Herbs as health food

Nutraceuticals

Introduction

- The term *Nutraceutical* is a combination of “Nutrition” and “Pharmaceutical.”
- It refers to foods or parts of foods that provide medical or health benefits, including the prevention and treatment of diseases.
- Nutraceuticals include dietary supplements, functional foods, medicinal foods, and farmaceuticals (foods from genetically modified crops).
- They are derived from natural sources such as plants, herbs, and animals and are considered safe for long-term use.
- Common forms include capsules, tablets, powders, beverages, and fortified food products.



Therapeutic Applications

- **Prevention of chronic diseases:** Help prevent conditions like cardiovascular diseases, diabetes, obesity, and certain cancers.
- **Immune modulation:** Enhance immune responses due to bioactive compounds (e.g., flavonoids, polyphenols).
- **Antioxidant effects:** Neutralize free radicals, protecting against oxidative damage and aging.
- **Anti-inflammatory effects:** Natural compounds (e.g., curcumin, omega-3s) reduce inflammation.
- **Gastrointestinal health:** Certain nutraceuticals improve gut flora and digestive health.
- **Mental health support:** Nutraceuticals like omega-3s and B-vitamins improve cognitive functions and mood.

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Antioxidants

Introduction

- Antioxidants are substances that prevent or delay cellular damage caused by free radicals (unstable oxygen molecules).
- Free radicals are by-products of cellular metabolism and external sources (pollution, UV light, smoking).
- Natural antioxidants include vitamins (A, C, E), carotenoids, polyphenols, selenium, and flavonoids.
- They are present in many plant-based foods such as berries, green tea, turmeric, cocoa, grapes, and leafy greens.

Therapeutic Applications

- **Cellular protection:** Prevent oxidative stress, protecting DNA, proteins, and lipids.
- **Anti-aging effects:** Delay age-related cellular degeneration (e.g., wrinkles, cataracts).
- **Cardiovascular health:** Inhibit LDL oxidation, reducing atherosclerosis and heart disease risk.
- **Cancer prevention:** Neutralize mutagenic free radicals, lowering cancer risk.
- **Neuroprotection:** Protect neurons from oxidative stress involved in Alzheimer’s and Parkinson’s.
- **Skin health:** Promote skin repair and protection against UV-induced damage.

Probiotics

Introduction

- Probiotics are live microorganisms (mainly bacteria and yeast) that provide health benefits when consumed in adequate amounts.
- Most common strains: *Lactobacillus*, *Bifidobacterium*, and *Saccharomyces boulardii*.
- Found in fermented foods like yogurt, kefir, kimchi, sauerkraut, miso, and probiotic supplements.
- They help maintain the natural balance of microflora in the gut.

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Therapeutic Applications

- **Gut health:** Improve digestion, reduce bloating, and treat diarrhea (especially antibiotic-associated).
- **Immune support:** Stimulate mucosal immunity and reduce infection rates.
- **Irritable bowel syndrome (IBS):** Alleviate symptoms like cramping, pain, and irregular bowel habits.
- **Inflammatory bowel diseases (IBD):** Aid in managing Crohn's disease and ulcerative colitis.
- **Mental health:** Influence the gut-brain axis, improving mood and reducing anxiety/depression.
- **Urogenital health:** Restore vaginal flora and prevent infections (e.g., bacterial vaginosis).

Prebiotics

Introduction

- Prebiotics are non-digestible food ingredients (mainly fibers and oligosaccharides) that promote the growth and activity of beneficial gut bacteria.
- Unlike probiotics, they are not live organisms but serve as food for probiotics.
- Common examples: Inulin, fructooligosaccharides (FOS), galactooligosaccharides (GOS), resistant starch.
- Found in foods like chicory root, garlic, onion, asparagus, banana, and whole grains.



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Therapeutic Applications

- **Enhanced gut flora:** Increase populations of *Lactobacilli* and *Bifidobacteria*.
- **Improved digestion:** Support regular bowel movements and reduce constipation.
- **Calcium absorption:** Help improve mineral absorption, particularly calcium and magnesium.
- **Immune enhancement:** Modulate immune responses through improved gut barrier function.
- **Reduction of pathogens:** Inhibit growth of harmful microbes by lowering pH and releasing SCFAs.
- **Metabolic regulation:** Support better glucose and lipid metabolism.

Dietary Fibres

Introduction

- Dietary fibers are indigestible components of plant foods that aid in digestion and overall metabolic health.
- Classified into:
  - **Soluble fiber:** Dissolves in water (e.g., pectin, gums, mucilage); slows digestion.
  - **Insoluble fiber:** Adds bulk to stool (e.g., cellulose, lignin); promotes bowel movement.
- Sources: Fruits, vegetables, legumes, whole grains, seeds, nuts.



Therapeutic Applications

- **Bowel regularity:** Prevent constipation by increasing stool bulk and frequency.
- **Cholesterol reduction:** Soluble fibers bind bile acids and reduce LDL cholesterol.
- **Blood sugar control:** Slow glucose absorption and improve insulin sensitivity.
- **Weight management:** Increase satiety and reduce appetite.
- **Colon health:** Lower risk of colon cancer by reducing transit time and toxin exposure.
- **Gut microbiome support:** Serve as prebiotics that nourish beneficial bacteria.

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