Longevity of Purebred Dog Breeds

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Abstract

Body mass is a very significant factor for influencing longevity. Generally, large animal species tend to live longer than small species. In domestic dogs, the relationship between body size and lifespan shows opposite trend and increasing bodyweight is negatively correlated with longevity. Crossbred dogs have increased longevity, compared with purebreds. In the Cane Corso Italiano breed, a relationship between longevity and hair colour was found for the first time in mammals.

Understanding longevity and aging across species and individuals is critical for reaching higher ages at death in animals, as well as in humans. By understanding genetics, the age limits of animals and humans can be significantly prolonged. Detection and analysis of genes associated with longevity present a very promising method for prolonging life.

Body mass is a very significant factor for influencing longevity. Generally, large animal species tend to live longer than small species [1,2]. This rule has some exceptions. In domestic dogs, the relationship between body size and lifespan shows the opposite trend, and increasing bodyweight is negatively correlated with longevity [3,4]. A negative correlation has also been observed between height and longevity [5]. The lifespan of most dog breeds has already been described in the past [3,4]. Cane Corso is the last dog breed in which their lifespan was determined [6]. Breed – specific age at death is shown in Table 1.

Table 1: Longevity of Purebred Dog Breeds.

| Breed Name               | Median Longevity (Years) | Breed Weight Group** | Source     |
|--------------------------|--------------------------|----------------------|------------|
| Affen pinscher           | 11,42                    | 2                    | Adams (2010)|
| Afghan hound             | 11,92                    | 4                    | Adams (2010)|
| Airedale terrier         | 10,75                    | 3                    | Adams (2010)|
| Akita                    | 9,92                     | 4                    | Adams (2010)|
| Alaskan malamute         | 10,71                    | 3                    | Adams (2010)|
| American cocker spaniel  | 10,33                    | 3                    | Adams (2010)|
| Anatolian/Karabash       | 10,75                    | 4                    | Adams (2010)|
| Australian cattle dog    | 11,67                    | 3                    | Adams (2010)|
| Australian shepherd      | 9                        | 3                    | Adams (2010)|
| Australian silky terrier | 14,25                    | 1                    | Adams (2010)|
| Australian terrier       | 12,08                    | 1                    | Adams (2010)|
| Basenji                  | 13,54                    | 2                    | Adams (2010)|
| Basset Fauve de Bretagne | 10,42                    | 3                    | Adams (2010)|
| Basset griffon vendeen   | 12,04                    | 3                    | Adams (2010)|
| Basset hound             | 11,29                    | 3                    | Adams (2010)|
| Beagle                   | 12,67                    | 2                    | Adams (2010)|
| Bearded collie           | 13,5                     | 3                    | Adams (2010)|
| Bearded collie           | 13,7                     | 3                    | O’Neil (2013)|
| Bedlington terrier       | 13,38                    | 2                    | Adams (2010)|
| Belgian shepherd         | 12,5                     | 4                    | Adams (2010)|
| Bernese mountain dog     | 8                        | 4                    | Adams (2010)|
| Bichon frise             | 12,92                    | 1                    | Adams (2010)|
| Breed Name              | Median Longevity (Years) | Breed Weight Group** | Source       |
|-------------------------|--------------------------|----------------------|--------------|
| Bichon frise            | 12.7                     | 1                    | O’Neil (2013) |
| Bloodhound              | 6.79                     | 5                    | Adams (2010)  |
| Border collie           | 12.25                    | 3                    | Adams (2010)  |
| Border collie           | 13.5                     | 3                    | O’Neil (2013) |
| Border terrier          | 1.4                      | 2                    | Adams (2010)  |
| Border terrier          | 12                      | 2                    | O’Neil (2013) |
| Borzoi                  | 9.08                     | 4                    | Adams (2010)  |
| Boston terrier          | 10.92                    | 2                    | Adams (2010)  |
| Bouvier des flandres    | 11.33                    | 4                    | Adams (2010)  |
| Boxer                   | 10.25                    | 4                    | Adams (2010)  |
| Boxer                   | 10                       | 4                    | O’Neil (2013) |
| Briard                  | 11.17                    | 4                    | Adams (2010)  |
| Brittany                | 12.88                    | 3                    | Adams (2010)  |
| Bull terrier            | 10                       | 3                    | Adams (2010)  |
| Bull terrier            | 11.2                     | 3                    | O’Neil (2013) |
| Bulldog                 | 6.29                     | 3                    | Adams (2010)  |
| Bulldog                 | 8.4                      | 3                    | O’Neil (2013) |
| Bullmastiff             | 7.46                     | 4                    | Adams (2010)  |
| Cairn terrier           | 14                       | 2                    | Adams (2010)  |
| Cairn terrier           | 13.4                     | 2                    | O’Neil (2013) |
| Canaan dog              | 14.63                    | 3                    | Adams (2010)  |
| Cane corso italiano     | 9.29                     | 4                    | Korec (2017)  |
| Cavalier king charles spaniel | 11.38              | 2                    | Adams (2010)  |
| Cavalier king charles spaniel | 9.9                | 2                    | O’Neil (2013) |
| Cesky terrier           | 8.42                     | 2                    | Adams (2010)  |
| Clumber spaniel         | 10.33                    | 4                    | Adams (2010)  |
| Cocker spaniel          | 11.17                    | 3                    | Adams (2010)  |
| Cocker spaniel          | 11.5                     | 3                    | O’Neil (2013) |
| Collie                  | 12.67                    | 3                    | Adams (2010)  |
| Curly coated retriever  | 10.75                    | 4                    | Adams (2010)  |
| Dachshund               | 12.67                    | 2                    | Adams (2010)  |
| Dalmatian               | 12.5                     | 4                    | Adams (2010)  |
| Dalmatian               | 13.3                     | 4                    | O’Neil (2013) |
| Dandie Dinmont terrier  | 12.17                    | 2                    | Adams (2010)  |
| Deerhound               | 8.67                     | 5                    | Adams (2010)  |
| Dobermann               | 9.2                      | 4                    | O’Neil (2013) |
| Dobermann               | 10.5                     | 4                    | Adams (2010)  |
| Dogue de Bordeaux       | 3.83                     | 4                    | Adams (2010)  |
| Dogue de Bordeaux       | 5.5                      | 4                    | O’Neil (2013) |
| English setter          | 11.58                    | 4                    | Adams (2010)  |
| English springer spaniel| 12                       | 3                    | Adams (2010)  |
| English springer spaniel| 13.3                     | 3                    | O’Neil (2013) |
| English toy terrier     | 12                       | 1                    | Adams (2010)  |
| Estrela mountain        | 9.75                     | 3                    | Adams (2010)  |
| Field spaniel           | 11.63                    | 3                    | Adams (2010)  |
| Finnish lapphund        | 7.33                     | 2                    | Adams (2010)  |
| Finnish spitz           | 11.13                    | 3                    | Adams (2010)  |
| Breed Name                  | Median Longevity (Years) | Breed Weight Group** | Source       |
|----------------------------|--------------------------|----------------------|--------------|
| Flat-coated retriever      | 9.83                     | 4                    | Adams (2010) |
| Fox terrier                | 13.13                    | 2                    | Adams (2010) |
| French bulldog             | 9                        | 2                    | Adams (2010) |
| German longhaired pointer  | 10.5                     | 3                    | Adams (2010) |
| German pinscher            | 11.38                    | 2                    | Adams (2010) |
| German shepherd dog        | 11                       | 4                    | O’Neil (2013) |
| German shorthaired pointer | 12                       | 4                    | Adams (2010) |
| German spitz               | 11.33                    | 2                    | Adams (2010) |
| German wirehaired pointer  | 10                       | 4                    | Adams (2010) |
| Giant schnauzer            | 10                       | 4                    | Adams (2010) |
| Glen of imaal terrier      | 10.42                    | 3                    | Adams (2010) |
| Golden retriever           | 12.25                    | 4                    | Adams (2010) |
| Golden retriever           | 12.5                     | 4                    | O’Neil (2013) |
| Gordon setter              | 11.08                    | 3                    | Adams (2010) |
| Grand bleu de gascoigne    | 4.54                     | 3                    | Adams (2010) |
| Great dane                 | 6.5                      | 5                    | Adams (2010) |
| Great dane                 | 6                        | 5                    | O’Neil (2013) |
| Greenland dog              | 8.46                     | 3                    | Adams (2010) |
| Grey hound                 | 9.08                     | 4                    | Adams (2010) |
| Grey hound                 | 10.8                     | 4                    | O’Neil (2013) |
| Griffin bruxellois         | 12                       | 1                    | Adams (2010) |
| Hamilton stovare           | 10.13                    | 3                    | Adams (2010) |
| Havanese                   | 10.25                    | 3                    | Adams (2010) |
| Hovawart                   | 12.92                    | 3                    | Adams (2010) |
| Hungarian puli             | 12.42                    | 3                    | Adams (2010) |
| Hungarian vizsla           | 12.92                    | 3                    | Adams (2010) |
| Hungarian wirehaired vizsla| 9.83                     | 3                    | Adams (2010) |
| Chesapeake bay retriever   | 10.75                    | 3                    | Adams (2010) |
| Chihuahua                  | 12.42                    | 1                    | Adams (2010) |
| Chihuahua                  | 7.1                      | 1                    | O’Neil (2013) |
| Chinese crested            | 10.08                    | 3                    | Adams (2010) |
| Chow chow                  | 9.38                     | 3                    | Adams (2010) |
| Irish red & white setter   | 11.42                    | 3                    | Adams (2010) |
| Irish setter               | 12                       | 4                    | Adams (2010) |
| Irish terrier              | 14.83                    | 2                    | Adams (2010) |
| Irish water spaniel        | 9.33                     | 4                    | Adams (2010) |
| Irish wolfhound            | 7.04                     | 5                    | Adams (2010) |
| Italian greyhound          | 13.5                     | 1                    | Adams (2010) |
| Italian spinone            | 9                        | 4                    | Adams (2010) |
| Jack russell terrier       | 13.4                     | 2                    | O’Neil (2013) |
| Japanese chin              | 9.25                     | 1                    | Adams (2010) |
| Japanese spitz             | 12.29                    | 1                    | Adams (2010) |
| Keeshond                   | 12.21                    | 3                    | Adams (2010) |
| Kerry Blue terrier         | 11.5                     | 3                    | Adams (2010) |
| King charles spaniel       | 10.04                    | 2                    | Adams (2010) |
| King charles spaniel       | 12                       | 2                    | O’Neil (2013) |
| Komondor                   | 9.13                     | 5                    | Adams (2010) |
| Breed Name                  | Median Longevity (Years) | Breed Weight Group** | Source       |
|-----------------------------|--------------------------|----------------------|--------------|
| Kooikerhondje               | 3.92                     | 3                    | Adams (2010) |
| Labrador retriever          | 12.25                    | 4                    | Adams (2010) |
| Labrador retriever          | 12.5                     | 4                    | O’Neil (2013) |
| Lakeland terrier            | 15.46                    | 2                    | Adams (2010) |
| Lancashire heeler           | 11.75                    | 2                    | Adams (2010) |
| Large munsterlander         | 11.33                    | 4                    | Adams (2010) |
| Leonberger                  | 7.08                     | 5                    | Adams (2010) |
| Lhasa apso                  | 13                       | 2                    | O’Neil (2013) |
| Lhasa apso                  | 14.33                    | 2                    | Adams (2010) |
| Lowchen                     | 10                       | 1                    | Adams (2010) |
| Maltese                     | 12.25                    | 1                    | Adams (2010) |
| Manchester terrier          | 12.83                    | 1                    | Adams (2010) |
| Maremma sheepdog            | 10                       | 4                    | Adams (2010) |
| Mastiff                     | 6.83                     | 5                    | Adams (2010) |
| Mastiff                     | 7.1                      | 5                    | O’Neil (2013) |
| Miniature bull terrier      | 6.08                     | 2                    | Adams (2010) |
| Miniature dachshund         | 13.5                     | 1                    | O’Neil (2013) |
| Miniature pinscher          | 13                       | 1                    | Adams (2010) |
| Miniature poodle            | 13.92                    | 2                    | Adams (2010) |
| Miniature poodle            | 14.2                     | 2                    | O’Neil (2013) |
| Miniature schnauzer         | 12.08                    | 2                    | Adams (2010) |
| Neapolitan mastiff          | 2.33                     | 4                    | Adams (2010) |
| Newfoundland                | 9.67                     | 5                    | Adams (2010) |
| Norfolk terrier             | 11                       | 2                    | Adams (2010) |
| Norwegian buhund            | 12.67                    | 2                    | Adams (2010) |
| Norwegian elkhound          | 13.17                    | 3                    | Adams (2010) |
| Norwich terrier             | 13.38                    | 2                    | Adams (2010) |
| Nova Scotia duck tolling retriever | 8                  | 3                    | Adams (2010) |
| Old english sheepdog        | 10.75                    | 4                    | Adams (2010) |
| Otterhound                  | 10.21                    | 4                    | Adams (2010) |
| Papillon/Butterfly dog      | 13.08                    | 1                    | Adams (2010) |
| Parson russell terrier      | 13                       | 2                    | Adams (2010) |
| Pekingese                   | 11.42                    | 1                    | Adams (2010) |
| Pharaoh hound               | 11.83                    | 3                    | Adams (2010) |
| Pointer                     | 12.42                    | 3                    | Adams (2010) |
| Polish lowland sheepdog     | 9.58                     | 3                    | Adams (2010) |
| Pomeranian                  | 9.67                     | 1                    | Adams (2010) |
| Portuguese water dog        | 11.42                    | 3                    | Adams (2010) |
| Pug                         | 11                       | 2                    | Adams (2010) |
| Pyrenean mountain dog       | 9.58                     | 5                    | Adams (2010) |
| Pyrenean sheepdog           | 5.79                     | 4                    | Adams (2010) |
| Rhodesian ridgeback         | 11                       | 4                    | Adams (2010) |
| Rottweiler                  | 8.92                     | 4                    | Adams (2010) |
| Rottweiler                  | 8                        | 4                    | O’Neil (2013) |
| Rough collie                | 12                       | 3                    | O’Neil (2013) |
| Russian black terrier       | 1.79                     | 3                    | Adams (2010) |
| Saluki/gazelle hound        | 12                       | 4                    | Adams (2010) |
### Breed Name | Median Longevity (Years) | Breed Weight Group** | Source
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Samoyed | 12.5 | 4 | Adams (2010)
Scottish terrier | 10.25 | 2 | Adams (2010)
Scottish terrier | 12 | 2 | O’Neil (2013)
Sealyham terrier | 12.25 | 2 | Adams (2010)
Shar pei | 6.29 | 3 | Adams (2010)
Shetland sheepdog | 12.5 | 2 | Adams (2010)
Shetland sheepdog | 12.5 | 2 | O’Neil (2013)
Shiba Inu (Japanese) | 7 | 2 | Adams (2010)
Shih-tzu | 13.17 | 2 | Adams (2010)
Shih-tzu | 13.3 | 2 | O’Neil (2013)
Schipperke | 13 | 2 | Adams (2010)
Schnauzer (standard) | 11.96 | 3 | Adams (2010)
Siberian husky | 12.58 | 3 | Adams (2010)
Skye terrier | 11 | 2 | Adams (2010)
Soft coated wheaten terrier | 12.5 | 3 | Adams (2010)
St Bernard | 7 | 5 | Adams (2010)
Staffordshire bull terrier | 10.7 | 3 | O’Neil (2013)
Staffordshire bull terrier | 12.75 | 3 | Adams (2010)
Standard poodle | 12 | 4 | Adams (2010)
Sussex spaniel | 11.13 | 3 | Adams (2010)
Swedish valhund | 14.42 | 2 | Adams (2010)
Tibetan mastiff | 11.92 | 4 | Adams (2010)
Tibetan spaniel | 14.42 | 2 | Adams (2010)
Tibetan terrier | 12.17 | 2 | Adams (2010)
Toy poodle | 14.63 | 1 | Adams (2010)
Weimaraner | 11.13 | 4 | Adams (2010)
Weimaraner | 12.6 | 4 | O’Neil (2013)
Welsh corgi | 12.21 | 2 | Adams (2010)
Welsh springer spaniel | 12.58 | 3 | Adams (2010)
Welsh terrier | 12.67 | 2 | Adams (2010)
West highland white terrier | 13 | 2 | Adams (2010)
West highland white terrier | 13.5 | 2 | O’Neil (2013)
Whippet | 12.79 | 2 | Adams (2010)
Yorkshire terrier | 12.67 | 1 | Adams (2010)
Yorkshire terrier | 13 | 1 | O’Neil (2013)

** Breed Weight Group: 1 = toy, 2 = small, 3 = medium, 4 = large, 5 = giant

Crossbred dogs have increased longevity, compared with purebreds, irrespective of bodyweight, based on predicted effects from hybrid vigour. Crossbreds demonstrated a 1.2 year average survival advantage over purebreds [4]. A valuable study of dog breeds compared purebred and crossbred longevity across five bodyweight categories, which demonstrated that age at death for purebred dogs was significantly lower than that of crossbred dogs for each bodyweight group [7]. This finding suggests that hybrid vigour substantially affects longevity in dogs. One possible explanation is that hybrid dogs are less likely to be homozygous for deleterious genes [8]. Only molecular genetic analysis of genes associated with longevity can explain this feature. Young dogs usually died from gastrointestinal and infections causes, whereas older dogs died of neurological and neoplastic causes [9]. Breed specific proportional mortalities were described as the most common causes of death in 72 breeds. The breeds with the highest proportional mortalities for cancer included, in descending order; Irish water spaniel, Flat-coated retriever, Hungarian wirehaired vizsla, Bernese mountain dog, Rottweiler, Italian spinone, Leonberger, Staffordshire bullterrier, Welsh terrier, and Giant schnauzer [3]. Breeds with a cardiac condition as the highest breed specific proportional mortality, in descending order, included Cavalier King Charles spaniel, Norfolk terrier, Deerhound,
Griffon Bruxellois, and the British bulldog [3]. In the Cane Corso Italiano breed, a relationship between longevity and hair colour was found for the first time in mammals [6]. This finding can suggest some relationship between genes associated with longevity and genes responsible for hair colour.

**Conclusion**

Understanding longevity and aging across species and individuals is critical for reaching higher ages at death in animals, as well as in humans. By understanding genetics, the age limits of animals and humans can be significantly prolonged. Detection and analysis of genes associated with longevity present a very promising method for prolongation life. In the Cane Corso Italiano dog breed a relationship between longevity and hair colour was found for the first time in mammals.

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