

CREATING BRIGHTER LIVES, FOR THEM, FOR US.

**PET ESSENTIAL NUTRITION
QUARTERLY – Q1 2019**





THE HEALTH BENEFITS OF BETA-CAROTENE*

Beta-carotene is a powerful antioxidant and immune modulator. It is also a provitamin A in dogs. Beta-Carotene modulates both cellular and humoral immune responses. For example, beta-carotene increased plasma antibody concentration and enhanced the delayed-type hypersensitivity response in dogs.

KNOWN FUNCTIONALITY*:

- Quenches singlet oxygen
- Neutralizes free radicals
- Protects against oxidative damage
- Is a precursor of vitamin A (provitamin A)
- Acts in synergy with vitamin E and C
- Enhances certain immune responses



HOW ARE DSM PET INDUSTRY SPECIALIST STAYING CONNECTED TO OUR INDUSTRY?

On February 12th, DSM helped sponsor the 2019 Pet Food Conference at the International Production & Processing Expo in Atlanta, Georgia. At this event, we learned about various topics and issues that are affecting the Pet Food industry in the U.S., North America and the rest of the globe.

Jared Koerten from Euromonitor helped us understand emerging trends both domestically and globally. One of the most compelling trends that is driving growth across all pet food segments is in the online retail sector. With rapid growth predicted to continue through 2025, all the major pet food producers and retailers are noticing the impact of Chewy.com and Amazon.

Gina Tumbarello, from AFIA, updated attendees on Trade Policy and Outlook for 2019. With the current Trade War between the U.S. and China, there remains uncertainty in areas that are currently not involved in the Trade War, namely vitamins.

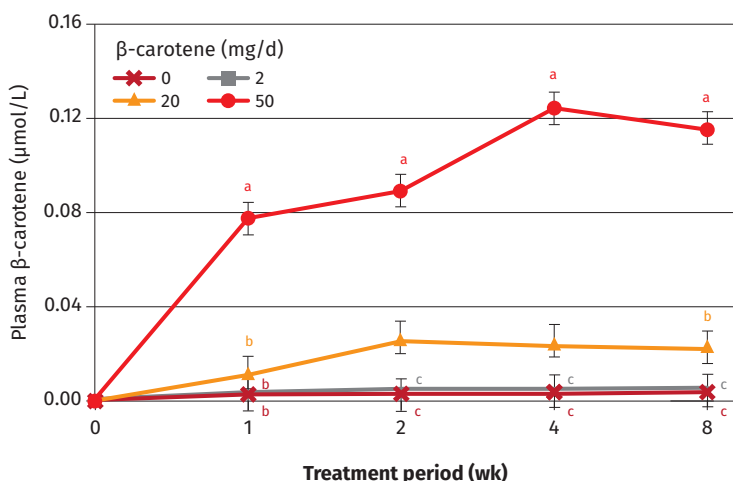
Overall, the Pet Food Conference was well attended with over 300 attendees (customers, suppliers, regulatory officials and industry experts) and was very informative with abundant opportunities to network and discuss DSM products.

Regards, William Turnipseed
Sr. Sales Manager, Pet Nutrition, NA

NOW CLAIMING NATURE'S DEFENSE FOR PETS!

While commercial pet foods may contain sufficient amounts of vitamin A, little attention has been given to dietary beta-carotene content. However, beta-carotene plays a significant endogenous antioxidative (cell protective) role in canine and feline nutrition. Endogenous cellular antioxidants support general good health and are linked to supporting risk management of many diseases connected with the aging process. There is also compelling evidence indicating beta-carotene restores immune responses in older dogs when compared with age-matched controls and younger counterparts.

Body absorption of beta-carotene is essential for its health benefits. Feeding studies have clearly demonstrated that dietary beta-carotene supplementation significantly increases plasma beta-carotene concentration in dogs and cats. For example, the results show beta-carotene is bioavailable in dogs.



Plasma β -carotene concentrations in dog fed diets containing 0, 2, 20 or 50 mg β -carotene for 8 wk. Values are means \pm SEM, n = 12-14. Means at a time with different superscripts differ significantly, P < 0.05.

J. Nutr. 130: 1910-1913, 2000

Another study shows that beta-carotene is bioavailable in cats (J. Nutr. 130: 2322-2325, 2000)

*These benefits are a representation of current human and animal science and are not intended as claims.

CONSUMER STUDIES SUPPORT LEVERAGING BETA-CAROTENE AND IMMUNE FUNCTION CLAIMS ON PET FOOD AND FUNCTIONAL SNACKS.

From a 2011 DSM commissioned MetrixLab U.S. consumer study, 64% of pet parents strongly agreed “Beta-carotene is a nutrient known to support healthy immune function.” while 60% strongly agreed “Beta-carotene supports a robust immune system.”. This is compelling evidence that pet foods and snacks containing beta-carotene provide pet parents who purchase pet nutritional products with the reason to believe in immune function claims.

Although referring to consumer behavior in general, industry analysts predict that consumer demand will drive the need for products that not only “Promote solutions to help consumers age well.” but also “Help consumers support their immune system” (as reported by Mintel in their “The Future of Vitamins and Supplements 2019” report). It is common for human nutrition trends to extend to pet foods, snacks, and dietary supplements.

One major challenge for pet food formulators is the instability of beta-carotene during processing and storage of the pet food. Although the standard DSM Carotenoids beta-Carotene 10% beadlet and beta-Carotene 1% CWS/M (cold water soluble) forms are high quality sources of beta-carotene; beta-Carotene 10% P is specifically engineered to be more stable during the processing and storage of dry extruded pet foods and snacks. This more stable form helps pet product brand owners to make quantitative label claims, expected of super-premium pet food brands.

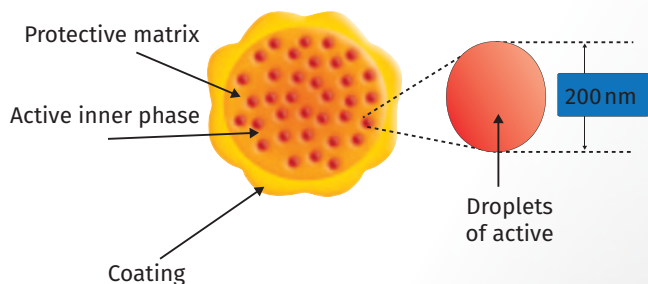
DSM OFFERS DIFFERENT FORMS OF BETA-CAROTENE TO MEET THE NEEDS OF A VARIETY OF PET NUTRITIONAL PRODUCT APPLICATIONS:

DSM CAROTENOIDS BETA-CAROTENE 10% (STANDARD BEADLET)

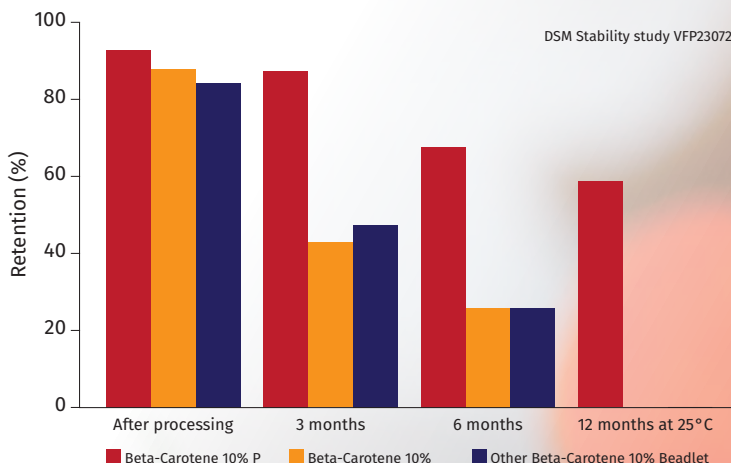
DSM CAROTENOIDS BETA-CAROTENE 1% CWS/M (COLD WATER SOLUBLE)

DSM CAROTENOIDS BETA-CAROTENE 10% P (EXTRUSION STABLE BEADLET)

For superior stability in dry extruded pet foods and snacks, DSM uses a cross-linked beadlet technology to achieve stability through product manufacturing and storage



DSM Carotenoids beta-carotene 10% P stability in dry pet food compared to alternative standard beadlet forms of beta-carotene



The added stability of DSM Carotenoids beta-Carotene 10% P makes it possible to guarantee the level of beta-carotene on the label of dry, extruded pet foods and functional snacks.

