Curves in all the right places

September 6 2017

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Researchers from the University of Liverpool collaborating with University College London, Banfield Pet Hospitals and the WALTHAM Centre for Pet Nutrition have developed the first evidence-based growth standards chart for dogs.

Evidence based growth charts are important tools for practice when assessing and monitoring growth in human infancy and childhood.

The pattern of growth for the individual child can be compared to the representative population measurements on the chart. But what about in dogs?

Tall or short, stocky or long legged. Dogs come in all shapes and sizes, each special in their own way, but do they all grow at the same rate?

Big Data

At Banfield Pet Hospitals - Mars Petcare's 975 veterinary clinics across the USA - dogs' weights are routinely recorded as part of general health checks. This is especially important during puppyhood when the pets' weight is rapidly changing. The researchers developing the growth standards chart for dogs had access to the historical health records of over six million dogs visiting Banfield hospitals over the past few years.

Statistics experts refined the data until they were left with measurements from 50,000 dogs that met a list of stringent criteria, including being under three years of age, in ideal body condition and with no health complaints. This important step means that the resulting curves represent a "growth standard" for dogs (describing the growth of 'healthy' pets, and intended to represent an ideal), rather than simply a "growth reference" (describing the growth of a defined population but making no inference as to their health).

Breed

The researchers then began by grouping dogs by breed, but for many of the less popular varieties there weren't enough dogs in the list to generate

breed-specific curves. On further analysis of the data, the scientists concluded that dogs of various breeds with a similar adult weight had a tendency to grow at the same rate as one another.

They then grouped the dog data into five weight ranges and created curves that followed the growth rate for dogs in those ranges. This size-category approach made the curves suitable for more than just the breeds initially included and, crucially, also to mixed-breed dogs.

The data showed that male and female dogs grow at different rates, with males growing more rapidly than their female counterparts. Separate male and female curves for each weight range were created to account for this difference.

Neutering

The detailed health records also allowed researchers to study the impact of neutering on growth rate. They found that neutering before 37 weeks of age was associated with a slight increase in the rate of growth, whilst neutering after 37 weeks was associated with a slight slowing of the growth rate. However, these changes were small enough to conclude that separate curves for neutered dogs were not needed.

The full study has been published by the journal *PLOS ONE*.

Alex German, Professor of Small Animal Medicine at University of Liverpool, said: "The growth phase is fundamental to the lifelong health and wellbeing of dogs.

"Growth standards for babies and children have become an essential component of the human paediatric tool kit but until now there's been limited information available on what constitutes optimal growth in dogs. This is a real step forward"

Ahead of the curve

The WALTHAM Puppy Growth Charts are available to UK puppy owners through their veterinary practice. The charts allow pet owners to partner with their vet to track their dog's growth and rapidly spot any problems.

Professor German adds: "If veterinary professionals can ensure that more dogs are in optimal body condition upon entering early adulthood, this will help to promote the maintenance of a healthy weight through lifelong, regular weight monitoring."

More information: Carina Salt et al, Growth standard charts for monitoring bodyweight in dogs of different sizes, *PLOS ONE* (2017). DOI: 10.1371/journal.pone.0182064

Provided by University of Liverpool