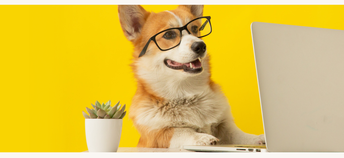
Dogs & Aging

July 14, 2024



Welcome to Issue 94 of Science Says! Our weekly newsletter where you'll learn the latest healthy aging and C15:0 research news that our team of doctors, scientists, and experts are most excited about—without having to go search for it.

Eric and Steph
Co-Founders, Doctors, Nerds

What Dr. Stephanie Venn-Watson, our co-founder and author of over 80 peer-reviewed scientific publications, is reading.

HEALTHY AGING

How to slow aging in dogs

While we usually talk about healthy aging in humans here at *Science Says!*, over the next two weeks, we're covering how we can apply the science behind healthy aging to our most faithful furry friends. This one's for Rover.

Do dogs age like us?

Indeed! As shared by McKenzie et al., older dogs share many of the same aging-related changes that we do. This includes development of:

- Heart disease
- Cancer
- Cognitive decline
- Muscle loss
- Osteoarthritis
- Cataracts
- Gray hair

The leading causes of mortality in dogs closely align with ours: cancer, heart disease, and degenerative neurologic or musculoskeletal disease.

If we can slow cellular aging in humans, can we do the same for dogs?

Common sense (and science) says, yes. Here are a couple of key tenets of age- and longevity-driving mechanisms shared between humans and dogs:

- **Dusty and damaged DNA shortens longevity.** Wang et al. found that humans and dogs share a common biological clock, in which the more "dusty" (aka methylated) our DNA, the more we have physically aged. Further, Jimenez et al. showed that shorter-lifespan dogs (aka larger dogs) have more DNA damage even as puppies, a key hallmark of aging in humans. As such, if we can slow DNA damage, we can slow aging in humans and dogs.
- **Restricted calories extend longevity.** Restricting how many calories we eat is a well-established means to activate what's called the "Longevity Regulatory Pathway". The less calories we eat, the more we activate longevity-enabling pathways, the longer we live. This includes turning down IGF-1 and mTOR. As described by Sandor et al., this all appears to hold true for dogs, too. In fact, Bray et al. showed that dogs restricted to once-daily feedings have better overall health, including better cognitive, GI, dental, orthopedic, and liver health.

This all means that the same advances we are making to support healthy aging in humans will likely help dogs live longer and healthier, too.

Why do smaller dogs live longer?

While it has long been understood that smaller dogs live longer than bigger dogs, until recently it had not been confirmed whether this was due to specific breeds or truly due to body size. In their recent paper, Da Silva et al. showed that indeed, body size matters.

Specifically, they started with dogs' wild ancestor: the gray wolf. From there, they showed that smaller size dogs resulted in longer lifespans than wolves. Conversely, larger dogs had shorter lifespans. Further, Da Silva et al. showed that along with larger-sized dogs comes an evolutionary-tied increased risk of cancer - and it's primarily cancer that shortens the lifespans of the largest dogs.

In summary, finding ways to slow the onset of heart disease, cancer, cognitive decline, muscle loss, and arthritis will have a meaningful impact on helping our dogs (and us) live longer, healthier lives.

Dogs & Humans: Common healthy aging benefits of C15:0

Next week, we'll cover the emerging science behind how C15:0 supports healthy aging, not only in humans but dogs, too! This includes how C15:0 is linked to the following in dogs:

- Better muscle health
- Better gut health
- Better joint health
- Better heart health

Until then, Sit. Stay. Relax. And have a great week, everyone!

Dive deeper into the science

READ THESE STUDIES

- McKenzie et al. The phenotype of aging in the dog: How aging impacts the health and well-being of dogs and their caregivers.
- Wang et al. Quantitative translation of dog-to-human aging by conserved remodeling of the DNA methylome.
- Jimenez et al. Cellular metabolism and oxidative stress as a possible determinant for longevity in small breed and large breed dogs.
- Sandor et al. Genetic pathways of aging and their relevance in the dog as a natural model of human aging.
- Bray et al. Once-daily feeding is associated with better health in companion dogs: results from the Dog Aging Project.
- Da Silva et al. Dog life spans and the evolution of aging.
- Venn-Watson S. The Cellular Stability Hypothesis: Evidence of Ferroptosis and Accelerated Aging-Associated Diseases as Newly Identified Nutritional Pentadecanoic Acid (C15:0) Deficiency Syndrome. Metabolites. 2024; 14(7):355.
- Nerd out on all the C15:0 science at DiscoverC15.com.