



SNS COLLEGE OF TECHNOLOGY
(An Autonomous Institution)
Coimbatore.

UNIT 4
NUTRACEUTICALS

Plant-Based Vs Animal-based Nutraceuticals

Classification:

Phytochemicals

Flavonoids

Examples: Quercetin (onions), catechins (green tea), anthocyanins (berries).

Benefits: Antioxidant, anti-inflammatory, and potential anti-cancer properties.

Carotenoids

Examples: Beta-carotene (carrots), lutein (spinach), lycopene (tomatoes).

Benefits: Eye health, skin protection, and immune support.

Glucosinolates

Examples: Found in broccoli, kale, and Brussels sprouts.

Benefits: Detoxification and cancer prevention.

Alkaloids

Examples: Caffeine (coffee), theobromine (chocolate).

Benefits: Stimulant effects and potential neuroprotective properties.

Terpenes

Examples: Limonene (citrus fruits), menthol (mint).

Benefits: Antimicrobial and anti-inflammatory effects.

Saponins

Examples: Found in legumes and quinoa.

Benefits: Cholesterol-lowering and immune-boosting properties.



Herbal Supplements

Examples:

Turmeric (Curcumin): Anti-inflammatory and antioxidant.

Ginger: Anti-nausea and digestive aid.

Garlic: Cardiovascular health benefits.

2. Sources and Forms

Whole Foods: Fruits, vegetables, legumes, grains.

Extracts: Concentrated forms, e.g., green tea extract.

Powders: Superfoods like spirulina, acai.

3. Health Benefits

Antioxidant activity, anti-inflammatory effects, immune support, and potential anti-cancer properties.

4. Regulatory Aspects

FDA Guidelines: Classifies dietary supplements; requires proper labeling.

Health Claims: Structure/function claims vs. disease claims.

Animal-Based Nutraceuticals

1. Classification

Fatty Acids

Examples:

Omega-3 Fatty Acids: Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) from fish.

Benefits: Cardiovascular health, anti-inflammatory.



Proteins and Peptides

- Examples:
- Collagen: Sourced from skin, bones of animals.
- Benefits: Joint health, skin elasticity.

Probiotics

- Examples:
- Lactobacillus and Bifidobacterium strains found in yogurt and kefir.
- Benefits: Gut health, immune function.

Vitamins and Minerals

- Examples:
- Vitamin D: Found in fatty fish and fortified dairy.
- Benefits: Bone health and immune support.

Bioactive Lipids

- Examples: Conjugated linoleic acid (CLA) from dairy and beef.
- Benefits: May aid in weight management and muscle retention.

2. Sources and Forms

- Fish and Seafood: Rich in omega-3 fatty acids.
- Meat and Bone Broth: Sources of collagen and minerals.
- Fermented Dairy: Yogurt and cheese as sources of probiotics.

3. Health Benefits

- Heart health, joint support, gut health, and potential cancer risk reduction.

4. Regulatory Aspects

- Research-based safety and efficacy required for claims; transparency in labeling.



Comparative Analysis

1. Bioavailability

- Plant-Based: May require metabolic conversion (e.g., beta-carotene to vitamin A).
- Animal-Based: Generally higher bioavailability (e.g., heme iron vs. non-heme iron).

2. Sustainability

- Plant-based nutraceuticals often viewed as more sustainable.
- Concerns with animal-based nutraceuticals regarding animal welfare and environmental impact.

3. Cultural and Ethical Considerations

- Influences on dietary choices, including vegetarianism and veganism.