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PATENT CO.'s pioneering PHYTOGENIC concept

From our early beginnings, one of our major strengths has been a focus on innovative and nature-based solutions.

Nowadays, Patent co. expertise is directed towards the development of:

Advanced mycotoxin control solutions **Phytogenics**

The advanced performance of our **mycotoxin control solutions** has been proven all over the globe for more than two decades. Our unique, patented technology brings superior characteristics to our products.

Patented technology which makes our products:

- very fast, in terms of adsorption speed
- stable, in terms of losing structure in different PH values
- highly selective, leaving all the vitamins, minerals, and amino acids in the food
- efficient, mycotoxin adsorption rate above 85%

Furthermore, our efforts and commitment to the safety of animals and humans has made us pioneers in the **PHYTOGENICS** field.

Natural alternative - PHYTOGENICS

From early beginnings one of our major strengths is focus innovative and natural based solutions. Our efforts and commitment to safety of animals and humans made us pioneers in the phytogenic field.

Phytogenics are a group of natural growth promoters (NGPs) or non-antibiotic growth promoters used as feed additives; derived from herbs, spices or other non-woody flowering plants known to have medicinal properties. They are commonly regarded as favorable alternatives to antibiotic growth promoters (AGPs) in livestock production. Essential oils represent a concentrated form of phytogenics, containing mainly the active ingredients of the plants.

Company Patent Co is pioneer in providing plant based solutions for sustainable livestock production worldwide. Our phytogenics represent carefully selected essential oils blends and other extracts of plants that mainly belong to genres of *Origanum spp.*, *Thymus spp.*, *Coriandrum spp.*, *Castanea spp.*, *Mentha spp.*, etc.

The most known mode of actions of our phytogenics' active ingredients are **Antimicrobial, Growth-promoting, Antioxidant and Prebiotic**, we like to shortly call AGAP phytogenic principles.

OUR PRODUCTS – PHYTOGENIC FEATURES

1. Patente Herba

Antibiotic properties are attributed to different plant active ingredients. For example, thymol and carvacrol proved to have negative effect on growth of *Brachyspira hyodysenteriae* (Vande Maele et. al 2016), causative agent of swine dysentery, as well as to **non-specific diarrheas**. Additional

antibiotic effects to Gram positive and Gram negative bacteria have also tannins, linalool, terpineol, eugenol, etc.

Growth promoting effects of phytochemicals are consequence of increased palatability of feed and increased digestibility due to stimulation of digestive fluids. Indirectly, less undigested feed in colon means that bacteria that normally lives there, *Brachyspira hyodysenteriae*, have less chance to survive.

Antioxidant activity of essential oils and other plant extracts showed to reduce diarrhea and prolonger feed stability.

Prebiotic feature of our phytochemicals is explained by presence of tannins which can serve as promoter of good microbiom (*Lactobacillus* spp.) growth in gastro-intestinal tract of pigs.

2. Patente Herba Plus

Two important ingredients combined and supplemented with essential oils are key to Patente Herba Plus advanced performance with persistent non-specific diarrhoea:

- **Lysozyme** (EC 3.2.1.17, muramidase) is peptide that occurs normally in different animal secretion and is considered as important component of the innate immune system (Zhang et al. 2006) Lysozyme digests bacterial cell walls by breaking β (1-4) glycosidic bonds between N-acetylmuramic acid (NAM) and N-acetylglucosamine (NAG) in peptidoglycan layers of bacterial wall. Synergistic antimicrobial effect of lysozyme and essential oils are reported (Hemaiswarya and Doble, 2009).

- **Nicotinamide**, active compound of vitamin B3 is considered to be a pharmacological agent or drug, when dietary requirement of nicotinamide is significantly exceeded.

Nicotinamide is an inexpensive and orally available agent without significant side effects with indirect antimicrobial effect due to specific immunomodulatory actions. In high dosage it is used to treat intracellular pathogen such as *Mycobacterium tuberculosis* (Murray, M. F. 2003).

3. RIDofMITE

Anti-acaricid properties are attributed to different plant active ingredients. For example, thymol, carvacrol, linalool and eucalyptol proved to have negative effect on poultry red mites population and reproductive cycle, thus to increased poultry health and welfare. Additional to anti-acaricid properties, antibiotic effects to Gram positive and Gram negative bacteria have also been shown by presence of tannins, terpineol, eugenol, etc.

Carbon dioxide (CO₂) decreasing emission in birds and litter effects of RIDofMITE product are consequence of increased feed palatability and increased digestibility, due to stimulation of digestive fluids in poultry. Also poultry red mite is highly attracted by feathers CO₂ odour as well as hens aggregation pheromones and kairomones which has been masked by natural approach of selected phytochemicals in form of RIDofMITE.

Antioxidant activity of used essential oils and other plant extracts showed to reduce the number of poultry red mite population in facilities, reduces anxiety and heat induced stress in birds.

Repellent feature of our phytochemical is explained by presence of thymol, carvacrol, linalool, eucalyptol and cobalamin, through decreasing the hens feathers CO₂ odour as well through the masking hens aggregation pheromones and kairomones sent making the hens unattractive food source for mites. On the other side, our phytochemical increase immune system, inhibits free radicals and enhance production of red blood cells and oxygen carrying protein.

For more information please contact us at export@patent-co.com

