

## T E C H N I C A L B U L L E T I N

**Biocitro<sup>®</sup> POWDER****Technical Product Noble Organic and Ecological  
Application in "Animal Nutrition" Prophylactic and Growth Promoter****Composition**

- Organic ecological compounds .....	50.00 %
- Ascorbic Acid and Ascorbates (Vit.C), with High level of Bioavailability, linked with Citrus Bioflavonoids (Vit.P) .....	4.00 to 7.20 %
- Unsaturated essential citrus fatty acids (Omega fatty acids:linoleic, linolenic, oleic) .....	0.80 to 1.60 %
- Hydrated glycerin linked with other traces of Citrus Polyphenols, Carbohydrates, Bio-flavoproteins, Pectin, Citrus Sugars, Citric Acid, Citric Salts and Biomass .....	30.00 to 35.00 %
- Water from constitution and crystallization .....	6.00 to 11.00 %
- Stabilizer and Inert carrier .....	50.00 % b/w

**Remarks**

Because of its make up, alterations in the original concentration of Biocitro<sup>POWDER</sup> may occur due to harvesting, weather, soil conditions etc.

**Raw materials of Biocitro<sup>POWDER</sup>**

- Citrus Grapefruit (Citrus Paradisi)
- Citrus Bergamot (Citrus Aurantium)
- Citrus Sweet Orange (Citrus Sinensis)
- Citrus Tangerine (Citrus Reticulata)
- Organic Acids
- Vegetal Glycerine
- Silicon Dioxide

**Mode of action of Biocitro<sup>POWDER</sup>**

The extended microbiostatic action of Biocitro<sup>POWDER</sup> is a result of combined effects of the synergism between Ascorbic Acid (vit. C), Citrus Bioflavonoids (vit. P), and the other organic acids contained in Biocitro<sup>POWDER</sup>.

The Antioxidant action of Biocitro<sup>POWDER</sup> is also a result of the synergism between Ascorbic Acid (vit. C), Citrus Bioflavonoids (vit. P) and Citric Acid. This Antioxidant action has powerful Beneficial Residual Antioxidant Action and Free Radical Scavengers.

**Bacteriostatic and fungistatic spectrum of Biocitro<sup>POWDER</sup>****BACTERIA**

Salmonella cholerae suis, Salmonella typhi, Salmonella anatum, Salmonella enteritidis, Salmonella gallinarum, Escherichia coli, Staphylococcus aureus, Staphylococcus faecalis, Klebsiella pneumoniae, Proteus mirabilis, Proteus vulgaris, Streptococcus faecium, Micrococcus spp, Pasteurella multocida, Pasteurella haemolytica, Clostridium perfringens, Clostridium sulfiredutores, Pseudomonas aeruginosa, Shigella dysenteriae.

**FUNGI**

Candida albicans, Penicillium spp, Penicillium funiculosum, Aspergillus flavus, Aspergillus oryzae, Mycosphaerella musicola, Mycosphaerella fijensis, Fusarium solani, Fusarium spp, Fusarium graminearum, Rhizoctonia solani, Alternaria solani, Phoma insidiosa, Colletotrichum lindemuthianum, Monilinia spp, Sclerotium rolfsii, Drechslera sorokiniana, Phyllosticta maytis, Nigrospora oryzae.

**Mutagenic and carcinogenic study of biocitro (testing in liquid version by xenometrix inc. - usa)**

Biocitro in liquid version was tested according to the latest techniques in Molecular Toxicology: Pro-Tox (c), Bacterial Stress Gene Assay; Cat-Tox (L), Human Liver Cell Stress Gene Assay; and Ames II (complete), Salmonella Mutagenesis Assay; by Toxicology Reference Laboratory Services "Xenometrix Inc", Denver - Colorado - USA.

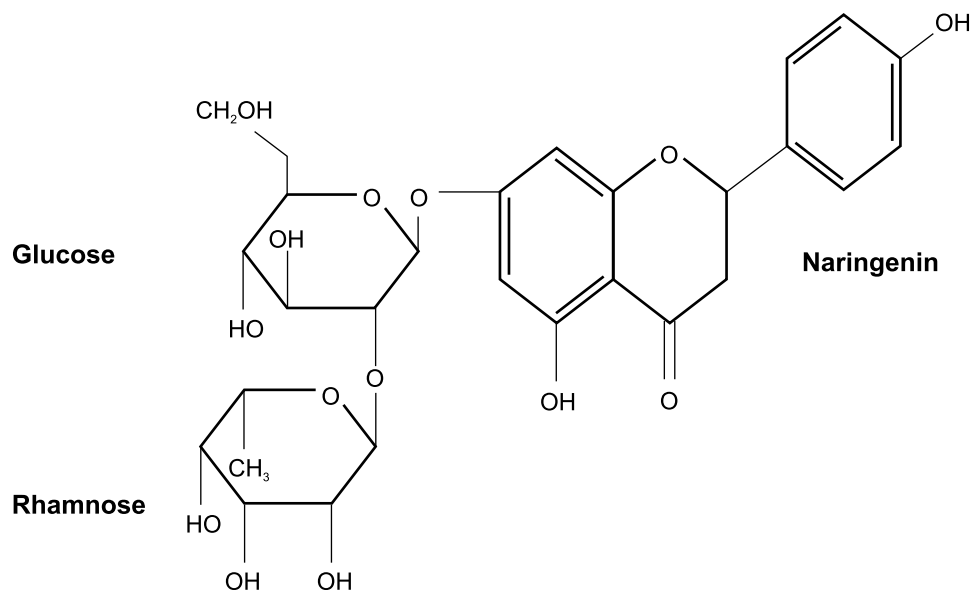
Conclusion: Biocitro doesn't affect DNA (Deoxyribonucleic Acid) which is the essential component of chromosomes in cell nucleus and the carrier of genetic information. Biocitro is non Mutagenic and non Carcinogenic.

**Technical information**

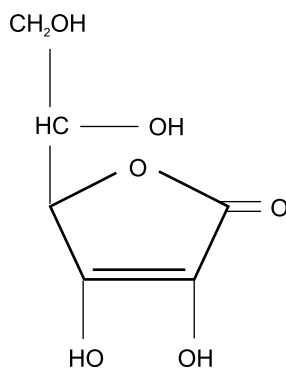
- Appearance and aspect:	Fine powder (80 to 120 mesh)
- Organoleptic characteristics:	- Taste: Bitter Acid and Adstringent (Citrus Bioflavonoids); - Odor: Agreeable (Light citrus smell); - Color: White to cream. With aging this changes to a dark creamy color but doesn't affect its efficacy.
- Density (g/ml at 25°C):	0,500 (± 10%).
- pH (10% dilution at 25°C):	2,75 (± 15%).
- Acidity (quantity of product mg neutralized by 1 ml of NaOH 1N):	1300 (± 15%).
- Ascorbic Acid (Vit. C) and Citrus Bioflavonoids (Vit. P) - Synergistic Association:	56000 ppm (± 25%).
- Naringin (Citrus Bioflavonoid from Grapefruit):	6500 ppm minimum.
- Nitrogen (Kjeldahl Method):	0,62% (± 15%).
- Solubility:	Water, Alcohol and Glycerin (Decanting the carrier - SiO <sub>2</sub> ).
- Corrosivity:	At 2000 ppm it is similar to potable water.
- pH to be mixed for use:	Better with products within the pH range 3.0 to 9.0
- Expiration:	Three (3) years after manufacturing date. Right closed drums.
- Stability:	- With aging its color changes to a dark creamy color but without affecting its efficacy. - Very stable at normal temperatures (4°C to 40°C): but above 120°C its stability is reduced. - Incompatible with <b>anionic products</b> . - Very stable under light.

## Chemical structure of main Biocitro<sup>LIQUID</sup> compounds

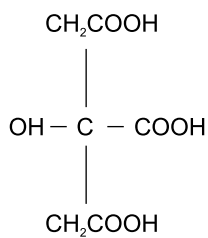
a) e.g. Glycoside Bioflavonoid - "Naringin" (C<sub>27</sub>H<sub>32</sub>O<sub>14</sub>) from "Grapefruit"



b) Ascorbic Acid (C<sub>6</sub>H<sub>8</sub>O<sub>6</sub>)



c) Citric Acid (C<sub>6</sub>H<sub>8</sub>O<sub>7</sub>)



D) Omega Fatty Acids e.g. Linoleic Acid (Essential fatty Acid)

**Noble biological properties of Biocitro<sup>POWDER</sup>**

- A) Biocitro<sup>POWDER</sup> is a phytopharmaco that improves the production of Organic Eggs and Poultry, Swine, Seafood Organic Meats.
- B) The continuous use of Biocitro<sup>POWDER</sup> in Animal Feed drastically reduces the use of antibiotics and chemotherapics such as prophylactics and growth promoters.
- C) Biocitro<sup>POWDER</sup> has Microbiostatic extended action that works in digestive tract of animals against Pathogenic bacteria and fungi, providing better absorption of nutrients and vitamins by monogastric animals.
- D) Biocitro<sup>POWDER</sup> has natural antioxidants (Ascorbic Acid, Citrus Bioflavonoids, Citric Acid) with a high level of bioavailability and excellent mutual working synergism and stability. Biocitro<sup>POWDER</sup> works primarily on the raw materials of animal feed and secondly sequestering internal free radicals that are the cause of much chronic chemical intoxication in the animals.
- E) The continuous field use of Biocitro<sup>POWDER</sup> by animals fed with Biocitro<sup>POWDER</sup> treated animal feed exhibit better organoleptic characteristics.
- Better natural taste
  - Better natural smell and
  - Better texture and pigmentation
- This noble property has a scientific-technical explanation: "Bioflavonoids and Ascorbic Acid affect enzymatic lipid peroxidation due to their enzyme inhibiting activity as well as non enzymatic lipid peroxidation due to their antioxidant properties, including free radical scavengers.
- F) Biocitro<sup>POWDER</sup> also has beneficial effects in protecting the liver of animals from intoxication caused by animal feed contaminated by Mycotoxins.
- G) Biocitro<sup>POWDER</sup> protects animal feed and meal from fungi and bacteria, preventing the formation of toxins (Enterotoxins and Mycotoxins). It permits animal feed and meal to remain uncontaminated for long time period of time while still retaining the original organoleptic qualities (good flavor and good taste), and stimulates the animal's appetite.
- H) The continuous use of Biocitro<sup>POWDER</sup> drastically reduces the mortality of young animals (Ex: chicks, pullets, piglets, etc.) which are mainly due to pathogenic contamination and intoxication by toxins (Mycotoxins and Enterotoxins).
- L) Biocitro<sup>POWDER</sup> contains Ascorbic Acid (vit.C) with a high level of bio-availability, thereby reducing stress caused by heating and/or cooling, mainly for confined monogastric animals.
- J) Biocitro<sup>POWDER</sup> doesn't sterilize the gastro-intestinal digestive system of the monogastric animals, but works, at the right dosage, as natural flora protector of digestive tract.
- K) Biocitro<sup>POWDER</sup> x Extract of Plants
- Biocitro<sup>POWDER</sup> works too with synergism when mixed with Extract of Plants that contain others Natural Polyphenols, Example:
    - Rosemary (Rosmarinus Officinalis L)  
Polyphenols: Rosmarinic Acid, Pinene, Cineol, Borneol and others;
    - Salvia (Salvia Officialis L)  
Polyphenols: Ursolic Acid, Oleanolic Acid, Rosmarimic Acid, Tannic Acid, Borneol, Cineol and others;
    - Cinnamon (Cinnamomum Zeylanicum Ness)  
Polyphenols: Cinnamic Acid, Eugenol, Vaniline, Cinnamic Aldehyde, Pinene, Cineol and others;
    - Oreganum (Origanum)  
Polyphenols: Thymol, Carvacrol, and others;
    - Green Tea  
Polyphenol: EGCG (Epigallocatechin);
    - Black Tea  
Polyphenol: Theaflavine;
    - Etc.

### Economical benefits of Biocitro<sup>POWDER</sup>

The logical consequence of the Noble Biological Properties of Biocitro<sup>POWDER</sup> brings excellent economical benefits, mainly for confined animals (poultry, swine, rabbits, fish and seafood, etc.):

- A) Biocitro<sup>POWDER</sup> improves the health of confined animals. It increases the production of Organic Meats and Eggs providing better organoleptic characteristics.
- B) Biocitro<sup>POWDER</sup> improves the health of confined animals, reducing or eliminating the prophylactic use of Antibiotics and chemotherapics.
- C) Biocitro<sup>POWDER</sup> increases the productivity of Poultry Stock Breeders, Commercial Laying Hens, and Broilers:
- Improves fertility and hatchability;
  - Increases egg yield;
  - Reduces mortality and diarrhea;
  - Improves Feed conversion;
  - Improves the quality of meat and eggs in terms of taste, shell, texture, pigmentation and shell durability.
- D) Biocitro<sup>POWDER</sup> increases the productivity of monogastric confined livestock (Swine, Rabbits, Weaning Piglets, calves, Colts, etc.):
- Improves fertility
  - Reduces diarrhea and mortality
  - Improves feed conversion
  - Improves the quality of meat (taste, smell, texture and pigmentation)
- E) Biocitro<sup>POWDER</sup> increases the productivity of farm fish and seafood:
- Reduces contamination and mortality;
  - Improves feed conversion;
  - Improves the quality of meat (taste, smell, texture and pigmentation).
- F) Biocitro<sup>POWDER</sup> protects animal feed and meals from nutritional efficacy decay and vitamin degradation while increasing the products shelf life.
- G) Biocitro<sup>POWDER</sup> can be used right up to the slaughtering of confined animals.

### Industrial characteristics of Biocitro<sup>POWDER</sup>

- A) The application of Biocitro<sup>POWDER</sup> to animal feed stuff needs to be carried out by Qualified Personnel in Animal Nutrition;
- B) Compatibility of Biocitro<sup>POWDER</sup>: It is recommended to use Biocitro<sup>POWDER</sup> without adding Chemotherapics or Antibiotics. If it is necessary to prepare medicated formulae (e.g. Feed Lunch) then qualified personnel need to understand that Biocitro<sup>POWDER</sup> combines synergistically with Antibiotics and appears to considerably broaden the Antibiotics spectrum of action;
- C) Biocitro<sup>POWDER</sup> is 100% Ecological and Biodegradable;
- D) Biocitro<sup>POWDER</sup> is Non Corrosive and Non Volatile;
- E) Biocitro<sup>POWDER</sup> is Non toxic to man, animals and vegetables;
- F) Biocitro<sup>POWDER</sup> has excellent Extended Action that increases the "shelf-Life" of Animal Feed or other formulas for Animal Nutrition and works as an excellent Feed Preservative preventing contamination by microorganisms and Toxins (Enterotoxins and Mycotoxins);
- G) Biocitro<sup>POWDER</sup> has efficacy in the presence of organic matter. It has a pH between 2,0 to 3,5 and it is effective at both Acid and Alkaline pH;
- H) Biocitro<sup>POWDER</sup> is compatible only with Non-Ionic and Cationic pharmacos;
- I) Biocitro<sup>POWDER</sup> has a fine powder form (80 120 mesh), an agreeable citrusodor, a bitter and astringent taste and a lemon-cream color;
- J) Biocitro<sup>POWDER</sup> can reduce the quantity of Antioxidants and other Pharmacos normally used in Animal Feeds and Animal Nutrition Formulas;
- K) Biocitro<sup>POWDER</sup> is an excellent Animal Meat Deodorizer which restores natural flavor and eliminates fetid odorous;

L) Precautions when using Biocitro<sup>POWDER</sup>:

- When handling Biocitro<sup>POWDER</sup> use the Personal Protection Equipment: eyeglasses, gloves, shoes, headgear, apron, etc.
- If accidental contact with the eyes occurs first wash with potable water and if the irritation continues, seek medical assistance.
- Empty packages must be stored and destroyed in accordance with the regulations for chemical products.

M) Instructions for Storing Biocitro<sup>POWDER</sup>:

- Keep the fiber drums containing Biocitro<sup>POWDER</sup> closed and in a dry fresh place.
- Keep the fiber drums out of reach of children and domestic animals.

**Dosage and how to use Biocitro<sup>POWDER</sup> in animal nutrition****Biocitro<sup>POWDER</sup> as a technical product:**

Due to the Broad Spectrum of Biocitro<sup>POWDER</sup> and the very low dosages used, its main use is as a technical product to formulate specific Animal Feed Additives, by using Biocitro<sup>POWDER</sup> alone or mixing mainly with Organic Acids (Ex: Fumaric Acid, Citric Acid, Lactic Acid, Formic Acid, Propionic Acid, etc.)

The following dosage was developed after the carrying out of many different trials at Universities and Research Institutions around the world.

Quinabra outlines here the Basic Dosages and due to the noble biological properties of Biocitro<sup>POWDER</sup>, the Animal Nutrition Technicians will develop their own uses and dosages, according to the local Livestock requirements.

**Basic dosages of Biocitro<sup>POWDER</sup>:**

- A) To increase the productivity of Poultry Parent Stock Breeders and Commercial Laying Hens: 150 grams of Biocitro<sup>POWDER</sup> /Ton of animal feed
- B) As a Prophylactic (diarrhea and intoxication) for young Chicks and Pullets: 150 to 200 grams of Biocitro<sup>POWDER</sup> / ton of animal feed
- C) As a Growth Promoter and Productivity Enhancement of Broilers: 100 to 120 grams of Biocitro<sup>POWDER</sup> / ton of animal feed
- D) Prophylactic (diarrhea and intoxication) for Weaning Piglets and Rabbits: 150 to 200 grams of Biocitro<sup>POWDER</sup> / ton of animal feed
- E) As a Growth Promoter and Productivity Enhancement of Swine and Rabbits: 100 to 120 grams of Biocitro<sup>POWDER</sup> / ton of animal feed
- F) As a prophylactic and Growth Promoter for Farm Fish, Shrimps and Seafood: 100 to 120 grams of Biocitro<sup>POWDER</sup> / ton of seafood feed.
- G) Prophylactic for Pets (Dogs, Cats, etc.): 100 to 150 grams of Biocitro<sup>POWDER</sup> / ton of animal feed
- H) As a Preserver of Animal Meal (Meat, Blood, Bones, Fish, etc.): 400 grams of Biocitro<sup>POWDER</sup> / ton of animal meal.
- I) As a Preserver of Commercial Animal Feed that remains several weeks in retail stores (animal feed for Birds, Dogs, Cats, Horses, etc.): 250 grams of Biocitro<sup>POWDER</sup> / ton of animal feed.

**References about Biocitro<sup>POWDER</sup> compounds (U.s. food & drug administration)**

According to the F.D.A. (Food & Drug Administration from the United States). CODE OF FEDERAL REGULATIONS, Part 182 "Substances Generally Recognized as Safe GRAS" 1<sup>st</sup>/April/1999 edition:

- Ascorbic Acid (Vit.C):	GRAS FDA 21-CFR-182.3013
- Citrus Extractives:	GRAS FDA 21-CFR-182.20
- Grapefruit (Citrus Paradisi)	
- Bergamot (Citrus Aurantium)	
- Tangerine (Citrus Reticulata)	
- Sweet Orange (Citrus Sinensis)	
- Citric Acid:	GRAS FDA-21-CFR-184.1033
- Citric Pectins:	GRAS FDA-21-CFR-184.1588

- Citric Sugars (Extractives):	GRAS FDA-21-CFR-182.20 and GRAS FDA-21-CFR 184.1866
- Vegetal Glycerin:	GRAS FDA-21-CFR-182.1320
- Fatty Acid:	GRAS FDA-21-CFR-184.1065
- Silicon Dioxide:	GRAS FDA-21-CFR-172480

### Ascorbic acid (vitamin c) with a higher level of bio-availability

The Ascorbic Acid (vitamin C) from Biocitro<sup>POWDER</sup> is very special, because the chemical link with Citrus Bioflavonoids (vitamin P) increases and improves its Bio-Availability and works at very low concentrations (ppm) due to its powerful synergism and excellent stability.

Vitamin C is a very important Vitamin for humans, animals and vegetables.

Ascorbic Acid (vit.C) is widely distributed in the plant and animal kingdom. Sources are: Citrus Fruits, hip berries, acerola, fresh tea leaves, etc.

Ascorbic Acid (vit.C) is used as an Antimicrobial and Antioxidant in foodstuffs, animal feed and vegetables.

Ascorbic Acid (vit.C) participates in Redox (Reduction and Oxidation) processes in the organism, being reversibly converted into dehydro-ascorbic acid with the release of hydrogen.

From recent investigations, it is to be assumed that Ascorbic Acid (vit.C) participates in enzymatically controlled hydroxylation reactions in Micro- somal Metabolism in the form of Semi-Dehydroascorbic Acid and in this manner exerts its various Physiological functions.

The high reducing power of Ascorbic Acid (vit.C) gives it the character of a stabilizer towards readily oxidizable substances (e.g. Adrenalin). Important metabolism relationships exist between Vitamin C and other Vitamins and Enzymes, and manifest themselves in different actions (e.g. Synergism or inhibition). The anti-infectious activity that is based in particular on the inactivation of toxins, is possibly connected with these reactions.

Due to its powerful reducing action, Ascorbic Acid (vit.C) is capable of substantially destroying the nitrites and nitrosating nitric oxide compounds widely found in foodstuffs, in drinking water, in animal feed and in the atmosphere and can thus restrict or prevent both endogenously and exogenously, the formation of the highly carcinogenic nitrosamines.

Due to QUINABRA's special process the Ascorbic Acid (Vit.C) of Biocitro<sup>POWDER</sup> provides excellent Stability and a High Level of Bio-availability, improving and increasing the use of Biocitro<sup>POWDER</sup> as an Antimicrobial and Antioxidant in situations where single Ascorbic Acid doesn't demonstrate good efficacy due its Quick Degradation and Oxidation.

### Citrus bioflavonoids (vitamin p)

Bioflavonoids are natural products widely found in the vegetal kingdom.

Bioflavonoids are natural Polyphenols naturally present in vegetables, fruits and beverages. High concentrates of Bioflavonoids can be obtained from all Citrus Fruits, rose hips, black currants and many other vegetables and fruits.

#### The main Bioflavonoids extracted from Citrus Fruits are:

- Naringin from grapefruit (Citrus Paradisi);
- Hesperedin from sweet orange (Citrus Sinensis);
- Tangeretin, Quercetin and Rutin from bergamot (Citrus aurantium) and tangerine (Citrus reticulata);
- Diosmin from lemon (Citrus limon) and lime (Citrus aurantifolia).

The Bioflavonoids contribute to the maintenance of normal blood vessel conditions by decreasing capillary permeability and fragility. Due to this noble quality, Bioflavonoids are classified Vitamin P.

#### Physiological benefits of Bioflavonoids:

##### A) Antioxidant Activity of Bioflavonoids:

- Bioflavonoids are strong Antioxidants and Free Radical Scavengers. Bioflavonoids can be Cytoprotectant in situations where oxidants or chemical radicals become injurious to the cell.

##### B) Cardiovascular Activity of Bioflavonoids:

- The vasoprotective properties of Bioflavonoids have been well known for a long time.
- Bioflavonoids can reduce the risk of death from coronary heart disease, due to their Antioxidant activity.
- Bioflavonoids reduces the influence of strong oxidants on the human cardiovascular system.
- Lower intake of Bioflavonoids results in higher risks of coronary diseases.

## C) Effects of Bioflavonoids on Lipid Peroxidation:

- Bioflavonoids affect enzymatic lipid peroxidation due to their enzyme inhibiting activity as well as non-enzymatic lipid peroxidation due to their Antioxidant properties.

## D) Anti-inflammatory Activity of Bioflavonoids:

- Due to their Antioxidant and Lipid Peroxidation inhibiting properties, Bioflavonoids are effective against inflammatory processes.
- Bioflavonoids have wound-healing effects and are useful in treating suppurative soft-tissue wounds.
- Bioflavonoids stimulate Phagocytosis, enzyme production, proteolysis and the removal of protein and edema fluid from injured tissues.

## E) Anticarcinogenic Activity of Bioflavonoids:

- Due to their Bioflavonoid content high consumption of vegetables and fruits is associated with reduced risk of cancer.
- Bioflavonoids act as antimutagenics and may have a role in the prevention of human and animal cancers. In addition Bioflavonoids enhance the effect of anti-tumor drugs.
- Bioflavonoids scavenge Free Radicals involved in cell damage and subsequent tumor development.

## F) Effects of Bioflavonoids on the Immune System:

- Bioflavonoids were found to strengthen the immune system, especially the gastrointestinal tract.

## G) Antiviral Activity of Bioflavonoids:

- Bioflavonoids are potent antiviral agents and they can affect the infectivity and replication of adenovirus, coronavirus and rotavirus in cell cultures.
- Bioflavonoids were used to treat the Influenza virus infection in mice.

## H) Anti-aging activity of Bioflavonoids:

- Bioflavonoids may have a role in inhibiting the aging process due to their antioxidant and cytoprotective properties.
- Bioflavonoids inhibit lipid peroxidation, which is also linked to the aging process in cells.

## I) Antibiotic and antifungal activities of Bioflavonoids:

- Bioflavonoids possess Antibiotic, Analgesic and Diuretic properties.
- Bioflavonoids exhibit antifungal activity against candida albicans fungi.

## J) General Safety of Bioflavonoids:

- Bioflavonoids are considered to be Non Toxic and Non Mutagenic.

### Synergism between Ascorbic Acid (vit.c) and Citrus Bioflavonoids (vit.p)

A) Due to the powerful Noble Antioxidant Mutual Action between Ascorbic Acid (vit.C) and Bioflavonoids (vit.P), this association demonstrates synergetic effects in the following activities Antioxidative, Antimicrobial, Immunological, Antiviral, Antiinflammatory, Anticarcinogenic, Anti-ageing, Cardiovascular and Lipid eroxidation;

B) Bioflavonoids reduce the oxidation injury to dermal fibroblasts. This action is enhanced by the presence of Ascorbic Acid (vit.C);

C) Ascorbic Acid and Bioflavonoids improve Enteric Immunity because they increase Phagocytosis;

D) Ascorbic Acid in synergism with Bioflavonoids has a triple beneficial effect, as: Cytoprotector, Vasoprotector and Immunostimulant, by improving and increasing the efficiency of the epithelium and intestinal capillaries in the nutrient absorption process; and also improving the oral absorption of Antibiotics and Chemotherapics (Ex. To prevent or control respiratory diseases in Poultry and Swines);

E) The synergetic action between Ascorbic Acid, Bioflavonoids, Bioflavoproteins and Omega Fatty Acids, improves the nutritional metabolism, acting as a regulator in Enzymes production (Ex. Pancreatic enzymes), and inhibiting the enzymatic peroxidation of lipids; thus improving protein digestibility;

F) Ascorbic Acid and Bioflavonoids work as well as Hepatoprotectors, protecting the hepatic cells against Micotoxins Intoxication;

G) Many international scientific studies have shown that the Antioxidant power of Bioflavonoids is 5(five) times that of Vitamin E. The Bioflavonoids in synergetic action with Ascorbic Acid and Citric Acid work sequestering Free Radicals. The meat of animals continuously fed with Biocitro<sup>POWDER</sup> has better organoleptic characteristics and quality (taste, smell, texture, pigmentation, free of exudation, and increased shelf life);

H) Bioflavonoids in combination with Ascorbic Acid (Vit.C) show synergistic effects in preserving the flavor of food, beverages, animal feed, etc;

I) Bioflavonoids protect Ascorbic Acid (Vit.C) from natural degradation and oxidation caused by moisture, air and light.

**References about Ascorbic Acid (vit.C) and Citrus Bioflavonoids (vit.P)**

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