

# Mechanism of Action

Many people have asked how healthymouth™ works. While each ingredient was selected for specific known properties, this does not fully explain the fabulous results obtained in each of the many clinical trials. So we composed the following memo.

TO: Our Colleagues

FROM: Karen Albert, Esq., W. Jean Dodds, DVM, Fraser Hale, DVM, FAVD, Dipl AVDC

## Synergism of Ingredients

An obvious question arises whenever people discuss **healthymouth™**, namely, "How do these products work?" People understandably would like to know specifics not only about the mechanism of action of each ingredient but also how they all work together. This question has been asked during the early development and studies of the products. The synergism achieved by the combination of ingredients used in **healthymouth™** can be directly addressed below:

Scientists and clinical researchers realize that many inventions and phenomena in science and medicine work synergistically and yet the mechanisms of this synergism are often poorly or never understood. Why they work and perform as they do is often not explainable, and yet the combination of two or more ingredients unexpectedly produces an enhanced effect and the end product works remarkably well. This reflects the classical pharmacologic definition of additivity. A well-known example is codeine mixed with acetaminophen or ibuprofen to enhance the action of both ingredients as pain relievers.

Many pharmaceutical agents and synthetic or 'industrial' chemicals have been subjected to intense study of their chemical, physical and pharmacokinetic properties. Therefore, the Mechanism of Action (MoA) is well-known and documented, both as they behave on their own, and in combination with other agents. Chlorhexidine gluconate, for instance, has been studied in great detail and the exact MoA is known at the molecular level. On the other hand,

there are many agents for which the specific MoA is either unknown or simply theorized. Then, when agents are combined, there are many examples of unexpected synergistic effects which defy explanation.

In veterinary medicine, a classical example is trimeprazine tartrate plus low dose prednisolone; Temaril-P (Pfizer), known for over 40 years as an anti-tussive, anti-pruritic and anti-inflammatory. This unique combination product allows for relief of pruritis, coughing and dermatoses with much lower doses than required with corticosteroids alone.

In the case of **healthymouth™**, this is not a drug formula, but a combination of natural ingredients that produce an enhanced effect when combined. The efficacy of the products has been clearly demonstrated by ten *in-vivo* clinical trials in dogs, cats and horses, and further Veterinary Oral Health Council (VOHC) Board Review and Acceptance.

HealthyMouth, LLC does not use pharmaceutical, synthetic or 'industrial' ingredients. Most of the ingredients are botanical extracts. Some of the ingredients have well-documented antioxidant properties; some have a long history of use in Chinese and Indian medicine as anti-inflammatory agents or for providing support to the immune system. Certainly the MoA of the vitamins (B12 and C) is no mystery, but precisely how cinnamon extract (for example) works may be harder to determine. Having said that, Wikipedia has entries for each ingredient and several have quite detailed explanations and/or links to references in the medical literature. However, the collection of ingredients has been combined in a unique way and so the MoA of the entire recipe with its ingredients acting together remains an open question.

The lack of an obvious explanation as to how **healthymouth™** products work is actually one of the great benefits of the recipes. In order for a product to receive patent protection, the applicant must demonstrate a "lack of obviousness". The fact that the actions of the

ingredients, when combined, are not obvious, was a factor in the formula receiving US Patent #8221727.

While we may all be curious regarding the MoA of **healthymouth™**, it really is an academic question. The questions of clinical relevance remain: "Is the product safe?" and "Does the product provide demonstrable benefit to the patient?" In the case of **healthymouth™**, the answer to both questions is a resounding "Yes!"

#### Safety

Regarding safety, Dr. W. Jean Dodds of Hemopet started giving **healthymouth™** water additive to her colony of healthy, rescued blood-donor greyhounds in 2008. These animals are monitored very closely for any health concerns and for the wholesomeness of their donations (blood). If Dr. Dodds had seen even a hint that **healthymouth™** was having a negative impact on even just one of her dogs, she would have ceased its use immediately. Furthermore, the product has had years of use in the field with no reported adverse effects.

#### Efficacy

**healthymouth™** has been subjected to multiple species-specific, *in vivo* clinical trials and each time the results have been very impressive (far in excess of the VOHC requirements even when trial durations were extended far beyond the required VOHC protocols). The strong evidence is that a reliable, reproducible and very definite benefit is derived from using **healthymouth™**.