Scientists have come up with a better way to convert your dog’s age to human years
Researchers say the seven-to-one rule falls short, and turn to Tom Hanks and a Labrador retriever to show us how

By Christopher Ingraham

November 28, 2019 at 7:00 a.m. CST

My dog Winston, a 1-year-old pit bull mix, is a sleek, muscular beast at the peak of his physical abilities.

According to the well-known rule by which we convert one dog year into seven human years, Winston is about the same developmental age as my 6-year-old twins. But in contrast to Winston’s athleticism, the twins are clumsy, cuddly little goofballs with a lot of growing up to do.

Now, new research by a team of geneticists and biologists at the University of California, San Diego and elsewhere explains the discrepancy. The scientists say they’ve devised a far more accurate formula for the human-canine conversion — one that front-loads the aging process for dogs and accounts for such variables as breed size — by boring into the effects of aging on their respective DNAs.
By their calculation, Winston isn’t 7; he’s pushing 30.

People have been interested in converting dog years into human years since at least the 13th century. An inscription in London’s Westminster Abbey from the year 1268 uses a dog year calculation as a steppingstone in a prediction of the end of the world:

If the reader wisely considers all that is laid down, he will find here the end of the primum mobile; a hedge (lives for) three years, add dogs and horses and men, stags and ravens, eagles, enormous whales, the world: each one following triples the years of the one before.

Dogs live for nine years on average, or three times the life of a hedge, while the human life span works out to nine times the life of a dog, or 81 years. The calculation assigns our 4.5 billion-year-old planet a life span of 19,683 years, a discrepancy that gives some sense of the accuracy of the whole endeavor.

The next big innovation in dog math didn’t arrive until the mid-20th century, when the seven-to-one rule became widespread for reasons that aren’t entirely clear, but which probably had to do with the simple fact that human life expectancy at the time was about 70 years, while dogs lived to be about 10.
It was clear from the get-go that the formula is overly simplistic. Dogs mature faster than people: They can produce their first litter of puppies before they’re a year old, while the typical human 7-year-old is still years away from puberty.

There’s also the problem of radically different life spans: Small dogs like the Cairn Terrier can expect to live twice as long (14 years) as a large breed like the Great Dane (7 years).

Acknowledging these realities, the American Kennel Club offers a dog-year conversion table on its website that front-ends the aging process and accounts for dog size. By this calculation, Winston is approaching 15 in human years, which makes more intuitive sense. But can that conversion be improved?
The UCSD team thinks so. Their work zeroed in on a process called methylation, which reflects the chemical changes happening in a creature’s DNA as it ages.

The researchers collected DNA samples from 104 Labrador retrievers over a 16-year period. They compared changes in their DNA samples against DNA previously collected from 320 humans between the ages of 1 and 103.

They specifically looked for similarities in the methylation process between the two sets and found that the DNA profiles evolved in similar ways across the life span of both species. “If you look at the methylomes of 2-year-old Labs and you ask what are the closest human methylomes? The answer is that the best matches are in humans about 40 years old,” said UCSD’s Trey Ideker, the leader of the laboratory running the study. “That is just what the data show, no more, no less.”

Plot the two DNA profiles against each other and you get a curve showing the relationship between dog years and human years. Since Labrador retrievers are perhaps the most universally loved breed of dog, Ideker and the team illustrated their findings using the human equivalent: Tom Hanks.

According to the DNA analysis, a 1-year-old Lab is equivalent to a “Big”-era Hanks, while a 4-year-old mirrors the actor’s star turn in “The Da Vinci Code.” By age 9, a Lab has obtained the approximate gravitas of Hanks starring as Ben Bradlee in “The Post.”

The study’s dog-year equation front-loads even more of a dog’s developmental aging into its first year. That’s readily apparent when compared with the more linear
into its first year. That’s readily apparent when compared with the more linear approaches of the other estimates.

In the new equation, a 2-year-old Lab is the same genetic age as a 41-year-old human. If you’ve ever watched a young dog sprint across a field in a matter of seconds you may question whether this comparison is any more accurate than previous ones.

When this question was posed to Ideker via email, he asked if I was “implying that a 40 year old is not energetic??!?!? This 47 year old begs to differ. Rather than get depressed that your 2 year old dog is a 40 year old human — why not rejoice that your 40 year old human is a 2 year old dog!”

On a more serious note, he said that those figures were simply what the DNA analysis showed. “This molecular characterization may or may not capture the entire
showed. “This molecular characterization may or may not capture the entire experience of aging,” he added. “Our curve is based on one particular molecular measurement, albeit the first really quantitative one. But this story is clearly just beginning — the full verdict on dog-human aging is definitely not yet in and likely will not be for some time.”

Christopher Ingraham
Christopher Ingraham writes about all things data. He previously worked at the Brookings Institution and the Pew Research Center. Follow