NUTRACEUTICALS & SUPPLEMENTS

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FWRA SYMPOSIUM 2012

Nutraceuticals

- “Food or part of food that provide medical or health benefits, including the prevention and treatment of disease”
  - Dr. Stephen DeFelice, Foundation for Innovation in Medicine
    - Coined term around 1989
- A food stuff (as a fortified food or a dietary supplement) that provides health benefits
  - The latest edition of the *Merriam-Webster Dictionary*
- Nutraceutical foods are not subject to the same testing and regulations as pharmaceutical drugs

Nutraceuticals- Food as Medicine

- Food Analysis
  - Flavor (sensory taste & texture)
  - Nutritional Value
    - Carbohydrates, fats, proteins, water, vitamins & minerals
- Link between food and medicine
  - Chemical components
    - Derived from plant, food & microbial sources
      - Probiotics
      - Antioxidants
      - Phytochemicals

Nutraceuticals

Includes a wide scope of products

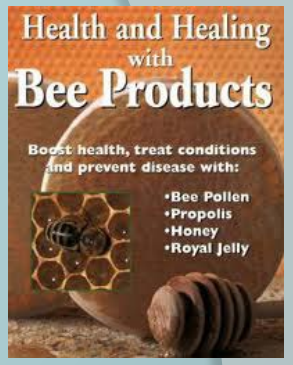
- Dietary Supplements (Whole food supplements)
  - Vitamins, amino acids, essential fatty acids (EFAs), minerals, enzymes, organ tissues, glandulars & herbs
    - Standard Process, MediHerb, Virbac
- Functional Food (enriched or fortified food products)
- Medicinal Food
    - Ensure, Rebound, Emeraid, Oxbow, Clinicare, Boost, etc.

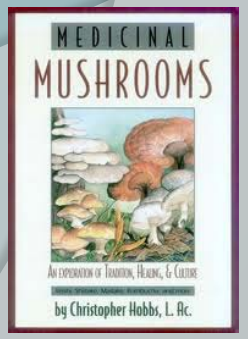
Nutraceuticals

- Multi Vitamins
  - Vita hawk, Pet tabs, Seabird Tabs, Oasis, Pet tinic, Actipet, SP
- Omega fatty acids
  - Fish oil, Emu Oil, Flax seed oil, etc
- Homeopathics
  - Bach Flower Remedies
  - Heel Homeopathic Medicines
  - Homeopet
  - Healx

Nutraceuticals

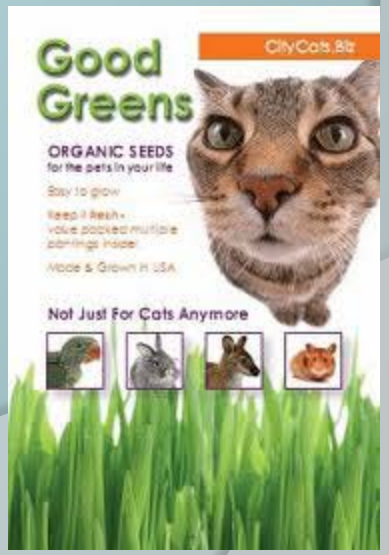
- Bee Products (Apitherapy)
  - Honey (also sugar used for wound care)
  - Propolis, Royal Jelly, Bee Pollen, Venom
    - Start at low dose anaphylaxis risk
- Yeast
  - Red yeast rice/ red rice koji
    - *Monascus purpureus*
      - Mold grown on rice
    - Statin effects
- Medicinal Mushrooms
  - Reishi, Shiitake, Maitake, etc.
    - Genesis Resources, Mushroom Science, MUSH





Nutraceuticals

- Green Food Products
  - Chlorophyll, Beta-Carotene, Protein
- Micro-Algae
  - Spirulina, Chlorella, Wild Blue-green, Dunaliella
- Wheat and Barley Grass
- Vitamin A and Beta-Carotene



Nutraceuticals

- Herbal
  - Traditional Chinese Herbs
    - JingTang, SunTen, Seven Forests, Kan Herb, Golden Flower, Millennium, Natural Path Herbs
  - Phytomedicine
    - Plants or plant parts
      - Aconite, Aloe, Arnica, Boswellia, Cardamom, Chamomile, Garlic, Ginger, Juniper, Lycopene, Nutmeg, Pumpkin, SAM-e, St. John's Wort, Echinacea, milk thistle, etc.
    - Essential oils (Aromatherapy)
      - Eucalyptus, Lavender, Clove, Neem, etc.

Nutraceuticals-Essential Oils (Aromatherapy)

- A concentrated hydrophobic liquid containing volatile aroma compounds from plants.
  - Aka volatile oils, ethereal oils or aetherolea, or simply as the "oil of" the plant from which they were extracted
    - Eucalyptus oil, clove oil, rose oil, lavender oil
- An oil is "essential" in the sense that it carries a distinctive scent, or essence, of the plant.
  - Generally extracted by distillation, expression or solvent extraction.
    - Used in perfumes, cosmetics, soaps and other products, for flavoring food and drink, and for adding scents to incense and household cleaning products.
    - Medicinal uses
- Derived from different parts of plants
  - Berries, seeds, bark, wood, rhizome, root, resin, leaves, flowers and peels

Nutraceuticals-Essential Oils (Aromatherapy)

- Taken by mouth, many essential oils can be dangerous in high concentration.
  - Typical effects begin with a burning feeling, followed by salivation.
  - In the stomach, the effect is carminative, relaxing the gastric sphincter and encouraging eructation (belching).
    - Further down the gut, the effect typically is antispasmodic.
      - Eucalyptus oils, menthol, capsaicin, anise and camphor.

Nutraceuticals-Essential Oils (Aromatherapy)

- Gastric effects/Digestion/GI
  - Fennel oil, Ginger oil, Green Cardamom oil, Oregano oil, Peppermint oil, Star Anise oil, Valerian oil, Wintergreen oil
- Antiinflammatory
  - Chamomile oil, Goldenrod oil, Neem oil
- Antifungal
  - Citronella oil, Oregano oil, Rosemary oil, Sage oil, Thyme oil

Nutraceuticals

- Essential Oils (Aromatherapy)
  - Those that do work well for upper respiratory tract and bronchial problems act variously as mild expectorants and decongestants.
    - Camphor oil, Eucalyptus oil, Spruce oil, Horseradish oil
  - Some act as locally anesthetic counterirritants, and thereby exert an antitussive effect.
    - Clove oil, wintergreen oil, tsuga (pine family), spruce oil
  - Sedative/anxiolytic
    - Chamomile, Ginger, Lavender, Lemon balm, Valerian, Ylang ylang

Nutraceuticals

- Essential Oils (Aromatherapy)
  - Diuretic effects
    - Juniper oil, horseradish and agathosma oil
  - Antibacterial properties
    - Tea tree oil, Ylang ylang, Wintergreen, Rosemary oil, Lime oil, Ginger oil, Horseradish oil, Lemon Balm (*Melissa officianalis),* Sage oil, Star Anise oil, Thyme oil, etc.
      - Oils that are antibacterial but can have neurotoxic effects
        - Tea tree, Ylang ylang, Mugwort, Pine, Japanese star anise

Nutraceuticals-Essential Oils (Aromatherapy)

- Antiseptic
  - Chamomile oil, Lavender oil, Lemon oil, Lemon Balm oil, Lime oil, Oregano oil, Pine oil, Tea tree oil, Thyme oil, Clove oil, Camphor oil, Turpentine oil
    - Camphor and turpentine also used in liniments can be irritants as well
- Germicidal
  - Davona oil, Eucalyptus oil
- Antioxidant
  - Oregano oil, Star Anise oil
- Anesthetic
  - Clove oil (Eugenol)

Nutraceuticals-Essential Oils (Aromatherapy)

- Muscle Aches
  - Black pepper, Lavender, Myrrh, Rosemary, Spruce and Wintergreen
- Rheumatism
  - Birch, Bay, Camphor, Myrrh, Yarrow, Neem, Wintergreen, Spruce, Tsuga, Star Anise
- Fever
  - Ginger oil, Camphor oil, Neem oil

Nutraceuticals-Essential Oils (Aromatherapy)

- Insect repellents
  - Citronella oil, Lemon grass oil, Lavender oil, Neem oil
- Antihelminthics
  - Chamomile (vermifuge), tobacco, Neem, Black walnut, Clove, Garlic, Diatomaceous earth, Kalonji seeds, Honey mixed with water and vinegar

Nutraceuticals-Essential Oils (Aromatherapy)

- Many essential oils affect the skin and mucous membranes in ways that variously are valuable or harmful.
  - They are used in antiseptics and liniments in particular.
  - Typically, they produce rubefacient irritation at first, and then counterirritant numbness.
    - Turpentine oil and camphor are two typical examples of oils that cause such effects.
    - Menthol and some others produce a feeling of cold followed by a sense of burning. This is caused by its effect on heat-sensing nerve endings.
  - Many of the citrus peel oils, are photosensitizers, increasing the skin's vulnerability to sunlight.

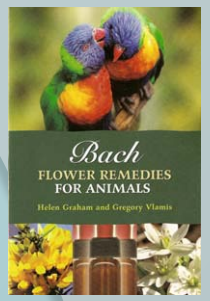
Nutraceuticals-Essential Oils (Aromatherapy)

- The potential danger of an essential oil is generally relative to its level or grade of purity.
- Many essential oils are designed exclusively for their aroma-therapeutic quality;
  - These essential oils generally should not be applied directly to the skin in their undiluted or "neat" form.
  - Some can cause severe irritation, provoke an allergic reaction and, over time, prove hepatotoxic.
- Non-therapeutic grade essential oils are never recommended for topical or internal use.
  - Essential oils should not be used with animals, as they possess extreme hepatotoxicity and dermal toxicity for animals, especially for cats.
  - Instead, essential oils should be blended with a vegetable-based carrier oil (as a base, or "fixed" oil) before being applied.
    - Common carrier oils include olive, almond, hazelnut and grapeseed.
  - Only neutral oils should be used.
  - A common ratio of essential oil disbursed in a carrier oil is 0.5–3% (most under 10%), depending on its purpose.
  - Some essential oils, including Even certain therapeutic grade oils can pose potential threats to individuals with epilepsy, or pregnant women.

Nutraceuticals-Bach Flower

- Energentic or Vibrational formulations
  - Extremely diluted flower materials
  - No characteristic scent or taste of the plant
  - 38 original flowers
- Dew collected from the flowers of plants contains some of the properties of the plant
  - more potent on flowers grown in the sun.
- Picked flowers and steeped them in a bowl of water under sunlight.
  - If this was impractical due to lack of sunlight or other reasons, he decided the flowers may be boiled.
  - "mother tincture", which is then further diluted before sale or use.
- Process of combination of the four elements:
  - The earth to nurture the plant, the air from which it feeds, the sun or fire to enable it to impart its power, and water to collect and be enriched with its beneficent magnetic healing

Nutraceuticals-Bach Flower



- Rescue remedy
  - Combination product
  - Contains an equal amount each of Rock Rose, Impatiens, Clematis, Star of Bethlehem and Cherry Plum remedies.
    - Used for treating stress, anxiety, and panic attacks, especially in emergencies.
- Mimulus
  - Courage and confidence
  - Used to overcome general fears
    - Fears of unknown conditions
- Rock Rose
  - Acute fears bordering on terror
- Aspen
  - Vague fears of foreboding and apprehension that cannot be clearly defined.

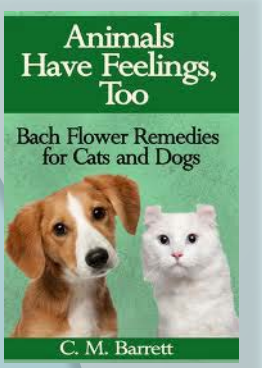
Nutraceuticals-Bach Flower

- **Beech**
  - More tolerant of other animals and people A loss of self-control, violently scratching itself
- **Cherry Plum**
  - A self-controlled animal Repeated unsuccessful behavior patterns, doesn't learn from past mistakes
- **Chestnut Bud**
  - Allows the animal to learn from experience so it can move on in life and not repeat the same mistakes Possessive in nature, very territorial. Manipulatively loving to keep control
- **Chicory**
  - A more unselfish, self-assured, loving animal No apparent interest in the world around them: animals who sleep all the time, have trouble paying attention, or seem to live more in a dream than in the present
- **Clematis**
  - Enables the animal to develop a more lively interest in the world around them and enjoy and participate in life
  - Obsessive cleanliness, fastidiousness; excessive grooming. Pets with rashes

Nutraceuticals-Bach Flower

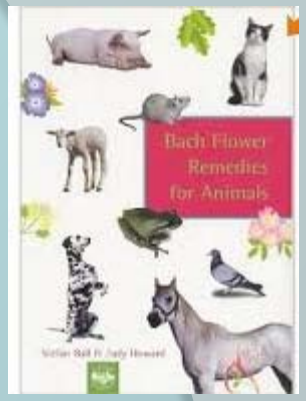
- **Crab Apple**
  - An animal that is more relaxed, accepting itself and its imperfections. It has a cleansing effect.
  - Overwhelmed by a sense of responsibility froma temporary circumstance: abadoning their litter
- **Elm**
  - Restores confidence, positive outlook and coping capabilities in the animal
  - Despondency due to a setback; eg; not going for a walk as usual creates lethargy and sadness
- **Gentian**
  - Restores optimism (May also need Honeysuckle)
  - Overly concerned with companionship. Constant barking
- **Heather**
  - A pet that does not need to be the center of attention
  - Jealousy of other animals or a new baby in the home. Angry growling, hissing, barking, snapping or unprovoked attacks
- **Holly**
  - An animal that is more compassionate and willing to share with other animals
  - Homesickness or over-attachment to the past. Loss of owner or home
- **Honeysuckle**
  - Animals become self-assured, adjust to its new home or environment. (May also need Walnut)
  - Lethargy or lack of enthusiasm to go anywhere, but once engaged in an activity or game is fully involved

Nutraceuticals-Bach Flower



- **Hornbeam**
  - Restores vitality, enthusiasm, and spontaneity. (May also need Wild Rose)
  - Impatient and seeming to have boundless energy; can't wait to go for a walk or rushes ahead
- **Impatiens**
  - Animals become more patient
  - Lack of self-confidence or avoiding situations where they have to perform
- **Larch**
  - Boosts self-esteem, cofidence and determination
  - For fears; afraid of lightening, visits to the vet. May shake or shiver when confronted. Shy and timid animals
- **Olive**
  - A restoration of strength and vitality. (Always ensure proper nutrition as well)
  - Terror, panic-stricken: body trembling, cowers or runs away
- **Scleranthus**
  - Results in a more decisive and balanced animal
  - Abused, mistreated in the past. Trauma or shock
- **Star of Bethlehem**
  - Neutralizes the effects of shock or trauma
  - Enthusiastic, always want to be involved, high strung

Nutraceuticals-Bach Flower



- **Vervain**
  - Assists animals to be more calm and able to relax
  - Authoritative, dominant even over their owners
- **Vine**
  - Allows animal to be determined not domineering
  - For any period of change
- **Walnut**
  - Helps the animal ease into its new surroundings or situation
  - Unfriendly, stand-offish: do not invite or welcome cuddles, petting or obvious affection
- **Water Violet**
  - Produces a compassionable and sociable animal
  - Loss of sense of direction or purpose; especially good for working or show animals who are being retired
- **Wild Oat**
  - Restores ambition and sense of purpose for the animal (may also need Walnut)
  - Lack of energy, enthusiasm: submissive and disinterested
- **Wild Rose**
  - Creates a lively interest in life
  - Stressful situations: visits to the vet, being left alone, adapting to new surrounding. Fear of loud noises, such as firework and thunder. Excessive barking or hissing

Nutraceuticals- Herbal

- American Herbal Products Association (AHPA)
  - 1997 published *Botanical Safety Handbook*
    - Class 1
      - Herbs which can be safely consumed when used appropriately
    - Class 2
      - Herbs for which the following restrictions apply, unless otherwise directed by an expert qualified in the use of the described substance

Nutraceuticals-Herbal

- American Herbal Products Association (AHPA)
  - 1997 published *Botanical Safety Handbook* (cont'd)
    - Class 2
      - 2a For external use only
      - 2b Not to be used during pregnancy
      - 2c Not to be used while nursing
      - 2d Other specific restrictions as noted
    - Class 3
      - Herbs for which significant data exist to recommend labeling that states to be used only under expert supervision
        - Labeling must have safety information
    - Class 4
      - Herbs for which insufficient data are available for classification

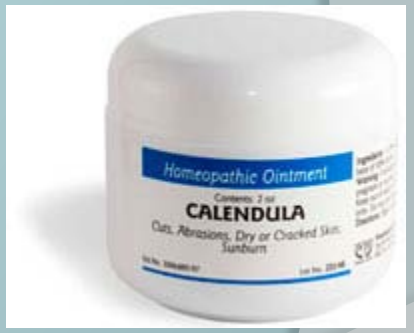
Nutraceuticals-Herbal

- Herbal preparations
  - Teas
    - Herbs prepared in water
    - Infusions
      - Dried or fresh flowers or leaves steeped in boiling water
    - Decoctions
      - Dried or fresh roots, bark, seeds or stems simmered in water
  - Capsules
    - Powdered or ground herbs encapsulated
    - Commercially prepared capsules, tea pills or fluid extracts
  - Tinctures
    - Extracts of herbs in alcohol or another medium
      - Soak herbs in 60-80 proof alcohol (e.g.. Vodka)

Nutraceuticals-Herbal

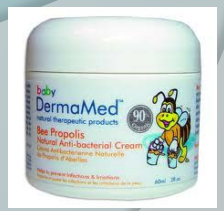
- Yunnan Paiyao Yunnan Baiyao

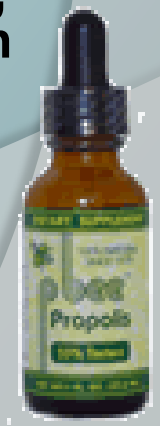
Nutraceuticals-Herbal



Nutraceuticals- Bee Products

- **Propolis**
  - **Honey bees collect the sap or resin from trees, such as poplar or birch, tree buds, and other plant sources, combine it with their own enzymes, and create propolis.**
    - **The exact composition of propolis varies from hive to hive, district to district, and season to season. Normally it is dark brown in color, but it can also be red, black or white.**
    - **Honey bees are opportunists who gather what they need from available sources, so the composition of propolis varies with the local vegetation**
    - **Raw propolis is composed of 50-70% resins and balsams, 30-50% wax, 5-10% pollen and 10% essential oils. It is rich in trace minerals**
    - **capsule form, tinctures, lozenges, throat spray , chewing gum and soothing creams**
  - **Used for joint pain, stress & general well being**





Nutraceuticals- Bee Products

- Royal Jelly
  - **Considered the "Crown Jewel" of the beehive.**
    - **Royal Jelly is an incredibly rich, creamy, opalescent, white liquid, synthesized by the worker bees exclusively for the queen bee.**
    - **This substance is so remarkable, that it transforms a common honey bee into a Queen Bee, and extends her life span from six weeks to five years!**
  - **Royal Jelly contains an abundance of nutrients, including essential minerals, B-complex vitamins, proteins, amino acids, collagen, essential fatty acids, just to name a few!**
    - **Royal Jelly is so highly complex a compound, that it has been extremely difficult for scientists to synthesize its compounds, or completely breakdown its components!**
  - **capsules, soft gels, liquid vials and creams**
  - **Used for energy and general well being**

Nutraceuticals- Bee Products

- Bee Pollen
  - **Pollen which is collected from the flowering plants, and stored by honey bees in their hives.**
    - **The bees only select and collect pollens that are rich in amino acids.**
    - **Scientific studies have described Bee Pollen as almost a complete food, containing nearly every nutrient required to sustain life.**
    - **Richer in proteins than any animal source, yet, its fat content is very low.**
  - **Used for energy and endurance**

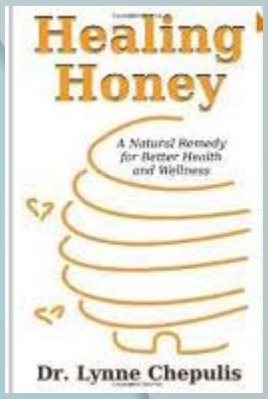
Nutraceuticals- Bee Products

- Honey
  - Made by bees using nectar from flowers
    - Honey produced by honey bees (genus *Apis*)
    - Regurgitated by bees to make honey
      - Food source for bees
      - Food source for many animals

Nutraceuticals- Bee Products

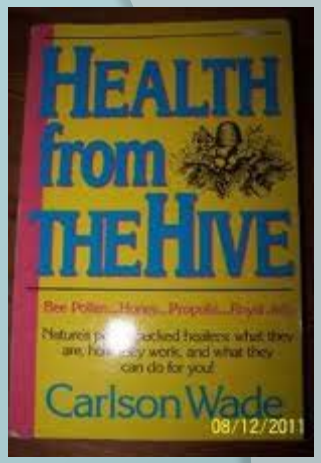
- Honey
  - Topically enhances wound healing and has been shown to have antimicrobial properties
    - Most microorganisms do not grow in honey because of its low water activity (osmotic effect)
      - Can contain dormant endospores of *Clostridium botulinum*
    - Hydrogen peroxide is formed by glucose oxidase acting as an antiseptic
    - The pH of honey is commonly between 3.2 and 4.5
      - Relatively acidic pH level prevents the growth of many bacteria.

Nutraceuticals- Bee Products



- Honey
  - The nonperoxide antibiotic activity is due to methylglyoxal (MGO) and bee defensin-1
  - Antioxidants in honey have even been associated with reducing the damage done to the colon in colitis in a study involving administering honey enemas to rats.
    - Consistent with claims made in its use in many traditions of folk medicine
  - Honey has also been used for centuries as a treatment for sore throats and coughs and, according to recent research, may be an effective soothing agent for coughs

Nutraceuticals- Bee Products



- Honey
  - Widely believed to alleviate allergies
    - No scientific proof when studied vs placebo
    - Bee pollen
      - inhibition of IgE immunoglobulin binding to mast cells
- Risks
  - Botulism
    - Do not feed to animals or use as wound dressing if <1yr of age
  - Toxic honey
    - Honey produced from flowers of oleanders, rhododendrons, mountain laurels, sheep laurel, and azaleas may cause honey intoxication.
      - Symptoms include dizziness, weakness, excessive perspiration, nausea, and vomiting.
      - Less commonly, low blood pressure, shock, heart rhythm irregularities, and convulsions may occur, with rare cases resulting in death.

Nutraceuticals-metals

- Colloidal Silver

Nutraceuticals- Venom

- Venom-based therapy using bee, snakes and scorpions venom and/or sea anemones toxin has been recently developed because current investigations have identified the various components and molecular mechanism of the effects of venoms under in vitro and in vivo conditions
  - MS, FIV, FeLV, thrombosis, cancer and many other diseases

Nutraceuticals- Bee Products

- Bee Venom
  - Used since ancient times to treat arthritis, rheumatism, back pain, skin diseases and in this modern age as an alternative therapy to treat multiple sclerosis, Lyme disease and chronic fatigue syndrome
  - Traditionally, bee venom was administered with live bees by stimulating them to sting in the affected area, trigger points or acupuncture points.
  - Standardized injectable venom solution prepared from pure bee venom (*Apis Venenum Purum*)

    - Administered intradermally just between the skin layers or subcutaneously under the skin to imitate the effect of a bee sting.
      - Each injection is equivalent to or is less than the average dry venom sac content of a honey bee.
      - Injections are painful
  - Bee venom is also used topically in creams, liniments and ointments.
  - The application of venom solution with electrophoresis or ultrasonophoresis is practiced in Europe and China

Nutraceuticals

- Snake and Scorpion Venom
  - Venom has two main functions: first, the immobilization of prey and second, the digestion of prey. It is a complex mixture of proteins, enzymes, and various other substances.
  - Research with using venom to treat certain cancers is ongoing
    - Southern US copperhead
      - Contortrostatin protein isolated from venom
      - Believed to inhibit tumor growth and metastasis
    - Blue Scorpion
      - 131I-TM-601 is a radiopharmaceutical containing a synthetic version of a substance derived from scorpions called chlorotoxin
      - Precisely locate and bind to their receptor, which is abnormally expressed on tumor cells, but not on normal cells.

Nutraceuticals- Venom

- Snake Venom
  - Research into using Exanta, also known as ximelagatran, to replace Coumadin (Warfarin)
    - Derived from the venom of the cobra, which seems to render victims powerless by thinning their blood.
    - Reducing the likelihood of blood clots that can block arteries and contribute to stroke or heart attack.
    - Coumadin works by interfering with the body's absorption of vitamin K from food
      - Even a minor change in a person's normal diet can disrupt Coumadin levels.
      - Coumadin interacts with a variety of drugs, making them work improperly or vice versa

Nutraceuticals-Medicinal Mushrooms

- Anticancer activities
- Cholesterol synthesis inhibitors
- Antimicrobial and antiviral activities
- Vitamin D Compounds
- Psychotropic activities
- Anti hyperglycemic activities
- Anti-inflammatory activities

Nutraceuticals-Medicinal Mushrooms

- **In vitro anti-viral properties**
  - Agaricus blazei - Polio, Western equine encephalitis
  - Cordyceps sinensis - Hepatitis B
  - Coriolus versicolor – HIV
  - Ganoderma lucidum (Reishi) - HSV-1, HSV-2, Influenza virus, Vesicular stomatitis
  - Hypsizygus tessellatus - Epstein-Barr virus
  - Inonotus obliquus (Chaga) - Influenza virus
  - Kuehneromyces mutabilis - Influenza virus
  - Lentinula edodes (Shiitake) - HSV-1, HIV, Influenza virus, Vesicular stomatitis (contains a proteinase inhibitor.)
  - Piptoporus betulinus - Pox virus
  - Pleurotus eryngii - Tobacco mosaic virus
  - Pleurotus ostreatus (Oyster mushroom) - HIV

Nutraceuticals-Medicinal Mushrooms

- **In vitro anti-microbial effects**
  - Agaricus blazei - escherichia coli
  - Flammulina velutipes (Enokitake) - staphylococcus aureus
  - Fomes fomentarius - escherichia coli, pseudomonas aeruginosa
  - Ganoderma applanatum - Bacillus cereus, escherichia coli
  - Ganoderma lucidum (Reishi) - aspergillus niger, Bacillus cereus, candida albicans, escherichia coli
  - Grifola frondosa (Maitake) - candida albicans
  - Hericium erinaceus - aspergillus niger, Bacillus cereus, candida albicans
  - Lentinula edodes (Shiitake) - candida albicans, listeria monocytogenes, mycobacterium tuberculosis, staphylococcus aureus, steptococcus pneumoniae, streptococcus pyogenes
  - Piptoporus betulinus - Bacillus cereus, pseudomonas aeruginosa, pseudomonas fluorescens
  - Pleurotus ostreatus (Oyster mushroom) - aspergillus niger, Bacillus cereus, escherichia coli, plasmodium falciparum, pseudomonas aeruginosa, pseudomonas fluorescens
  - Sparassis crispa - Bacillus cereus
  - Trametes versicolor - aspergillus niger, candida albicans, escherichia coli, steptococcus pneumoniae

Nutraceuticals-Medicinal Mushrooms



- CAS Options (Genesis Resources)
  - Concentrated, synergistic blend of Reishi, Maitake and Shiitake mushrooms
    - Potent immune enhancers
    - Reduces inflammation
    - Stimulates NK and T helper cell activity
  - Strong antioxidants
    - Coenzyme Q-10, Green Tea, Selenium, N-acytlcysteine, Vit A, Vit E and Vit C
  - Indications: Mast cell tumors, Squamous cell carcinomas (esp of head, mouth & ears), Sarcomas, melanomas and lymphomas, complementary to surgery, radiation and chemo, as another option to cytotoxic drugs, when chemo is cost prohibitive.

Nutraceuticals- EFAs Emu Oil

- A food by-product
  - Refined from the fat of an emu
  - All natural
    - Used by the Aborigines of Australia
  - Refined, sterilized & deodorized
    - NOT rendered which is only filtered, contaminants
- High in EFAs
  - Omega 3, 6, 7 & 9
  - Cannot be manufactured by the body
  - Must be obtained by food

Nutraceuticals- EFAs Emu Oil

- Omega 3
  - Good for the heart & for cholesterol
  - Play crucial role in brain function
    - Concentrated in the brain
    - Cognitive (memory & performance)& behavioral fnx.
  - Important for normal growth and development
  - Anti-inflammatory & anti-coagulant properties
  - Help prevent risk factors associated with chronic dz.
    - Heart disease, cancer & arthritis
  - Deficiency: fatigue, poor memory, dry skin, heart problems, mood swings, depression & poor circulation
  - Excess: bleeding & hemorrhagic stroke

Nutraceuticals- EFAs Emu Oil

- Omega 6
  - Crucial for brain function
  - Needed for normal growth and development
  - Necessary for stimulating skin & hair growth
  - Maintenance of bone health
  - Regulation of metabolism
  - Maintaining reproductive capability
  - Pro-inflammatory, but anti inflammatory in diet
  - Diet should have 2-4 x more 6 than omega 3

Nutraceuticals- EFAs Emu Oil

- Omega 9
  - Not an EFA
    - Created in body from unsaturated fat
      - Monounsaturated
      - Found in olive oil
    - Oleic & Erucic acid
    - Reduces risk
      - arteriosclerosis, cardiovascular disease & stroke
    - Healthy immune system functioning

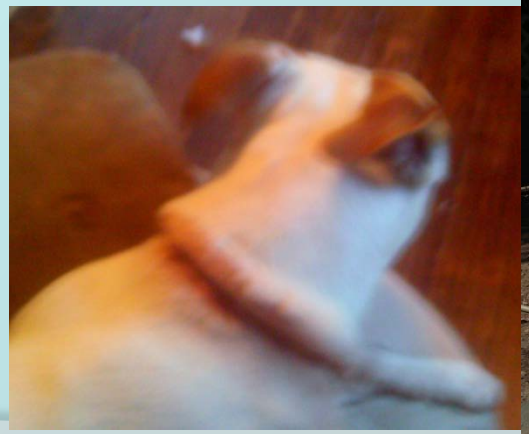
Nutraceuticals- EFAs Emu Oil

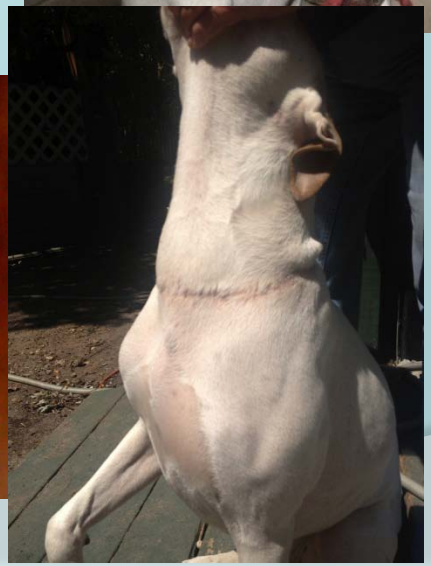
- Hypoallergenic
  - Non-irritating, no known side effects
  - Irritation level equivalent to water at full strength
- Non-comedogenic
  - Does not clog pores
- Anti-inflammatory
  - Reduces pain, swelling, stiffness in joints & muscles
  - Recent bruising, eases muscle & tendon strains
  - No NSAID side effects
- Anti-Bacterial & anti-fungal
  - Long shelf life
  - No odor

Nutraceuticals- EFAs Emu Oil

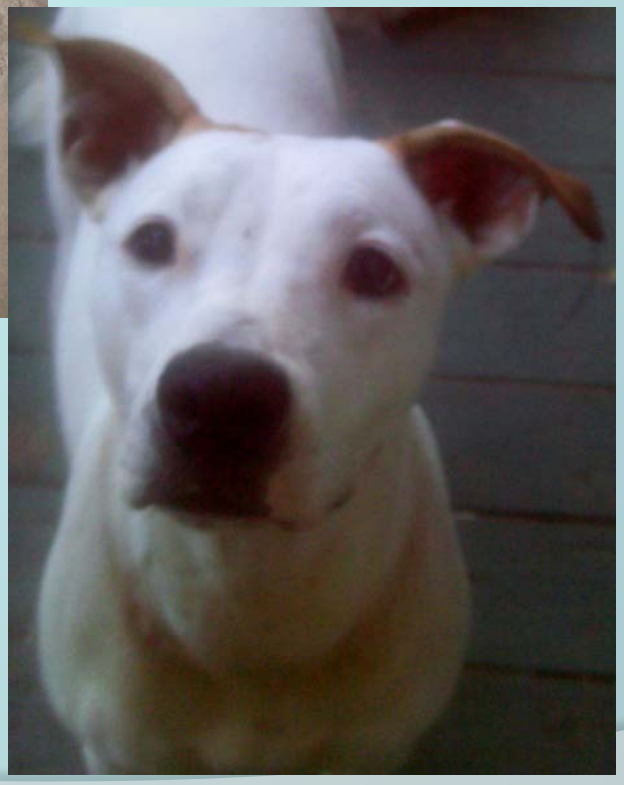
- Wound healing
- Anti-inflammation
- Anti-bacterial (bacteriostatic)
- Anti-viral
- Anti-fungal
- Cholesterol lowering (LDL)
- Transdermal carrier, increases absorption
- Arthritis & pain relief
- Skin conditions
  - Rashes, eczema, chemical, sun & grease burns
  - Softening of skin, does not clog pores, reduces scarring, age spots, stretch marks
- Ingestible, improves bodily functions & energy levels

Nutraceuticals- EFAs Emu Oil





Nutraceuticals- EFAs Emu Oil



Nutraceuticals- Heel

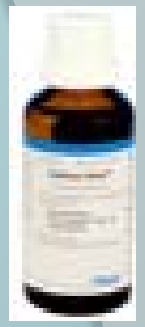
- Discus Compositum
  - Discogenic disease
    - Root impairment
    - Intervertebral neuralgia
    - Impairment of connective tissue
    - Rheumatic disorders
  - Injection, oral vials, sublingual tablet

Nutraceuticals- Heel

- Engystol
  - Stimulation of the nonspecific defense system in viral infections
    - Influenza
    - Cold sores
    - Feverish conditions
  - Injection, oral vial, sublingual tablet

Nutraceuticals- Heel

- Galium-Heel
  - Stimulation in the defense mechanism in:
    - Chronic illness
    - Viral infections such as colds and flu
- Gripp-Heel
  - Temporary relief of symptoms of influenza
    - Fever
    - Malaise
    - Body aches
    - Painful joints
  - Injection, oral vials, sublingual tablet



Nutraceuticals- Heel

- Nervoheel
  - Temporary relief of symptoms of stress
    - Restlessness and insomnia
    - Restlessness in children
    - Nervous tension
    - Stress due to premenstral syndrome or menopause
  - Sublingual tablet

Nutraceuticals- Heel

- Oculoheel
  - Irritaion of the eye and eye strain
  - Single use vials

- Ypsiloheel
  - Temporary relief of stress and nervous irritibility
    - Globuus hystericus
    - Difficulties with speech
    - Laryngitis
  - Sublingual tablet

Nutraceuticals- Heel

- Vertigoheel
  - Treatment of symptoms of vertigo and other related imbalance disorders
    - Nausea
    - Motion sickness
    - Dizziness
  - Injection, Oral drops,Sublingual tablets

Nutraceuticals- Heel

- Traumeel
  - Temporary relief of
    - Muscular pain
    - Joint pain
    - Sports injuries
    - Bruising
  - Injection, oral vial, oral drops, sublingual tablet, tablet, cream (ointment), gel
  - Antiinflammatory, analgesic

Nutraceuticals- Heel

- Zeel
  - Temporary relief of mild to moderate
    - Arthritic pain
    - Osteoarthritis
    - Joint stiffness
  - Injectable, oral vial, cream (ointment)

Nutraceuticals- Whole Food

- Standard Process
  - Organic
  - Gandulars, herbs, plant
    - GMO & Pesticide free
  - Entire human and veterinary line

Nutraceuticals- Whole Food

- Standard Process
  - **K9 Flex support**
    - encourages the normal repair and rebuilding of cartilage and provides targeted joint protection
  - **K9 Musculoskeletal support**
    - Provide a wide range of essential nutrients
    - Helps maintain optimal health and function
    - Helps tissues respond to extra demands by promoting regeneration
    - Indications for Use:
      - General growth support
      - Performance/working animals
      - Senior animals
      - General musculoskeletal support
      - Neuromuscular disorders

Nutraceuticals- Joint Formulas

- Glucosamine Chondroitin
  - Standard process
    - Canine Musculoskeletal Support
    - Canine Flex Support
    - Equine Mobility
  - Nutramax
    - Dasuquin
    - Cosequin
  - Genesis Resources
    - Feline Pain Plus
  - Promotion

Nutraceuticals- Whole Food

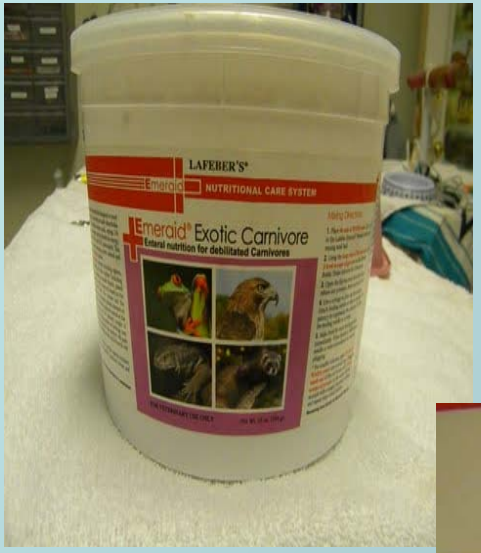
- Dr. Harrison's line

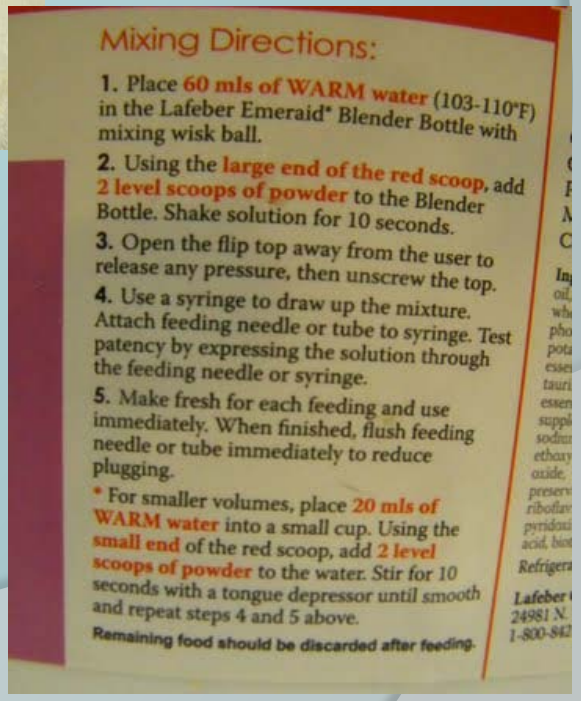
Nutraceuticals- Whole Food

- Enzymes
- Enzymatic products
  - Zymox

Nutraceuticals- Medicinal Food

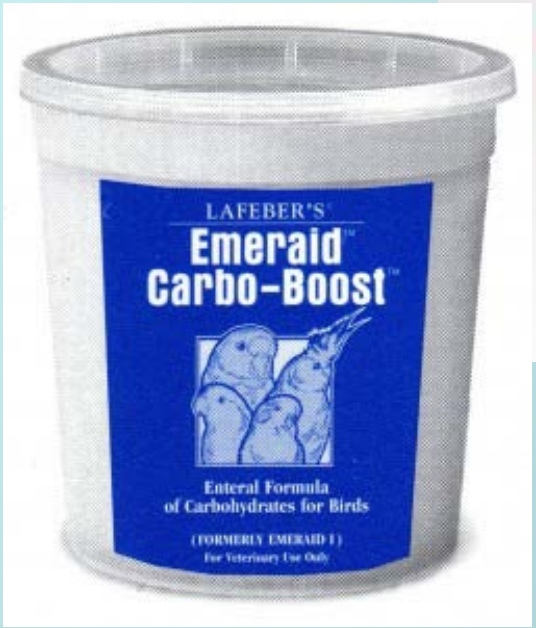
- Emeraid
  - Emeraid Carnivore
    - Calculate RER
      - Seabirds
        - 90(BW)0.75
      - Nonpasserine
        - 78(BW)0.75
      - Kcal/day
    - DER
      - Debilitated adults
        - RER X 3-4
      - Debilitated young
        - RER X 5
    - Calculate ml/day
      - Divide by Kcal/ml
        - Emeraid
          - 5.16 Kcal/g
          - 2.1 Kcal/ml prepared
    - Daily amount divided into 3-4 X day
    - Start at 50% of the amount
    - Increase every 2 feedings

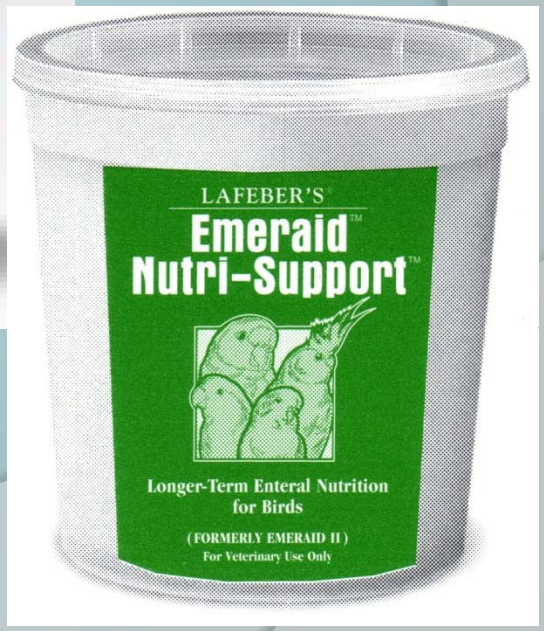




Nutraceuticals- Medicinal Food

- Emeraid



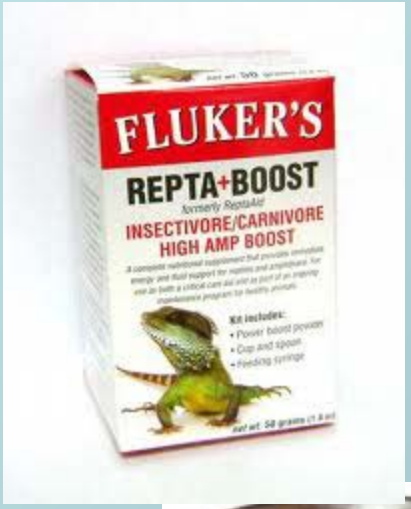


Nutraceuticals- Medicinal Food

- Oxbow

Nutraceuticals- Medicinal Food

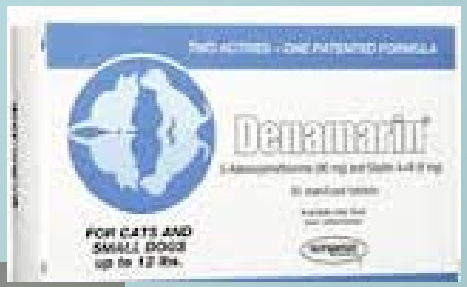
- Rebound
- Boost
- Ensure
- Clinicare

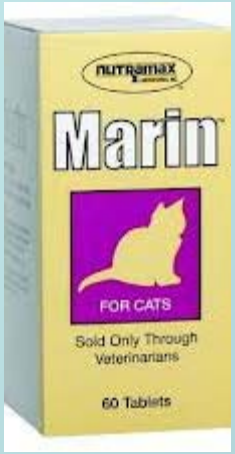


Nutraceuticals- Calming

Nutraceuticals- Liver protectants

- SAMe
- Milk Thistle
- Denosyl
- Marin





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