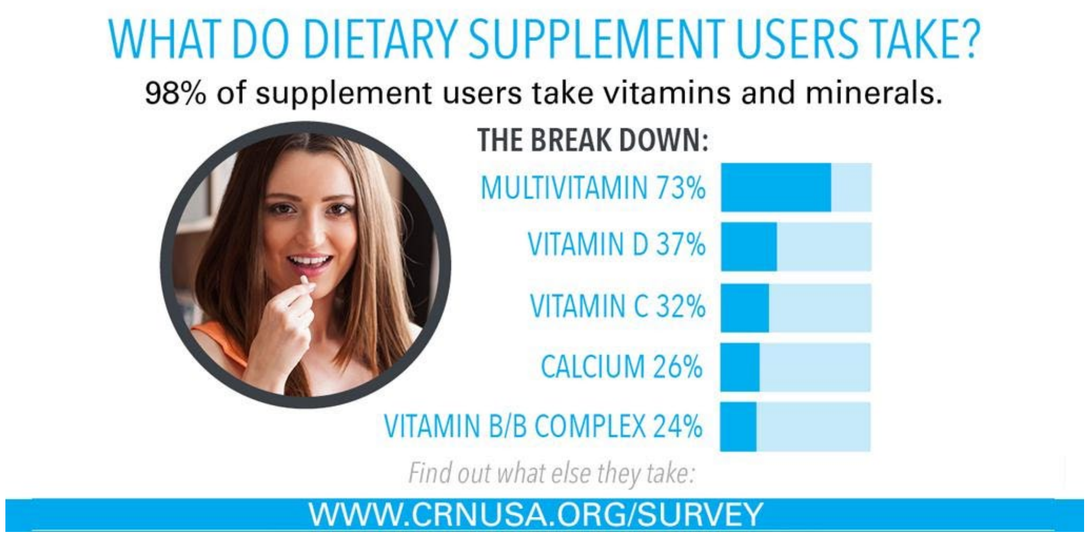
Can be in any ingestible form but must be ingested/swallowed:

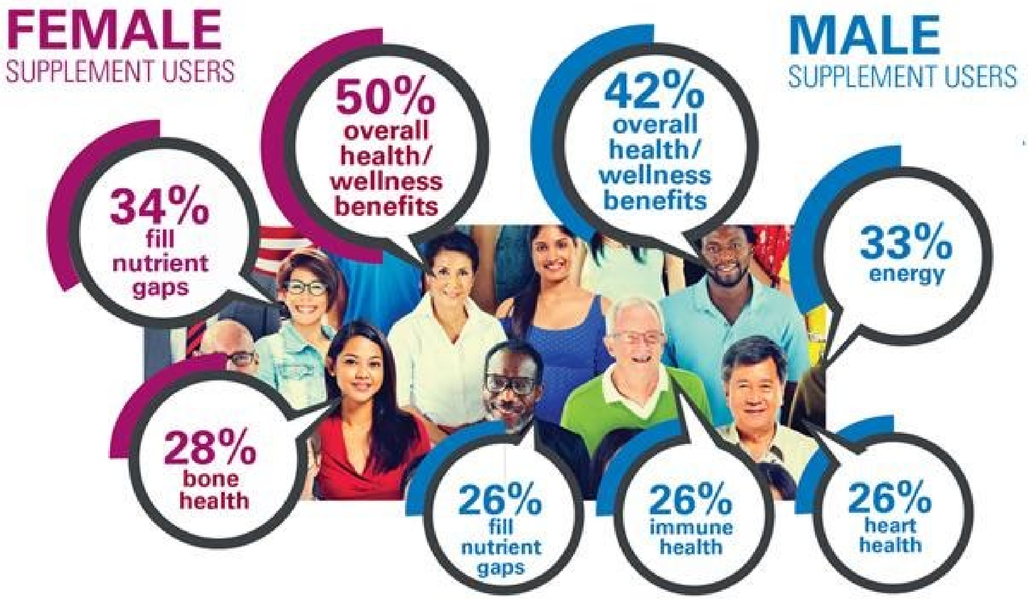
- Tablet, capsule, powder, liquid, all okay
- Sublingual = NO, not ingested but absorbed through oral mucosa
- Injection/IV = NO, even if origin aligns with a dietary supplement ingredient, such as glutathione since not ingested
- Inhaled = NO, if nebulized, inhaled, etc., it is considered a drug, even if ingredient aligns with dietary supplement origin
- Topical/transdermal = NO

https://ods.od.nih.gov/About/DSHEA_Wording.aspx

About Dietary Supplements

76% of Americans use dietary supplements (2017), up from 64% in 2007.





CRN 2017 Consumer Survey on Dietary Supplements. https://www.crnusa.org/survey

What Are Consumers Using?

Specialty 49%

- OMEGA-3/FATTY ACIDS 21%
- PROBIOTICS 16%
- FIBER 14%
- MELATONIN 10%
- GLUCOSAMINE/CHONDROITIN 9%

Herbals/Botanicals 39%

- GREEN TEA 14%
- CRANBERRY 9%
- TURMERIC 9%
- GARLIC 8%
- GINSENG 8%
- GINKGO BILOBA 6%
- MILK THISTLE 5%
- ECHINACEA 5%

Sports Nutrition 29%

- PROTEIN (POWDERS, DRINKS, BARS) 19%
- ENERGY DRINKS AND/OR GELS 12%
- HYDRATION DRINKS OR GELS 8%
- CREATINE 6%
- AMINO ACIDS 6%
- RECOVERY DRINKS AND/OR POWDERS 5%

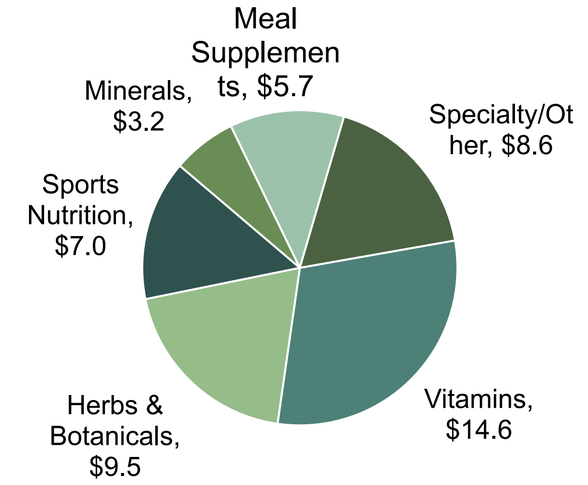
Weight Management 19%

- PROTEIN (POWDERS, DRINKS, BARS) 10%
- GARCINIA CAMBOGIA 5%
- GREEN COFFEE 4%
- MEDIUM CHAIN TRIGLYCERIDE OIL 2%
- WHITE KIDNEY BEAN 2%
- BITTER ORANGE (SYNEPHRINE) 2%
- GLUCOMANNAN 2%
- CLA 1%

Source: Council for Responsible Nutrition (CRN) | More information: www.crnusa.org/survey

U.S. Dietary Supplement Market (NBJ)

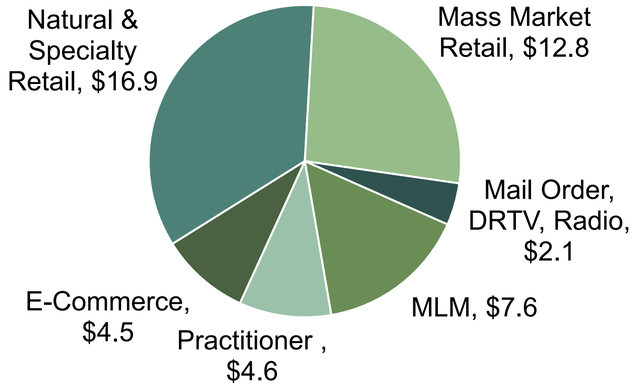
2019 Sales by Category



Compound Annual Growth:	2015-2019	2019-2023E
Vitamins	4.5%	7.4%
Herbs / Botanicals	8.3%	7.7%
Sports Supplements	7.5%	5.2%
Minerals	3.7%	4.4%
Meal Supplements	6.0%	6.5%
Specialty / Other	4.7%	5.4%
Total	**5.8%**	**6.5%**

2019 Sales by Channel

Total Market 2019: $49 Billion



Compound Annual Growth:	2015-2019	2019-2023E
Natural & Specialty Retail	4.3%	2.5%
Mass Market Retail	5.1%	4.2%
Mail Order, DRTV, Radio	2.7%	2.0%
MLM/Network Marketing	5.3%	3.5%
Practitioner	***7.9%***	***6.7%***
E-Commerce	16.0%	25.7%
Total	**5.8%**	**6.5%**

Sales at Retail/Consumer Prices; Source: EE Estimated NBJ forecast based on 2019 Supplement Report and current summary data

Why Regulation Matters to You

Ensure supplement quality and consistency:

- Clinicians should worry about getting the right diagnosis and selecting the right therapeutic, but should not also have to worry that products have in them what they say they do
  - Potency
  - Identity
  - Contaminants
  - Allergens
- Science-backed ingredients and formulas

How Do Dietary Supplement & Drug Regulations Differ?

	Premarket FDA Approval (safety, efficacy)	Premarket FDA Notification	cGMP	FDA-Registered Facility	Label Requirements	Post-Market Surveillance	FDA Audits	FTC & FDA Oversee Advertising
Food		✓	✓	✓	✓	✓	✓	✓
Dietary Supplements		✓		✓	✓	✓	✓	✓
Drugs	✓			✓	✓	✓	✓	✓

https://ods.od.nih.gov/About/DSHEA_Wording.aspx

How Do FDA/FTC Regulations Affect You?

- Generally, the FDA does NOT regulate medical practice
- Recommendations or statements made clinician-to-patient are not regulated
- There are scenarios where you will have FDA/FTC responsibility
  - Marketing supplements for sale to the public
  - Talking about specific supplements on social media, blogs, etc. (if you sell)
  - If you have your own private label, even if manufactured by another company
  - If you are blending/compounding in your own practice, such as custom herbal tinctures, the FDA technically has authority, but there has not been a prioritized area of enforcement to date

Supplements Have FDA Oversight

The FDA has regulatory oversight of dietary supplements:

- What ingredients are considered “dietary supplements”
- Establishing and enforcing good manufacturing practices (cGMP) that companies must follow
- Evaluating “new dietary ingredients”
- Monitoring recalls and serious adverse events

Cornerstones of Dietary Supplement Regulation

1. Manufacturing Standards
2. Labeling and Claims
3. Ingredient Safety
4. Adverse Event Reporting and Recall Procedures

How Did We Get Here?

A Brief History of Dietary Supplement Use and Regulation

History of Dietary Supplements

- 18th/19th Centuries: First connection between certain diseases and diet
  - Rickets, scurvy, beriberi, pellagra
- 1840s: German chemist Justus von Liebig publishes *Animal Chemistry*, dealing with early concepts of nutrition and metabolic uses of proteins, carbohydrates, and fats
- Early 1900s: Food's purpose was still thought of primarily with the three macros—energy, tissue development, and maintenance
  - William H. Wollaston isolates cysteine, Cambridge biochemist Frederick Gowland Hopkins isolates tryptophan, and scientists start to recognize food factors with biological impact

Swann JP. The history of efforts to regulate dietary supplements in the USA. *Drug Test Anal.* 2016;8(3-4):271-282. doi:10.1002/dta.1919.

History of Dietary Supplements

- 1912: Hopkins labels these “accessory food factors,” and Casimir Funk named these “vitamines”
- Early 1900s: more vitamins isolated (vitamins A, D, and C, biotin, and pantothenic acid) and rapidly enter mainstream commerce

Swann JP. The history of efforts to regulate dietary supplements in the USA. *Drug Test Anal.* 2016;8(3-4):271-282. doi:10.1002/dta.1919.
Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.

Meanwhile…

- Early 1900s brought rise of “miraculous” cures, including radium (1898), electrical medical devices, and desiccated thyroid for weight loss, but concern rose for consumers purchasing fraudulent or dangerous products
- Postal fraud laws and the Federal Trade Commission (FTC) arose to provide for prosecution of firms engaged in fraudulent advertising and unfair trade

Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.
Young JH. *The Medical Messiahs: A Social History of Health Quackery in Twentieth-Century America*. Princeton: Princeton University Press; 1967:66–67, 333-359, 368-369, 383.
Federal Trade Commission Act, Public Law 63-203, 38 US Stat. 717, 26 September 1914.

Origins of the FDA

- 1862: First chemist appointed to the Department of Agriculture, launching the Bureau of Chemistry
  - FTC & Post Office would consult with Bureau of Chemistry on scientific and medical matters
- 1906: After 25 years of negotiation, the Federal Food and Drugs Act was passed, charged with consumer protection
  - Prohibited interstate and foreign commerce in adulterated and misbranded food and drugs
  - Called for seizure and prosecution to enforce law
  - Drugs defined for first time as “substances used to cure, mitigate, or prevent disease”
  - Drugs had to abide by standards for quality, purity, and strength as described in the US Pharmacopeia (USP) or National Formulary (NF)

Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.
Sonnedecker G. *The Early Years of Federal Food and Drug Control, American Institute of the History of Pharmacy*. Madison; 1982: 34-36.

FDA & Dietary Supplements

- 1920s: FDA first investigated concerns around vitamins
- USP & NF did not contain guidance around vitamins until 1926 (when vitamin A was added)
  - Were label claims accurate?
  - Did products contain the amounts stated on label?
- 1922: FDA establishes first standards for vitamins (manufacture, labeling, and advertising)
- 1932: FDA opens first lab dedicated to study of vitamins

Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.
Sonnedecker G. *The Early Years of Federal Food and Drug Control, American Institute of the History of Pharmacy*. Madison; 1982: 34-36.
Chief, Central District to Chiefs of Stations, 16 February 1922, FDA History Office files.

FDA & Dietary Supplements

“. . . labeling of food products with claims implying that they possess curative, health-giving, healing qualities, when, as a matter of fact, they merely possess those wholesome, nutritive qualities which a food of that particular description should possess, is a misbranding within the meaning of the food and drugs act and subjects the product so labeled to the penalties imposed by that act. In like manner, extreme and unwarranted vitamin claims must be classed as illegal.”

—PB Dunbar, FDA, 1930

Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.
Sonnedecker G. *The Early Years of Federal Food and Drug Control, American Institute of the History of Pharmacy*. Madison; 1982: 34-36.

FDA & Dietary Supplements

FDA began actions against companies in the vitamin market:

- Garlic tablets marketed for diphtheria, tuberculosis, hypertension, and other diseases
- Commanders vitamins, for containing subpar potency and quality
- Case against Royal Lee's Catalyn (in 1933) for subpotent vitamin content and claims to treat over 50 ailments (other than deficiency syndromes) dragged out for over 10 years
- Many more!

Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.
Sonnedecker G. *The Early Years of Federal Food and Drug Control, American Institute of the History of Pharmacy*. Madison; 1982:34-36.
Notices of Judgment No. 24682. Available at: http://archive.nlm.nih.gov/fdanj/bitstream/123456789/64601/3/FDNJ24682.pdf [28 September 2015].
Omaha firm fined for false vitamin claims. *Food Drug Rev*. 1936;20:232.
Catalyn shipper assessed over $4,000 for prosecution costs. *Food Drug Rev*. 1939;23:45.
Notices of Judgment No. 30999. Available at: http://archive.nlm.nih.gov/fdanj/bitstream/123456789/68251/6/FDNJ21213.pdf [28 September 2015].

Food, Drug, and Cosmetic Act of 1938

- 1938: Food, Drug, and Cosmetic Act replaced the 1906 act
- Broadened scope of consumer products to be regulated by FDA and enhanced consumer protections
  - Cosmetics
  - Medical devices
- Drug pre-approval process developed
- Re-prioritized the claims on a product OVER the source/type of product to define a drug, meaning if there were treatment claims, it was a drug, even if it was nutritive in origin

Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.

Dietary Ingredients Defined as Food

- 1940: FDA issued proposed MDRs (minimum daily requirements), defined as amount of vitamins and minerals needed to prevent deficiency diseases
- Labels now required % MDR and directions for use
- Any additional substance (other than those with established MDRs) must then also offer a statement that the need for the substance has not been established
- Agency solidifies its stance that a vitamin is regulated as a food, not as a drug

Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.

The Nutrilite Decree of 1951

Nutrilite, a door-to-door vitamin company, was in a pivotal case with the FDA. They settled on a consent decree that had many components, but importantly, it…

- Allowed representations of function of a dietary ingredient only if it was grounded in generally accepted nutritional science (such as deficiencies) or if there was reliable scientific opinion behind them
- Specifically prohibited a lot of (disease) claims including arthritis, rheumatism, diabetes, cancer, and impotence, as well as several statements about health, science, and supplements
- Allowed testimonials as long as they complied with above guidance

Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.
Notices of Judgment, No. 3383 Available at: https://ceb.nlm.nih.gov/fdanj/bitstream/123456789/72344/3/FFNJ03381.pdf [28 October 2015] (quote from p. 373).

Supplements in the 1960s

- MDRs replaced with “daily requirements” based on recommended daily allowances (RDA) set by National Academy of Sciences
- June 1962: FDA proposed draft regulations that limited nutritional supplements to 12 ingredients (eight vitamin and four mineral)
- No other vitamins and minerals were determined to require supplementation

Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.

Supplements in the 1960s

- FDA received over 54,000 communications about these drafts and issued revisions in 1966
  - Five additional allowed nutrients
  - Required statement: “Vitamins and minerals are supplied in abundant amounts by the foods we eat. The Food and Nutrition Board of the National Research Council recommends that dietary needs be satisfied by foods. Except for persons with special medical needs, there is no scientific basis for recommending routine use of dietary supplements.”
- Administrative hearings over guidance continued until 1970
- Rise of mistrust in government (Watergate, thalidomide, DES, etc.) led to continued interest in supplements and holistic medicine

Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.

Debate on FDA's Role Continues

- 1970s: Proposal that any nutrient in amounts over 100% RDA will be regulated as an OTC drug
  - An aide to Sen. Edward Kennedy (who chaired the hearings on regulation) claimed the office received more mail about supplements than Watergate
- 1976: Passage of Vitamin-Mineral Amendments of 1976
  - Prohibited FDA from limiting potency of vitamins/minerals
  - Prevented reclassification as a drug
  - Prevented restriction on combining ingredients
  - FDA could still pursue false and misleading claims and reclassify as drugs any item making claims

Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.

The 90s

- The Nutrition Labeling and Education Act of 1990 (NLEA) charged the FDA with creating a more meaningful food label:
  - Establish definitions of “free,” “reduced,” ”light,” “high,” “low,” etc.
  - Herbs were mentioned in legislation for the first time
- FDA launches Dietary Supplements Task Force in 1991 to look at regulation with fresh eyes
  - cGMP
  - Strengthens adverse event reporting
  - Regulates of amino acid
  - Addresses herbal safety and regulation
- DSHEA (Dietary Supplement Health and Education Act) passed in 1994

Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.

Dietary Supplement Health & Education Act (DSHEA)

This is the regulatory structure we currently operate under:

- Defined dietary supplement, including vitamins, minerals, herbs, amino acids, or other substance taken to increase dietary intake
- Established cGMP

Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.

Dietary Supplement Health & Education Act (DSHEA)

- Burden to prove product is adulterated rests with the government
  - No premarket clearance required
- Defined how a supplement could be marketed
  - Structure/function language versus disease claims
- Started the clock with New Dietary Ingredients and process for review
  - Ingredients not on market prior to October 15, 1994
- Created Office of Dietary Supplement (ODS) within the NIH
- Created task force to clarify labeling requirements

Becker SL. In: Parascandola J, Whorton JC, eds. *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*. Washington, DC: American Chemical Society; 1983:61-83.

What Made Regulation Difficult?

- Originally described to be additions to the food supply, but in practice, they came to be more therapeutic in function
- Conflict between rising and thriving wave of public support with opposing business and political perspectives
- Science (or lack thereof) surrounding supplement ingredients
- Consumer interest and use outpaced science and regulation

Swann JP. The history of efforts to regulate dietary supplements in the USA. *Drug Test Anal.* 2016;8(3-4):271-282. doi:10.1002/dta.1919.

Dietary Supplement Manufacturing

A Behind-the-Scenes Look

Cornerstones of Dietary Supplement Regulation

1. Manufacturing Standards
2. Labeling and Claims
3. Ingredient Safety
4. Adverse Event Reporting and Recall Procedures

cGMPs

Current Good Manufacturing Practices:

- Lay out requirements for proper controls throughout the manufacturing process
- Require consistent purity, potency, identity, and composition
- Apply to all companies that manufacture, package, label, or hold dietary supplements

*Ingredient manufacturers are not currently held (by law) to cGMPs

Companies that do not comply (based on findings from FDA's observations at a facility audit) may be held to one or several enforcement actions:

- Warning Letter—companies must respond with a written corrective action plan
- Consent decree, seizure of product, injunctions if cGMP violations continue

Supplement Manufacturing Process

- Product Design & Research
- Ingredient Sourcing
- Ingredient Testing
- Blending
- Encapsulating/Tableting
- Finished-Product Testing
- Packaging
- Holding, Distributing, & Shipping

Product Design

- Typically based on clinical research, traditional use, or a combination of the two
- Involves clinical design
  - Desired active ingredients
  - Ingredient forms and dosages
  - Other parameters: allergen free, specific format, excipients allowed, etc.
- Good design enables a brand to make desired structural and functional claims

Request for Quote
****** Prenatal

From:
Jaclyn Chasse, ND
drjchasse@gmail.com

A bit about the product: This is an oral capsule product manufactured as part of our Prenatal kits formulated with top-level, bioavailable ingredients to serve as a foundational element of a high-quality, modern, prenatal package. This will serve a population including preconception, pregnancy, and postpartum women.

Dosage Form: Capsule (vegetable cellulose), size 00 or 0. No more than 3 capsules daily. 1-2 capsules preferred

Certifications required of the finished product (kosher, organic, etc): Gluten free, vegetarian, kosher. Product should be manufactured or labeled to meet Prop 65 requirements. Prefer soy free, dairy free, vegan.

Active Ingredients/Formula: (2 capsule)

1. Vitamin A (beta carotene) 750 mcg
2. Vitamin C (ascorbic acid) 100 mg
3. Vitamin D3 (cholecalciferol) 25 mcg (1,000 IU)
4. Vitamin E (mixed tocopherols & tocotrienols OR d-alpha tocopherol if mixed not available) 30 mg
5. Vitamin K1 (phytonadione) 60 mcg plus Vitamin K2 (menaquinone-7) 30 mcg
6. Thiamin (B1) (thiamine HCl) 5 mg
7. Riboflavin (B2) (riboflavin-5'-phosphate sodium) 5 mg
8. Niacin (niacinamide) 30 mg
9. Vitamin B6 (pyridoxal-5-phosphate sodium) 12 mg
10. Folate 800 mcg (400 mcg folinic acid + 400 mcg 5-MTHF)
11. Vitamin B12 (methylcobalamin) 100 mcg
12. Biotin 300 mcg (could decrease)
13. Pantothenic acid (d-calcium pantothenate) 10 mg
14. Choline 300 mg
15. Iron (from iron bisglycinate, like ferrochel) 18 mg
16. Iodine (potassium iodide) 150 mg
17. Zinc (bisglycinate chelate or equiavalent) 15 mg
18. Selenium (L-selenomethionine) 50 mcg
19. Copper (as bisglycinate chelate or equivalent) 1 mg
20. Manganese (as bisglycinate chelate or equivalent) 1 mg
21. Chromium (as nicotinate glycinate chelate or equivalent) 75 mcg
22. Molybdenum (amino acid chelate) 10 mcg
23. Boron (as amino acid chelate) 1mg

CONSIDER

24. Calcium (90 mg calcium citrate plus 90 mg calcium malate)
25. Magnesium

Acceptable Inactive Ingredients: Microcrystalline Cellulose, Hypromellose (derived from cellulose) capsule, Leucine, Silicon Dioxide.

**If product needs to be in a softgel due to any ingredients, we can discuss other inactives

Serving size 2 capsules
Servings per Bottle: 30

Container: TBD. Please price for bulk purchase to be packeted by 3rd party. If packeting is available (with 2-3 other stock ingredients) we'd like to discuss pricing.

Label: We will have initial label graphic design and copy, but would welcome any offered services for finalization of label (ensuring proper formatting, font, etc) and printing. Label specifics (Standard 4 color/UV coating/Paper v poly) TBD.

- Testing as required to allow label to state free of applicable allergens (gluten dairy) and kosher

Desired Quantity:
We desire an initial order volume of 150,000 capsules (assuming 2 capsule daily dosage), enough for 2,500 x 1-month supply. Please quote per your minimum order, and also provide an additional tiers listing if reduced costs at higher volumes.

Quality Testing:
We require that you provide all Identity and Micro testing as required by cGMPs.

- **Certificate of analyses for raw materials should be initially validated by conducting full confirmation testing on several subsequent receipts prior to qualifying a vendor, ie for potency. For contaminants, relevant testing must be completed on a skip-lot basis with suitable rationale.**
- We are interested in you supporting accelerated & real-time stability studies if you offer them.

Desired Timeline
- Final lot released by July 1, 2020

Ingredient Sourcing

- One of the most important steps to a quality product and estimated to be the largest risk in dietary supplement quality
- Involves qualification of suppliers through independent testing on a risk-based or every-lot cadence
- Ingredient market is not consistent, and ingredients ARE promoted that are poor quality
- This is a situation where “you get what you pay for”

Ingredient Sourcing

1. Find a new ingredient and supplier
2. Receive sample of ingredient with Certificate of Analysis (COA or CofA)
3. Test to validate the Certificate of Analysis
4. Order the ingredient in bulk
5. Test the bulk ingredient against COA
   - FDA requires proof of testing identity, potency, and microbial contamination on every lot
6. Once passed, ingredient is released from quarantine
7. Once a manufacturer goes through this process a number of times (3–5) with different lots, a brand may “qualify” the supplier and not test every new lot, instead testing on “skip lot” basis

What Makes a Good Quality Ingredient?

1. Consistency
2. Accurate Potency
3. No “Adulterants”
4. Clean of Contaminants
5. Bioavailable

Ingredient Testing

- One of the most important aspects of supplement quality
- Ensures ingredient meets specifications
  - Identity: ingredient is what it says it is
    - Including constituents that are noted on the label (or not)
  - Potency: strength matches what is expected
  - Microbial testing
  - Heavy metal testing
  - Solvent residue
  - Pesticides/herbicides
  - Melamine
  - Other

Blending

- Ingredients each measured, weight double checked, added to blender
- Cleaning procedures for surface and deep clean between lots

Image from https://www.dataninja.com/dietary-supplement/

Encapsulating

- Blended ingredients are input into a machine where the ingredients are flowed into capsules
- Flow agents/excipients are usually added to ensure efficiency
- Capsule weight checked every 5–10 min. in a run against specification

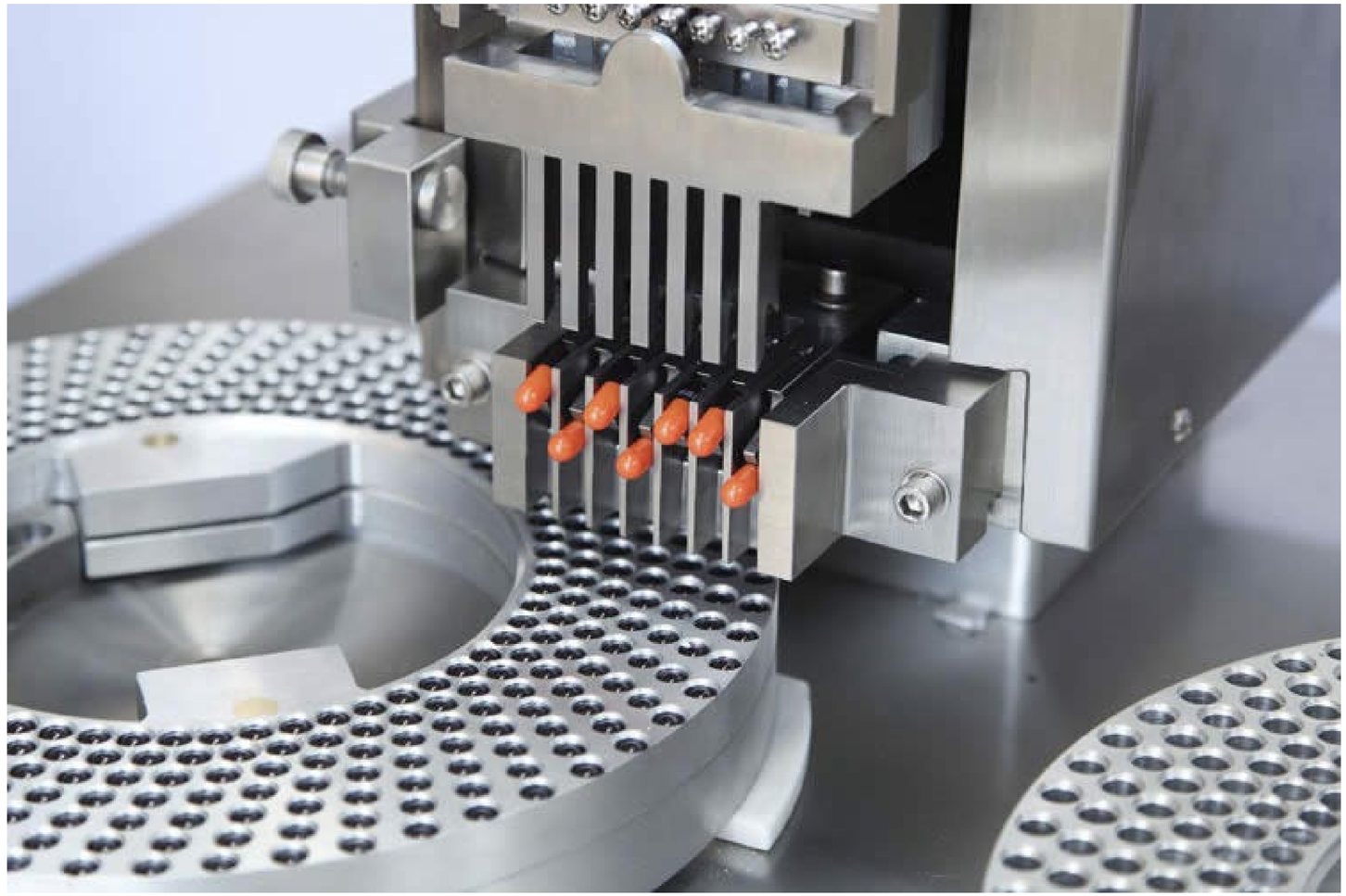


Image: www.beehivebotanicals.net

Tableting

- Ingredients are loaded into machine and pressed under high pressure into a tablet
- A separate machine will apply a coating, and then they will also be dried in a dryer

Capsules v. Tablets

- Some ingredients are easier to either tablet or encapsulate, but it’s mostly patient/practitioner preference
- Tablets must undergo dissolution testing to ensure they break down properly
- Excipient profiles may differ

Finished-Product Testing

Product is tested:

- Identity
- Potency
- Purity/contaminants
- Dissolution
- Stability

Packaging

- Bottling
- Label Design
- Labeling

Holding & Distributing

- Correct temperature and humidity for storage ensures quality through the expiration date
- Clean facilities
- Your correct order is shipped

The Dietary Supplement Label

Quality Insights

Principal Display Panel	Information Panel (*panel to the immediate right of PDP*)	Any label panel
• **Statement of Identity** (e.g., *herbal supplement* or *dietary supplement*) – MUST include the word "supplement" • **Net Quantity of Contents Declaration** (in numerical count (e.g., 30 capsules), or if in volume or weight, both in metric and U.S. Customary System terms)	• **Supplement Facts** • **Ingredients** • **Major Food Allergens** • **Name and Place of Business of Manufacturer, Packer, or Distributor** (if the listed company is not the manufacturer, you must include, e.g., "Distributed by" or "Manufactured for") ***Note:*** *There should be no intervening material appearing between the information above. For example, any UPC, logos, directions for use, and claims may not separate the above information, but may be placed after all of the above information.*	• **Full Domestic Street Address or Phone Number** for receiving adverse event reports • **Directions for Use** (voluntary, unless necessary for safe use) • **Warnings** (voluntary, unless necessary for safe use) • **Country of Origin** (voluntary, unless product is foreign-sourced) • **DSHEA Disclaimer** (voluntary, unless structure/function claims are made)

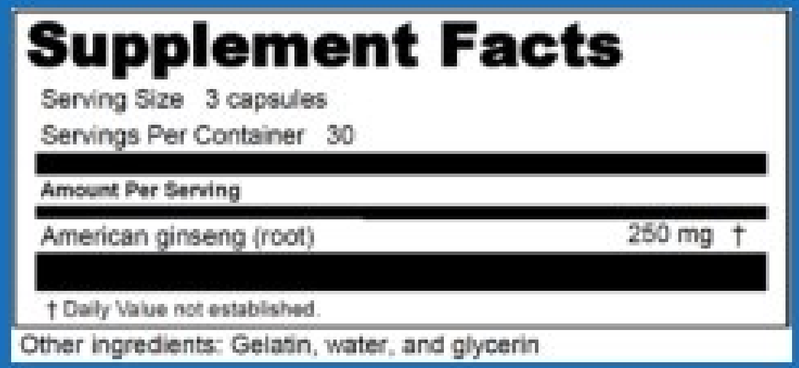
Dietary Supplement Label Template

Directions: Take 3 capsules twice a day.

[LOGO/PRODUCT NAME]

Herbal Supplement

90 capsules



Distributed by:
ABC Company, Inc.
Silver Spring, MD 20910
(301) 588-1171
Product of Canada

Dietary Supplement Label

1. **Supplement Facts is the name given to the nutrition information panel of a dietary supplement product.**
2. **Serving size is the manufacturer's suggested serving expressed in the appropriate unit (tablet, capsule, softgel, packet, teaspoonful, etc.)**
3. **Servings Per Container tells the net content of the dietary supplement.**
4. **Amount Per Serving heads the listing of dietary ingredients in the supplement and the quantity of each.**
5. **Percent Daily Value (DV) tells what percentage of the recommended daily intake for each nutrient is contained in each serving. The DVs are for adults and children ages 4 and up, unless otherwise indicated.**
6. **All dietary ingredients contained in the supplement are identified by their common or usual name. A dietary ingredient can be a vitamin, mineral, botanical, amino acid, or other dietary substance, as well as a concentrate, metabolite, constituent, extract, or combination of any of the above.**
7. **The amount of dietary ingredient in each serving is declared in metric units. Milligram (mg) and microgram (mcg) are common units.**
8. **A symbol, such as an asterisk, placed under the % Daily Value heading indicates that the Daily Value has not been established for that dietary ingredient.**
9. **A footnote contains explanations for symbols, such as the asterisk, placed under the % Daily Value heading. Explanations may include "Daily Value not established."**
10. **The list of all ingredients in the supplement, including any ingredient that is the source of a dietary ingredient, in decreasing order by weight.**

1 Supplement Facts

2 Serving Size 1 Tablet
Servings Per Container 100

3

	4 Amount Per Serving	5 % Daily Value
Vitamin A (50% as beta-carotene)	900 mcg	100%
6 Vitamin C	7 250 mg	278%
Vitamin D	20 mcg	100%
Vitamin E	75 mg	500%
Vitamin K	120 mcg	100%
Thiamin	1.2 mg	100%
Riboflavin	1.3 mg	100%
Niacin	16 mg	100%
Vitamin B6	1.7 mg	100%
Folate	400 mcg DFE (240 mcg folic acid)	100%
Vitamin B12	2.4 mcg	100%
Biotin	30 mcg	100%
Pantothenic Acid	5 mg	100%
Choline	550 mg	100%
Calcium	260 mg	20%
Iron	18 mg	100%
Phosphorus	250 mg	20%
Iodine	150 mcg	100%
Magnesium	210 mg	50%
Zinc	11 mg	100%
Selenium	25 mcg	45%
Copper	0.9 mg	100%
Boron	150 mcg	8 *

9 * Daily Value not established.

10 Other Ingredients: Choline bitartrate, calcium carbonate, ascorbic acid, dicalcium phosphate, magnesium oxide, microcrystalline cellulose, dl-alpha tocopherol acetate, ferrous fumarate, niacinamide, zinc oxide, magnesium stearate, d-calcium pantothenate, vitamin A acetate, pyridoxine hydrochloride, potassium iodide, boron citrate, phylloquinone, thiamin mononitrate, copper sulfate, d-biotin, sodium selenate, cholecalciferol, and cyanocobalamin.

Image: Counsel for Responsible Nutrition

Dietary Supplement Label

Supplement Facts

Serving size 1 capsule
Servings per container 180

	Amount Per Serving	%DV
Pantothenic acid (as calcium pantothenate) (B_5)	150 mg	3,000%
Asian ginseng (*Panax ginseng*) extract (root) (standardized to contain 5% total ginsenosides)	150 mg	*
Eleuthero (*Eleutherococcus senticosus*) extract (root) (standardized to contain 0.8% eleutherosides)	100 mg	*
Ashwagandha (*Withania somnifera*) extract (root) (standardized to contain 2.5% withanolides)	150 mg	*
Rhodiola (*Rhodiola rosea*) extract (root) (standardized to contain 3% total rosavins and 1% salidroside)	50 mg	*
Astragalus (*Astragalus membranaceus*) extract (root)	150 mg	*

*Daily value (DV) not established

Other ingredients: vegetarian capsule (cellulose, water)

‡This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

Proprietary Blends

Do they provide enough info for you?

Supplement Facts

Serving Size 1 Tablet

Amount per Serving			% DV
FoodState Nutrients			
Vitamin A ....(45 mg†; carrot)	2250	IU	45
As Alpha & Beta Carotene with Mixed Carotenoids (Cryptoxanthin, Lutein, Zeaxanthin)			
Vitamin C ..... (240 mg†; organic orange)	60	mg	100
Vitamin D3 ..... (8 mg†; *S. cerevisiae*)	400	IU	100
Vitamin E* ..(64 mg†; organic brown rice)	16	IU	53
Vitamin K .....(3 mg†; cabbage)	30	mcg	38
Thiamine (B-1)..... (12 mg†; *S. cerevisiae*)	3	mg	200
Riboflavin (B-2) ... (20 mg†; *S. cerevisiae*)	2	mg	118
Niacinamide..... (80 mg†; *S. cerevisiae*)	20	mg	100
Vitamin B-6..... (20 mg†; *S. cerevisiae*)	4	mg	200
Folate ..... (40 mg†; broccoli)	400	mcg	100
Vitamin B-12 ..... (2 mg†; *S. cerevisiae*)	10	mcg	167
Biotin ..... (21 mg†; organic brown rice)	105	mcg	35
Pantothenic Acid .. (40 mg†; *S. cerevisiae*)	10	mg	100
Calcium ..... (20 mg†; *S. cerevisiae*)	1	mg	<1
Iron ..... (90 mg†; *S. cerevisiae*)	4.5	mg	25
Iodine ..... (10 mg†; *S. cerevisiae*)	150	mcg	100
Magnesium.....(20 mg†; *S. cerevisiae*)	1	mg	<1
Zinc ..... (280 mg†; *S. cerevisiae*)	14	mg	93

Amount per Serving			% DV
Selenium ..... (15 mg†; S. cerevisiae)	15	mcg	21
Copper.....(20 mg†; *S. cerevisiae*)	200	mcg	10
Manganese.....(20 mg†; *S. cerevisiae*)	1	mg	50
Chromium (GTF) .. (30 mg†; *S. cerevisiae*)	60	mcg	50
Molybdenum ..... (15 mg†; *S. cerevisiae*)	30	mcg	40
Potassium .....(792 mg†; *S. cerevisiae*)	4	mg	<1
Boron ..... (50 mg†; *S. cerevisiae*)	500	mcg	**
Rejuvenating and Balancing Blend.....	81	mg	**
Organic Chaste Tree Berry, Organic Red Clover Flower, Organic Saw Palmetto Berry, Organic Ashwagandha Root, Organic Ginkgo Leaf, Organic Hawthorn Berry, Organic Sacred Basil Leaf, Organic Turmeric Root, Organic Milk Thistle Seed, Organic Ginger Root, Organic Nettle Leaf			
Immune Health Blend.....	34	mg	**
Organic Astragalus Root, Organic Eleuthero Root, Organic Whole Orange (natural source bioflavonoids), Organic Blueberry (natural source anthocyanins), Organic Cranberry (natural source proanthocyanidins), Organic Schisandra Berry, Organic Shiitake Mushroom			

*Full spectrum of mixed tocotrienols and tocopherols ** % Daily Value (DV) not established †Total Weight FoodState Nutrient to Deliver Daily Value

Other Ingredients: Plant Cellulose, Silica, Vegetable Lubricant.

Suggested Use: 1 tablet daily. May be taken anytime throughout the day, even on an empty stomach.

Allergen Statements

By law, manufacturers are required to disclose the presence of the eight most common food allergens:

- Shellfish
- Fish
- Eggs
- Dairy
- Wheat
- Tree Nuts
- Peanuts
- Soybeans

A declaration of “Allergen free” requires that companies test for the absence (or presence below an acceptable limit) of that specific allergen: for example, gluten free must be <20ppm of gluten upon testing

Excipients

Various types of excipients may be added for a variety of reasons:

- Fillers (i.e., plant cellulose, leucine, etc.)
- Binders
- Coating agents
- Preservatives
- Flavors
- Lubricants/Flow Agents (magnesium stearate)
- Solvents and emulsifiers

They may make manufacturing easier, help preserve the product, improve bioavailability, etc.

We Appreciate Your Time!

Any Questions?

Thank You!

We would like to thank Dr. Robert Luby, MD (Director of Medical Education Initiatives, The Institute for Functional Medicine), and Dan Lukaczer, ND (Director of Medical Education Programs, The Institute for Functional Medicine), for lending clinical insights and instructional design recommendations in the developmental stage of this project and for providing a clinical review of the guide.