

Report from the Kennel Club/  
British Small Animal Veterinary Association  
Scientific Committee

Summary results of the  
Purebred Dog Health Survey  
for the Leonberger breed

Warning: The results of this survey and particularly the breed-specific analyses should be interpreted with caution. The overall response rate was only 24% with breed-specific response rates from 4.5% to 64.7%.

## The Leonberger breed

A total of 350 forms were sent out and 109 were returned, representing 223 live dogs. This breed had a 31.1% response rate (109/350) and it represented 0.79% of all returns (109/13,741).

### Mortality data

A total of 47 deaths were reported and this represents 0.30% of all deaths reported in the survey (47/15,881). The median age at death for the Leonberger breed was 7 years and 1 month (min = 5 months, max = 12 years and 8 months) and this was lower than the overall median of 11 years and 3 months (Figure 1). Table 1 shows the causes of death for the Leonberger breed. Age at death is presented for the most common causes of death (Figure 2).

Table 1. Causes of death by organ system/category for the Leonberger breed.

| Cause of death | N  | %     | Most common specific causes in descending order     |
|----------------|----|-------|---|
| 1 Cancer       | 21 | 44.7  | Unspecified; lymphoma; bone (unspec.)               |
| 2 Cardiac      | 5  | 10.6  | Heart failure; cardiomegaly; dilated cardiomyopathy |
| 3 Unknown      | 4  | 8.5   |   |
| 4 Dermatologic | 3  | 6.4   | Anal furunculosis                                   |
| 5 Neurologic   | 3  | 6.4   | Seizures; spinal cord disease; unspecified          |
| 6 Respiratory  | 3  | 6.4   | Laryngeal paralysis; tracheitis; pneumonia          |
| 7 Endocrine    | 2  | 4.3   | Addisons disease; diabetes mellitus                 |
| 8 Trauma       | 2  | 4.3   | Road traffic accident; unspecified                  |
| 9 Behaviour    | 1  | 2.1   | Aggression  |
| 10 Collapse    | 1  | 2.1   |   |
| 11 Old age     | 1  | 2.1   | Old age & age combinations                          |
| 12 Other       | 1  | 2.1   | Unspecified   |
| Total          | 47 | 100.0 |   |

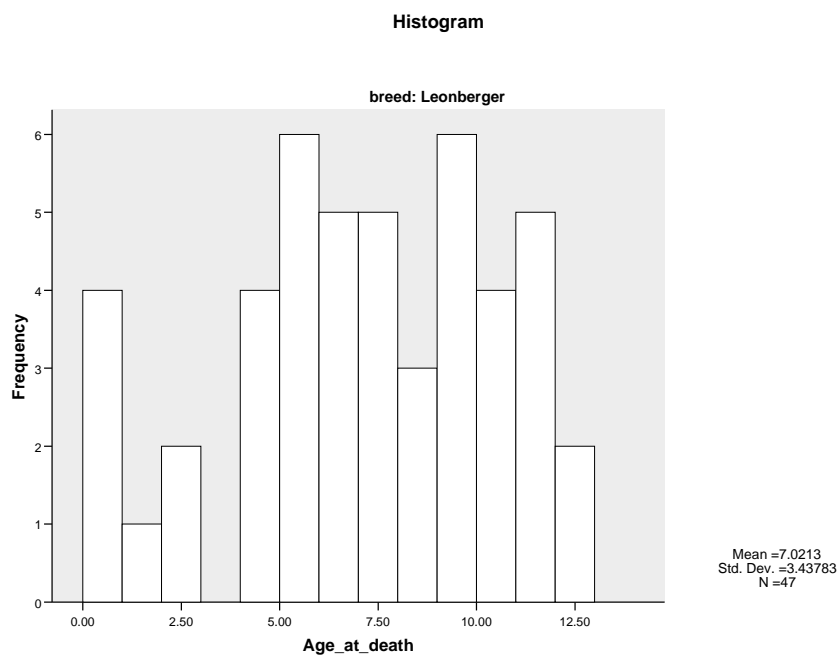


Figure 1. Histogram showing the frequency (as number of dogs) of age at death (in years) for the 47 Leonberger deaths with age at death reported.

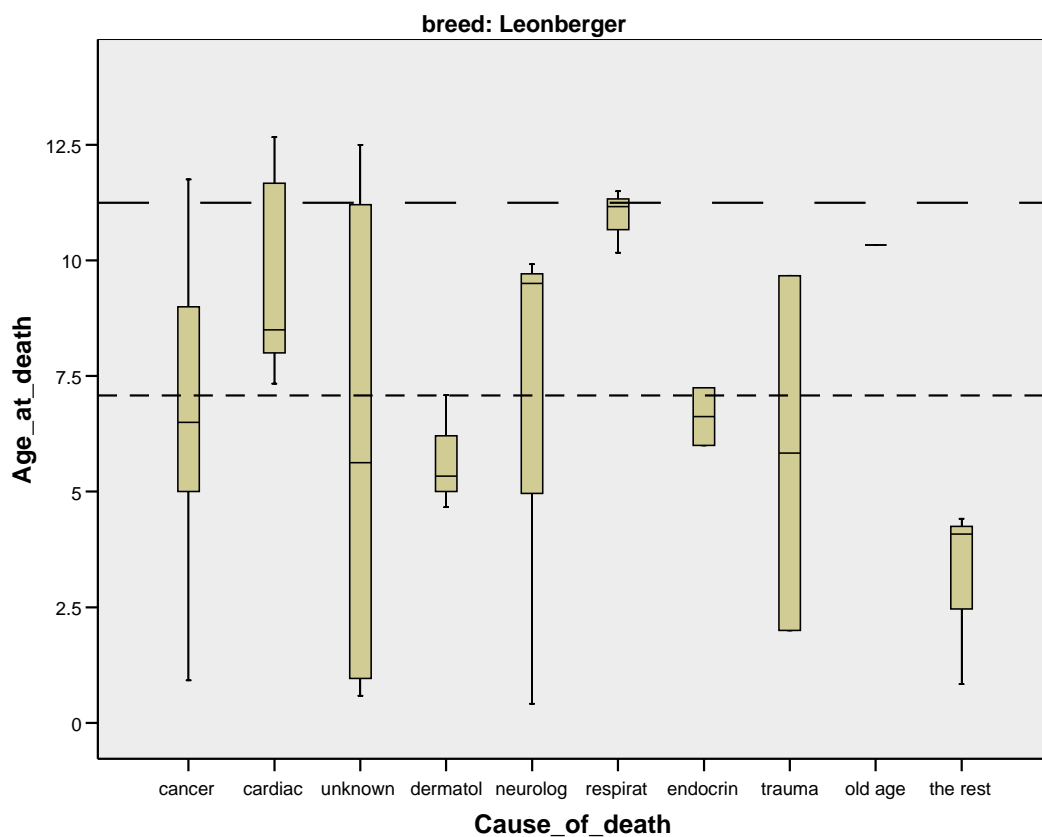


Figure 2. Box and whisker plot of age at death in years for the most common causes of death in the Leonberger breed (N=47). The dashed line (---) is the overall median age at death for all dogs in the survey and the dotted line (---) is the overall median age of death for the Leonberger breed. The solid line within each grey box represents the median age at death from the condition.

**Morbidity data**

The median current age of the 223 live dogs with a reported age was 3 years and 6 months (min=1 month, max=11 years and 8 months, Figure 3). Health information was reported for 223 live dogs of which 125 (56%) were healthy and 98 (44%) had at least one reported health condition, resulting in a total of 170 reported conditions with a median of 1 condition/dog (min=1, max=7).

The median current age of all healthy dogs with a reported age (N=125) was 2 years and 6 months (min=2 months, max=11 years). The distribution of gender and neuter status is shown in Table 2.

The median current age of all dogs with one or more disease conditions and a reported age (N=95) was 5 years and 1 month (min=1 month, max=11 years and 8 months). The median age at diagnosis for all disease occurrences with a reported age at diagnosis (N=162) was 2 years and 6 months (min= 1 month, max= 11 years and 2 months, Figure 4). Table 3 shows the disease conditions for the Leonberger breed. Age at diagnosis is presented for the most common disease conditions (Figure 5).

Table 2. Distribution of gender and neuter status for the 223 Leonberger breed with reported gender and neuter status.

| Gender | Neuter status |          | Totals     |
|--------|---------------|----------|------------|
|        | Intact        | Neutered |            |
| Female | 80            | 49       | 129 (58%)  |
| Male   | 77            | 17       | 94 (42%)   |
| Totals | 157 (70%)     | 66 (30%) | 223 (100%) |

Significantly more females were neutered (P=0.0013).

**Histogram**



Figure 3. Histogram showing frequency of current age in years for the 223 live Leonberger breed with age reported.

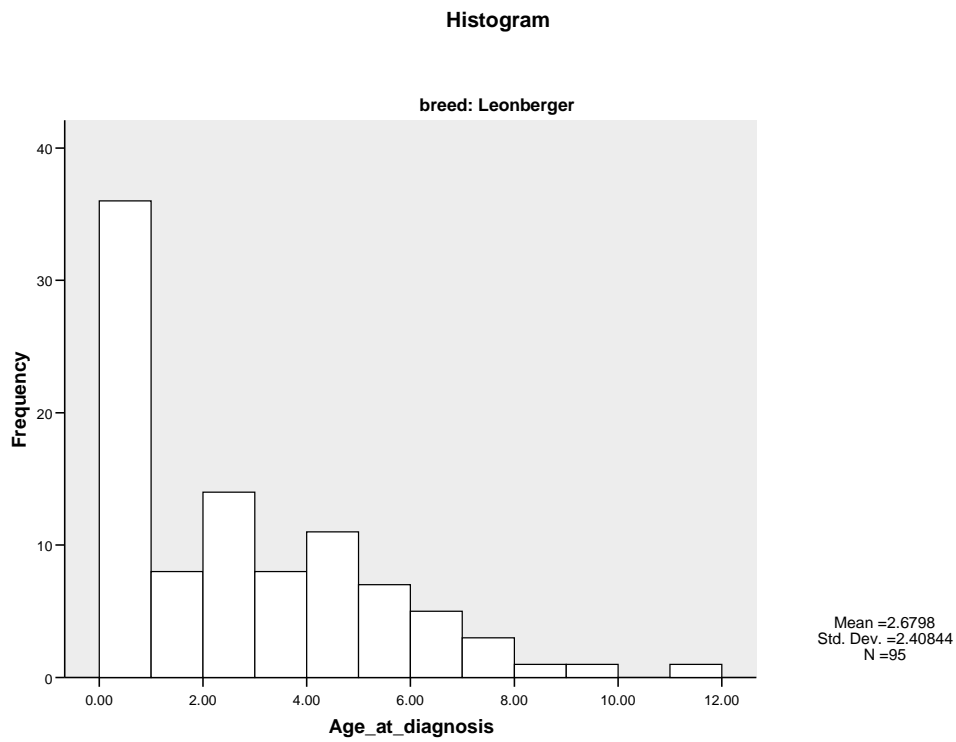


Figure 4. Histogram showing frequency of age at diagnosis for the 95 Leonberger breed with one or more disease conditions, using the youngest age at which a disease condition was first reported for those dogs with more than one disease condition or episode.

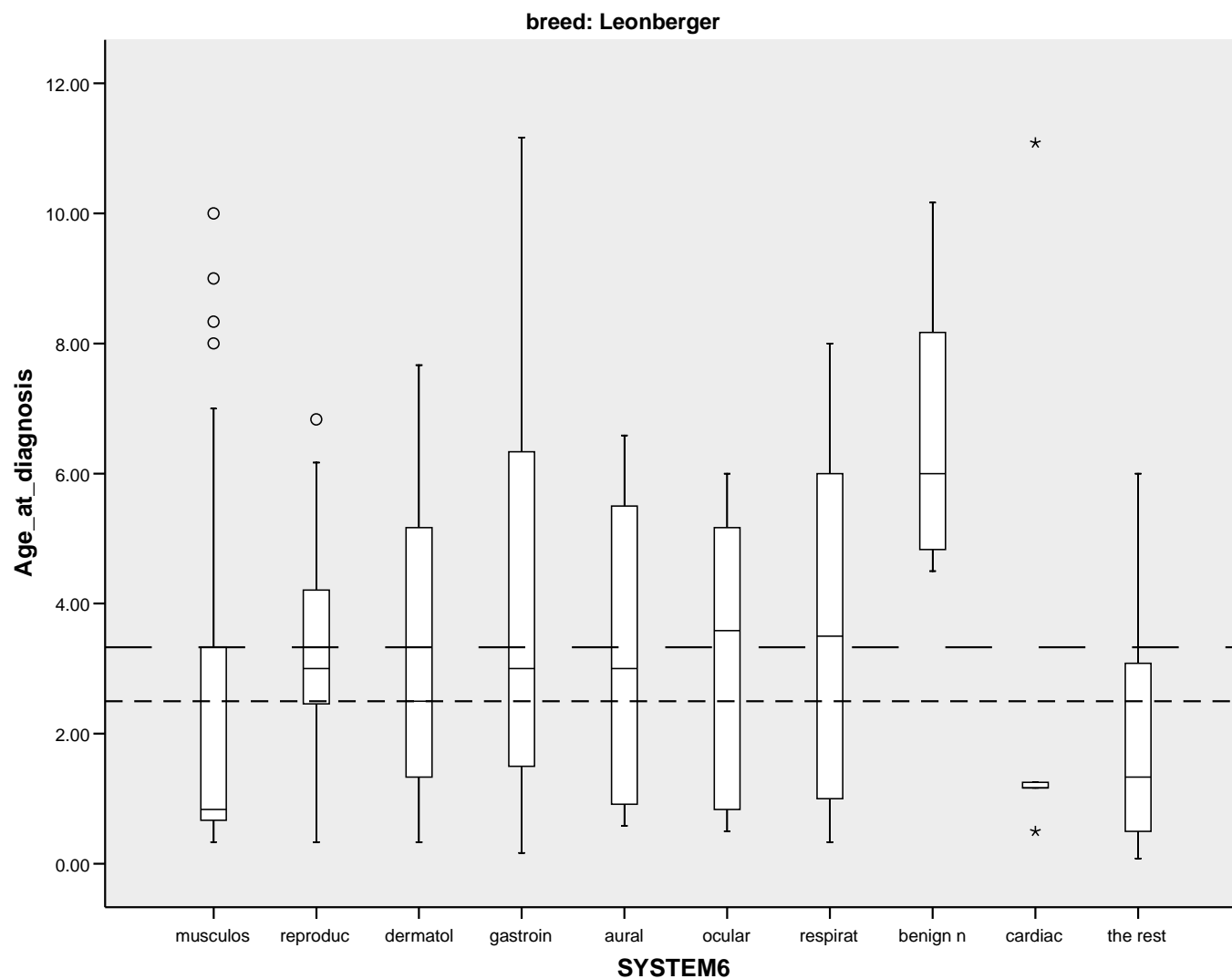


Figure 5. Box and whisker plot of age at diagnosis in years for the most common disease conditions in descending order for the Leonberger breed (N=95 dogs with 162 conditions with age reported). The dashed line (---) is the overall median age at diagnosis for all dogs in the survey and the dotted line (----) is the overall median age at diagnosis for the Leonberger breed. The solid line within each grey box represents the median age at diagnosis from the condition.

Table 3. Disease conditions by organ system/category for the Leonberger breed.

| Disease condition   | All conditions |       | Most common specific conditions in descending order   |
|---------------------|----------------|-------|---|
|                     | N              | %     |   |
| 1 Musculoskeletal   | 36             | 21.2  | Panosteitis; CLR; arthritis (carpus>rest); CHD; lameness (unspecified)                      |
| 2 Reproductive      | 20             | 11.8  | Irregular heat cycles; dystochia (uterine inertia); pyometra; infertility                   |
| 3 Dermatologic      | 19             | 11.2  | Pyotraumatic dermatitis; mites (sarcoptes>cheyletiella); dermatitis                         |
| 4 Gastrointestinal  | 15             | 8.8   | Gastric dilatation/volvulus (GDV); colitis; diarrhoea; vomiting; campylobacter; inappetance |
| 5 Aural             | 13             | 7.6   | Otitis externa; ear mites   |
| 6 Ocular            | 13             | 7.6   | Cataracts (unspecified>congenital); entropion   |
| 7 Immune mediated   | 10             | 5.9   | Gluten-sensitive enteropathy; flea allergy; food allergy; atopy; bee sting allergy          |
| 8 Respiratory       | 9              | 5.3   | Laryngeal paralysis; kennel cough; bronchitis; laryngitis                                   |
| 9 Trauma            | 8              | 4.7   | Dermatologic; ocular (eyelid; eyeball); musculoskeletal (hindlimb)                          |
| 10 Benign neoplasia | 5              | 2.9   | Lipoma  |
| 11 Cardiac          | 5              | 2.9   | Heart murmur (unspecified>grade 3); cardiomyopathy (unspecified); pulmonic stenosis         |
| 12 Dental           | 3              | 1.8   | Retained puppy teeth; extra teeth   |
| 13 Neurologic       | 3              | 1.8   | Polyneuropathy; seizures; vestibular disease  |
| 14 Unknown          | 3              | 1.8   | Undiagnosed illness   |
| 15 Endocrine        | 2              | 1.2   | Addisons disease; hypothyroidism  |
| 16 Urologic         | 2              | 1.2   | Cystitis  |
| 17 Behaviour        | 1              | 0.6   | Unspecified   |
| 18 Cancer           | 1              | 0.6   | Lymphoma (thorax)   |
| 19 Haematopoietic   | 1              | 0.6   | Platelet disorder (unspecified)   |
| 20 Hepatic          | 1              | 0.6   | Hepatitis   |
| Total               | 170            | 100.0 |   |