**ffBeaCon Open Health Registry** **Report**

**April, 2017**

Contents

[Preamble 3](#_Toc479944056)

[Notice of Copyright 3](#_Toc479944057)

[WebSite. 3](#_Toc479944058)

[Statistics for Dogs, Litters, and Pups (Data Source: AKC and KC) 4](#_Toc479944059)

[Litters By Year of Registration 4](#_Toc479944060)

[Litters and Pups By Year of Whelping 5](#_Toc479944061)

[Analysis of Litter and Pup Numbers for 2012-2016 6](#_Toc479944062)

[Genetic Diversity of US Bearded Collies 6](#_Toc479944063)

[Open Health Registry Statistics 7](#_Toc479944064)

[Number of Owners and Dogs 7](#_Toc479944065)

[Update Information 7](#_Toc479944066)

[Geographic Location 7](#_Toc479944067)

[Graph - Dog’s Country of Origin 8](#_Toc479944068)

[General Dog Information (# = 2932) 8](#_Toc479944069)

[Sex and Reproductive Status 8](#_Toc479944070)

[Living Dogs 9](#_Toc479944071)

[Health Problems 9](#_Toc479944072)

[Autoimmune (AI) Disease 9](#_Toc479944073)

[Age of Diagnosis 10](#_Toc479944074)

[Sex Distribution of AI Disease 10](#_Toc479944075)

[Behavioral, Temperament Issues 11](#_Toc479944076)

[General Categories 11](#_Toc479944077)

[Fear 11](#_Toc479944078)

[Aggression 11](#_Toc479944079)

[Endocrine Problems 12](#_Toc479944080)

[Cancer 12](#_Toc479944081)

[Immunoglobulin Mediated Disorders 13](#_Toc479944082)

[Other Diseases or Problems 13](#_Toc479944083)

[Health Screening Tests 14](#_Toc479944084)

[Reproductive Outcome 15](#_Toc479944085)

[Dogs. 15](#_Toc479944086)

[Later Health Problems in Dogs’ Progeny 16](#_Toc479944087)

[Bitches. 16](#_Toc479944088)

[Breeding Methods Resulting In Live Pups. (Unknown in 47). 16](#_Toc479944089)

[Bitches’ Progeny and Early Identifiable Issues 16](#_Toc479944090)

[Later Health Problems in Bitches’ Progeny 17](#_Toc479944091)

[Sharing of Health Information. 17](#_Toc479944092)

[Mortality 17](#_Toc479944093)

[General 17](#_Toc479944094)

[Age Group Distribution 18](#_Toc479944095)

[Leading Causes of Death 18](#_Toc479944096)

[Cancer Caused Deaths (n=283) 20](#_Toc479944097)

[Autoimmune Disease Caused Deaths (n=76) 20](#_Toc479944098)

[Coefficient of Inbreeding (COI) 21](#_Toc479944099)

[Data 21](#_Toc479944100)

[Conclusions 22](#_Toc479944101)

# Preamble

This is BeaCon’s 15th year in existence and the 15th year of reporting the health status of Bearded Collies in our Open Health Registry. Each owner and breeder who participates in the open health registry makes an important contribution to our knowledge base.

The reader is referred to the year 12 report introduction for information about participation, use of the database, and pedigree information Go to this [link](http://www.beaconforhealth.org/YR%2012%20report%20long%20version.pdf)

New breeders in particular, face the dilemma of having limited amounts of data on which to make an informed decision about what would constitute a good pairing. One can go to the various registries for information such as the OFA web site or CHIC, but it should be understood that a dog being listed in one of these registries does not automatically indicate that the dog has normal results, nor is the list of health issues comprehensive. If the dog is not listed, then a copy of the original test results should be requested. The BeaCon Open Health Registry should not be used as a definitive source for health screening test results. Readers are encouraged to contact a dog’s owner for confirmation and additional information as needed.

Our goal continues to be the inclusion of every Beardie possible, whether or not it is used in a breeding program. We therefore discourage selectively entering only certain dogs or not entering some health problems, we want all dogs and all health problems and all lines!

BeaCon encourages breeders to enroll pups in the Open Health Registry before they go to their new homes. Having a large number of healthy young dogs to follow over the long term is an optimal resource for determining frequency of diseases in any breed.

Since participation in the registry is voluntary, there are a number of large holes in the data; this means that some lines are missing. That should not be interpreted as those lines being free of health issues as compared with lines represented in the registry.

## Notice of Copyright

All information contained in this report is fully copyrighted by the Bearded Collie Foundation for Health (BeaCon).  Permission is granted to print information only for personal use or for publication in educational materials for Bearded Collie owners.  Nothing obtained from the information available herein may be published in any form, whether for profit or not, without permission of BeaCon.

Respectfully submitted, the Board of Directors for the Bearded Collie Foundation for Health (BeaCon)

Linda Aronson

Peg Caldwell

 CJ del Valle

Karen Drummond

 Judy Howard

 Sarah Ritchie

 Elsa Sell

**April 2017**

## WebSite.

[www.beaconforhealth.org](http://www.beaconforhealth.org)

# Statistics for Dogs, Litters, and Pups (Data Source: AKC and KC)

## Litters By Year of Registration

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **USA - AKC** |  | **UK - KC** |
| **# Dogs****Registered** | **# Litters****Registered** | **# Pups in****Litters** | **Av # pups/****Litter** | **#** **Registered** | **#** **Litters** | **av# pups** **per litter** |
| 2016\* | 224 | 58 | 310 | 5.3 | 284 | 51 | 5.3 |
| 2015 | 247 | 51 | 256 | 5.2 | 346 | 53 | 6.3 |
| 2014 | 289 | 68 | 383 | 5.6 | 371 | 64 | 5.6 |
| 2013 | 319 | 79 | 417 | 5.3 | 543 | 91 | 6.0 |
| 2012 | 269 | 64 | 353 | 5.5 | 463 | 78 | 5.9 |
| 2011 | 345 | 62 | 395 | 6.4 | 538 | 93 | 5.8 |
| 2010 | 321 | 93 | 498 | 5.4 | 572 | 95 | 6.0 |
| 2009 | 331 | 84 | 463 | 5.5 | 528 | 90 | 5.9 |
| 2008 | 393 | 82 | 421 | 5.1 | 643 | 113 | 5.7 |
| 2007 | 413 | 110 | 603 | 5.5 | 606 | 98 | 6.2 |
| 2006 | 447 | 90 | 537 | 5.2 | 720 | 119 | 6.1 |
| 2005 | 485 | 109 | 658 | 6.0 | 650 | 113 | 5.8 |
| 2004 | 562 | 150 | 842 | 5.6 | 821 | 129 | 6.4 |
| 2003 | 543 | 154 | 897 | 5.8 | 668 | 109 | 6.2 |
| 2002 | 587 | 159 | 943 | 5.9 | 901 | 140 | 6.4 |
| 2001 | 620 | 165 | 953 | 5.8 | 721 | 121 | 6.0 |
| 2000 | 682 | 183 | 1031 | 5.6 | 952 | 150 | 6.4 |
| 1999 | 614 | 196 | 1202 | 6.1 | 1034 | 175 | 5.9 |
| 1998 | 752 | 175 | 1077 | 6.2 | 1119 | 179 | 6.3 |
| 1997 | 711 | 197 | 1249 | 6.3 | 1286 |  |
| 1996 | 720 | 178 | 1031 | 5.8 | 1318 |
| 1995 | 762 | 186 | 1105 | 5.9 | 1467 |
| 1994 | 640 | 177 | 1057 | 6.0 | 1337 |
| 1993 | 749 | 157 | 912 | 5.8 | 1506 |
| 1992 | 766 | 182 | 1092 | 6.0 | 1575 |
| 1991 | 796 | 194 | 1162 | 6.0 | 1621 |
| 1990 | 700 | 181 | 1062 | 5.9 | 1715 |
| 1989 | 713 | 185 | 1128 | 6.1 | 1945 |
| 1988 | 817 | 190 | 1175 | 6.2 |  |
| 1987 | 760 | 184 | 1098 | 6.0 |
| 1986 | 797 | 185 | 1175 | 6.4 |
| 1985 | 858 | 191 | 1253 | 6.6 |
| 1984 | 858 | 209 | 1330 | 6.4 |
| 1983 | 895 | 201 | 1190 | 5.9 |
| 1982 | 763 | 196 | 1257 | 6.4 |
| 1981 | 723 | 172 | 1095 | 6.4 |
| 1980 | 653 | 155 | 909 | 5.9 |
| 1979 | 588 | 127 | 782 | 6.2 |
| 1978 | 472 | 111 | 684 | 6.2 |
| 1977 | 446 | 85 | 496 | 5.8 |
| 1976 | - | - | - | - |

\*2016 is incomplete

USA registration data begin with 1977 when the breed was recognized by AKC. The decline in number of USA litters and number of pups in registered litters was statistically significant when first analyzed in 2007. The decline seen in the USA (AKC data) mirrors that seen in the UK (Kennel Club data).

Registrations have been below those of 1977, the founding year, since 2011. The continued decline over the past five years should be viewed as a warning about the breed’s existence and is a subject for the parent club breeders to address in the immediate future.

## Litters and Pups By Year of Whelping

The data were also examined by year of whelping because some litter registrations are delayed until the year after whelp. The decline is similar to that of registered litters by year.

The graph below shows the number of pups by year whelped.



Statistical analyses showed a statistically significant decrease in the mean (average) number of pups/litter (ANOVA test) and the median number of pups/litter (Kruskal-Wallis test) over time (analysis by Eileen Beachell). In the graph below, the mean number of pups is given on both sides.



### Analysis of Litter and Pup Numbers for 2012-2016

A more refined analysis just for the years of 2012-2016 shows no statistically significant trend up or down, so at least the situation is stable and the decline maybe have finally bottomed out. Based on that analysis, the average number of litters in any given month is 5.4 litters. So, we would expect going forward to see 5 or 6 litters per month. The average number of pups whelped per month would be expected to be around 29 in the future based on this data. The variation from month to month would be expect to be around 13 to 44 pups for any given month.

##

Genetic Diversity of US Bearded Collies
This lay summary was written by CA Sharp of the Australian Shepherd Genetics and Health Institute.

Dr. Bell used the Bearded Collie AKC studbook pedigree data on 4911 dogs to perform a genetic diversity analysis of the breed in the US.  He used that data to determine who the UK breed founders (pedigree unknown) and earliest ancestors were, who their descendants were and what impact they have had on the breed in the United States since AKC recognition in 1977.   The founders and earliest ancestors represent the original genetic potential in the population. Breeder selection over time, both in the UK and the US, has favored lines of descent from some founders over those of others. A few founders have no living descendants and thus their contribution has been lost.

This is not necessarily a negative. The failure of those lines to persist probably arises from generations of breeders who found those descendants either had undesirable traits that they did not wish to perpetuate or those dogs were less desirable than other lines present at the time.  However, the **breed’s current decline in population size may lead to a significant loss of genetic diversity should it continue**.

The breed today has a slightly higher average coefficient of inbreeding (measure of relatedness of the sire and dam) than do other breeds. This is not unusual for small-population breeds with a relatively complete database of dogs from the founders on down and that are comparatively new to registration. Bell’s analysis indicates that **the Bearded Collie presently has sufficient genetic diversity to remain viable IF the population recovers in size** – something that requires the recruitment of new generations of breeders as well as continued effort by established breeders.

To read Dr. Bell’s complete report of the analysis, go to this [link](http://www.beaconforhealth.org/Final_Stud_Book_Analysis%20with%20edit%20restrictions.pdf)

# Open Health Registry Statistics

Data throughout the report represent all Beardies in the registry. Some dogs are in the private section of the registry (by preference or breeder reporting) and they will not appear in the public searches or reports. Data analysis was done in the week starting March 15, 2017.

## Number of Owners and Dogs

There are 884 owners with 2932 Beardies, an increase of 210 dogs. Of the total, 264 dogs are in the private sector of the open registry; their information is used in this report but will not display in on-line searches or reports.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **# Owners** | **# Dogs** | **Dogs added** | **Months Included** |
| 16 | 884 | 2932 | 210 | Mar 16 – Mar 17 |
| 15 | 848 | 2722 | 271 | Mar 15 – Mar 16 |
| 14 | 804 | 2451 | 139 | Mar 14 – Mar 15 |
| 13 | 779 | 2312 | 130 | Mar 13 – Feb 14 |
| 12 | 755 | 2182 | 129 | Mar 12 – Feb 13 |
| 11 | 729 | 2053 | 307 | Mar 11 – Feb 12 |
| 10 | 646 | 1746 | 176 | Mar 10 – Feb 11 |
| 9 | 606 | 1570 | 144 | Mar 09 – Mar 10 |
| 8 | 560 | 1426 | 223 | Mar 08 – Mar 09 |
| 7 | 491 | 1203 | 242 | Mar 07 – Mar 08 |
| 6 | 410 | 961 | 153 | Feb 06 – Feb 07 |
| 5 | 357 | 808 | 130 | Dec 05 – Jan 06 |
| 4 | 315 | 678 | 85 | Dec 04 – Nov 05 |
| 3 | 278 | 593 | 183 | Dec 02 – Nov 03 |
| 2 | 205 | 410 | 107 | Sept 01 – Nov 02 |
| 1 | 169 | 303 | - | July 00 – Aug 01 |

## Update Information

Information was updated on 836 dogs, 580 of those living.

##

## Geographic Location

These are arranged in descending order by number of owners in a country. There was minimal or no increase in owners from any location.

|  |  |  |
| --- | --- | --- |
| Country | Owners (#) | Dogs (#) |
| USA | 425 | 1041 |
| UK | 191 | 783 |
| Netherlands | 50 | 290 |
| Canada | 49 | 155 |
| Australia | 22 | 120 |
| Germany | 34 | 112 |
| France | 22 | 94 |
| Sweden | 15 | 83 |
| Czech Republic | 22 | 73 |
| Finland | 16 | 52 |
| New Zealand | 7 | 35 |
| Belgium | 7 | 26 |
| Scotland | 2 | 17 |
| Others\* | 22 | 54 |
|  |
| Total | 848 | 2722 |

\*Other owner locations include Austria, Brazil, Denmark, Hungary, Ireland, Norway, Portugal, Slovakia, South Africa, Spain.

Graph - Dog’s Country of Origin

Compared to last year, there was a 2% decrease from the USA and the others were essentially unchanged.

## General Dog Information (# = 2932)

Sex and Reproductive Status

These figures are similar to those in past years.

|  |  |  |
| --- | --- | --- |
| **Sex** | **# Dogs** |  |
| Male | 1289 |  |
|  Intact | 825 | 64% |
|  Neutered | 439 | 34.1% |
|  Unspecified |  25 |  |
|  |  |  |
| Female | 1643 |  |
|  Intact | 911 | 55.5% |
|  Spayed | 712 | 43.3% |
|  Unspecified | 19 |  |

Living Dogs

The average age of living dogs (n=1036) born after 4/1/2000 who have been updated in the past five years is 7.6 (standard deviation, 4.0). It is possible that some of the older dogs are deceased but haven’t been updated.

# Health Problems

The five major groups of health problems are

* autoimmune (# = 369 cases in 304 dogs)
* behavioral (# = 328 cases in 273 dogs)
* endocrine (# = 287 cases in 250 dogs)
* cancer (# = 219 cases in 201 dogs)
* allergy (# = 141 cases in 112 dogs).

Some diseases are included in more than one group; diabetes mellitus is in both autoimmune and endocrine groups; inflammatory bowel disease is in both allergy and autoimmune groups. Other diseases are at the end of this section.

## Autoimmune (AI) Disease

There were 388 cases of AI disease in 340 dogs. The percentage of the registry dogs with one or more AI diseases is 11.6%. The frequency of individual AI diseases was essentially unchanged, although SLO replaced Addison’s disease as the number one reported disease.

In the OHR, there were 157 hypothyroid dogs, or 5.4% of all dogs. How many are autoimmune is not known.

The OFA Bearded Collie database gave these stats for 839 dogs through December 2016 - AI thyroiditis in 0.1%, idiopathic hypothyroidism in 1.1%, 11.3% equivocal, and 86.9% normal. It is hoped that a repeat test was done on the dogs with equivocal tests and that breeders are following the BCCA CHIC thyroid panel testing guidelines to do an OFA thyroid evaluation from an approved lab each year until 5, thereafter every 2 years.

|  |  |  |
| --- | --- | --- |
| Disease | # dogs | % of all dogs |
| Symmetrical lupoid onychodystrophy (SLO) | 105 | 3.6 |
| Addison’s disease (hypoadrenocorticism) | 99 | 3.4 |
| Inflammatory bowel disease (IBD) | 35 | 1.2 |
| Autoimmune hemolytic anemia (AIHA) | 33 | 1.1 |
| Vaccination reaction | 21 | 0.7 |
| Systemic lupus erythematosus (SLE) | 21 | 0.7 |
| Immune mediated arthritis | 19 | 0.6 |
| Autoimmune-mediated thrombocytopenia (AITP) | 19 | 0.6 |
| Discoid lupus erythematosus | 9 |  |
| Pemphigus | 9 |  |
| Demodectic mange | 7 |
| Keratoconjunctivitis sicca | 5 |
| Diabetes mellitus | 5 |
| Myositis | 4 |
| Myasthenia gravis | 1 |

### Age of Diagnosis

Age of diagnosis was not given for all dogs so the number in the table below may be fewer than those in the preceding table. The diseases are arranged in order of increasing average age of onset; the N represents dogs whose age of onset were given.

|  |  |  |
| --- | --- | --- |
| Disease | Av age | # dogs  |
| SLO | 3.4 | 98 |
| Addison’s | 3.8 | 98 |
| Vaccination reaction | 3.9 | 21 |
| IBD | 4.2 | 33 |
| Immune mediated arthritis1 | 4.9 | 19 |
| AIHA | 5.8 | 33 |
| AITP | 7.0 | 17 |
| SLE | 7.5 | 17 |
| Keratoconjunctivitis sicca2 | 10.7 | 5 |

1. 7 dogs were diagnosed at age 7 or over; since the method used to diagnose the condition is unknown, it is possible that the # of cases is fewer and/or that the average age of diagnosis is earlier.
2. With such an advanced age, it is possible that aging rather than AI disease was a more important causative factor

### Sex Distribution of AI Disease

The percentage by females having the more frequent diseases in the table below is arranged by descending order of female prevalence.

|  |  |  |
| --- | --- | --- |
| Disease | # Female/# dogs with problem | % Female |
| Vaccination reaction | 18/21 | 85.7 |
| AITP | 13/19 | 68.4 |
| AIHA | 22/34 | 64.7 |
| SLE | 13/20 | 65 |
| Immune mediated arthritis | 12/19 | 63.2 |
| Addison’s | 60/98 | 61.2 |
| IBD | 17/35 | 48.6 |
| SLO | 43/105 | 41 |

## Behavioral, Temperament Issues

There were 329 temperament problems reported in 283 dogs. If you have had a Beardie fearful of loud unexpected noises or other behavioral/temperament issue, you are not alone.

General Categories

|  |  |
| --- | --- |
| Issue | #  |
| Fear | 260 |
| Aggression | 39 |
| Hyperactivity | 13 |
| Obsessive compulsive disorder | 12 |

Fear

The fear reactions of Bearded Collies reported in the open registry are predominantly to loud sounds which can’t be anticipated by the dog (other than thunder which follows the lightening precursor).

|  |  |
| --- | --- |
| Object of Fear | # (% of all dogs) |
| Loud sharp noises | 211 (7.2) |
| Other | 32 (1.1) |
| Everything | 10 |
| Stranger | 8 |

The fear of loud sounds has been recognized for some years. The cause(s) are not known though both genetics and acquired over time likely play a role.

Although an association between fear and hypothyroidism exists, it is unclear whether that signifies causation. Certainly the fear is ameliorated in some dogs when hypothyroidism is corrected by treatment. Among those who were fearful to loud sharp noises, 45 (21.6%) were also hypothyroid. As many dogs are never tested for hypothyroidism, this percentage could be higher.

Aggression

|  |  |
| --- | --- |
| Object of Aggression | # (% of total) |
| Dog | 19 (.7) |
| Family | 12 (.4) |
| Strangers | 3 |

Aggressive behavior has led to euthanasia of dogs from many breeds. Sometimes that is the only choice. It is important to rule out medical problems that could be causing the dog physical discomfort, pain, or hypothyroidism. Aggressive behavior can take many forms and families/individuals differ widely in the level of aggression they are prepared to tolerate/live with.  Beardies are often willing to test owners and if a growl gets them out of doing something they don’t want to do or gets them something they want they will likely try it again.  Because they are intelligent and easily bored it is important that they have plenty of exercise both physical and mental, and their owners make clear the behavior expected of them.   If the aggression is determined to be behavioral it is often possible to modify the behavior or manage it so that dog and owner can live in harmony.  In some cases psychoactive drugs will be helpful in ameliorating the aggression to the point where it is easier to reestablish appropriate behavior.  In most cases the dog can then be weaned off the medication.  Basket muzzles, gates etc., may also be useful during this time.  The help of a skilled trainer and/or veterinarian specializing in behavior may be invaluable.

## Endocrine Problems

There were 294 endocrine problems in 259 dogs. Hypothyroidism is by far the most common endocrine problem both in the Bearded Collie and other breeds. See the autoimmune section for comments about autoimmune hypothyroidism.

|  |  |  |
| --- | --- | --- |
| Disease | # (%) of All Dogs | Age at Diagnosis |
| **Average (yr)** | **Std Deviation (yr)** |
| Hypothyroid | 157 (5.4%) | 7.4 | 3.8 |
| Addison’s disease | 98 (3.3%) | 4.8 | 2.8 |
| Cushing’s disease | 31 (1.1%) | 10.7 | 3.2 |
| Diabetes mellitus | 5 |  |  |
| Insulinoma | 2 |  |  |

Cushing’s disease is obviously a later onset problem in the breed; only 2 were below 6 ½ years at diagnosis. There were no cases of hypo- or hyperparathyroidism.

Hypothyroidism has a wide range of ages at diagnosis (from 8 months to 15 years). While it is commonly stated that hypothyroidism is usually detected in dogs age 4-7, this is the age at which the more traditional symptoms of hypothyroidism usually become apparent; behavioral and more subtle signs appear in younger dogs.  In general, dogs up to age 7 primarily have thyroiditis past that age hypothyroidism increasingly becomes attributable to senescence of the thyroid gland. It is important to understand that hypothyroidism is present from an endocrine perspective of decreased thyroid gland function long before the clinical signs appear.  Both factors were the rationale behind the BCCA CHIC recommendation for a yearly thyroid panel until age 5 and then every two years. There were no cases of hypo- or hyperparathyroidism.

## Cancer

There were 248 cancer cases (8.5%) reported in 230 dogs.

|  |  |  |
| --- | --- | --- |
| Location | #  | Av Age of Diagnosis (yr) |
| Liver | 27 | 12.2 |
| Mammary | 23 | 11.1 |
| Spleen | 18 | 11.0 |
| Nasal | 16 | 11.0 |
| Abdominal | 14 | 11.8 |
| Hemangiosarcoma | 14 | 12.0 |
| Stomach | 11 | 11.8 |
| Bone | 10 | 11.3 |
| Testicular  | 7 |  |
| Kidney  | 6 |  |
| Other | 99 |  |

The 99 “other” cancers were in no predominant location. A list of the other cancers can be generated online by using the search or report function.

Because of the low necropsy rate and lack of biopsy, the prevalence of cancer and location remains indeterminate. For example, the liver, spleen, or cancers could be primary hemangiosarcoma with metastatic spread in which case, the latter would be the leading cancer for the breed.

## Immunoglobulin Mediated Disorders

Allergy generally and flea bite allergy specifically, are mediated by immunoglobulin E (Ig E) whereas, food sensitivity and intolerance is mediated by immunoglobulins A and M (IgA and IgM). Inflammatory bowel disease is related to food sensitivity or intolerance. This group of disorders is the fourth most common with 144 cases (4.9%) in 116 dogs.

The average of onset was young for all four disorders – between 3.1 and 4.2 years.

|  |  |  |
| --- | --- | --- |
| Disease | # (%) of All Dogs | Av age onset(yr) |
| Dietary allergy/food intolerance | 49 (1.8) | 3.9 |
| Inflammatory bowel disease | 32 (1.2) | 4.2 |
| Atopy | 31 (1.1) | 3.2 |
| Flea bite allergy | 28 (1.0) | 3.8 |

## Other Diseases or Problems

Frequency is calculated if there were 22 or more cases.

|  |  |  |
| --- | --- | --- |
| **Problem** | **# Dogs** | **% All Dogs** |
| Arthritis (note 1) | 87 | 3.0 |
| Umbilical hernia | 72 | 2.5 |
| Hip dysplasia | 72 | 2.5 |
| Urinary infection | 51 | 1.7 |
| Pyometra | 48 | 2.9\* |
| Cataract | 44 | 1.5 |
| Eye, other | 47 | 1.5 |
| Depigmentation  | 40 | 1.4 |
| Hearing loss (note 2) | 35 | 1.2 |
| Kidney failure, cause unknown (note 3) | 30 | 1.0 |
| Nail problems, other | 28 | 1.0 |
| Vestibular disease | 29 | 1.0 |
| Cryptorchid | 27 | 2.1\*\* |
|  |  |  |
| Hot spots | 20 |  |
| Teeth, overshot | 21 |
| Cognitive dysfunction | 20 |
| Monorchid (note 4) | 19 |
| Epilepsy, idiopathic (note 6) | 18 |
| Stroke (note 5) | 16 |
| Exercise induced hyperthermia | 15 |
| Neurological, other | 14 |
| Elbow dysplasia | 14 |
| Teeth, base narrow | 12 |

\*Pyometra frequency calculated by # cases/# bitches

\*\*Cryptorchid frequency calculated by # cases/# dogs

Note 1: Arthritis. Age of onset was given for 80 dogs; it was over 8 years of age in 61 (76%).

Note 2: Hearing loss. Three dogs had early onset. Two were deaf by 1 month of age; the other began to go deaf at age 5 yr 3 mo and was almost completely deaf by age 7 yr. The latter dog had two deaf littermates, so the cause was considered genetic by the owner. The cause might also have been in utero exposure to ototoxic chemicals or drugs.

Note 3: Kidney failure of unknown cause. 10 dogs had onset of disease before age 9 years (average age of onset was 5.5 yrs). 1 case was diagnosed as chronic interstitial nephritis by biopsy. 1 case was associated with SLE; a littermate also died early of kidney failure and their dam died of SLE. In three the kidney failure resolved. In three, the course of the kidney failure isn’t known. Beyond these cases, it should be remembered that kidney failure is a common finding in dogs with Addison’s disease at first presentation.

Kidney and liver failure are symptoms of leptospirosis (as is uveitis).  Antibiotic therapy should be instituted immediately in all suspected cases of leptospirosis, even if the dog was vaccinated as vaccines are unreliable at best.  It should also be realized that titers are unlikely to be positive until at least 10 days after symptoms first appear, so the dog should be titered again several weeks after onset of symptoms.

Note 4: Monorchid means that the dog only has one testicle anywhere in its body and is extremely rare, likely some dogs reported as monorchid are actually cryptorchid which means that one or both testicles have failed to settle in to the scrotum by age 12 weeks but are present elsewhere in the abdomen.  This is a relatively common condition.

Note 5: All were over the age of 10.5 years.

Note 6: There is insufficient information given in the cases of idiopathic epilepsy with respect to how the diagnosis was made. Review of the cases doesn’t provide history that would be compatible with idiopathic epilepsy in most; namely, few had persisting seizures or required anti-convulsant medication for control.

# Health Screening Tests

|  |  |  |
| --- | --- | --- |
| **Screening Test Done** | **# dogs** | **% of total dogs** |
| Hips  | 1087 | 37.0 |
| Eyes | 606 | 20.7 |
| Thyroid  | 364 | 12.4 |
| Elbows | 260 | 8.9 |
| CEA/CH | 82 | 3.0 |
| MDR1 | 38 |  |
| Prelim hips | 26 |  |
| DLA | 25 |  |
| Von Willebrand’s disease | 11 |  |
|  |  |  |
| Hips and eyes | 480 | 16.4 |
| Hips and thyroid | 252 | 8.6 |
| Hips and elbow | 252 | 8.6 |
| Hips, eyes, & thyroid | 207 | 7.1 |

Some dogs had some health screens done more than once, particularly eye exams and thyroid tests. DLA (dog leukocyte antigen) haplotype testing is a recently available screen in Europe and this test was done on 25 dogs. There was no dominant haplotype among those dogs. All MDR-1 results (n=26) were normal.

Collie Eye Anomaly/Choroidal Hypoplasia (CEA/CH) was identified in a Bearded Collie in the UK in 2012. This year the number having an exam for CEA/CH reached 82, which is 33 more than last year. All but one gave results and those were normal or clear of the mutation.

OFA Hip Statistics. Since Jan 1974 through December 2016, with 4791 exams, there were 16.8% excellent; 6.3% dysplastic. For 2011-2016 with 221 exams, there were 25.3% excellent and 1.8% dysplastic. It isn’t possible to be certain of the incidence of dysplasia because it is known that not all abnormal xrays are submitted to OFA.

OFA Thyroid Statistics. Since 1974 through December 2016, with 869 exams, there were 86.9% normal, 1.1% autoimmune thyroiditis, 0.7% idiopathic hypothyroidism, and 11.3% equivocal.

# Reproductive Outcome

## Dogs.

Reproductive history is recorded for 234 dogs and 231 were used for breeding with a total number bitches bred being 941. Only 94 (40%) had semen checked and a few provided additional information beyond “excellent” or “motility good”. Ideally a semen exam should include information about color, sperm count, sperm motility, and sperm morphology. In addition to the semen exam, the dog should have an exam of external organs and for scrotal torsion or prolapse.

|  |  |
| --- | --- |
| **Item** | **#** |
| # times a dog used at stud 1 2 3 4 5 6 7 8 9 10 or more | 7045241416957619 |
| Total # bitches bred | 941 |
| Litters produced | 822 |
| Total puppies produced | 4874 |
| Total female puppies produced | 1909 |
| Total male puppies produced | 1839 |

As would be expected, a pregnancy did not result from each breeding. The number of bitches bred and the number puppies produced was not listed for some dogs. There was again this year an increase in the number of breedings and litters and pups produced.

Of the dogs who were bred six or more times, just 46 (19%) bred 61% of the bitches; there were 19 dogs who were bred 10 or more times, which accounted for 39.7% (374/941) of bitches bred.

### Later Health Problems in Dogs’ Progeny

|  |  |
| --- | --- |
| **Health Problem** | **# dogs producing problem** |
| Cryptorchid | 29 |
| Other | 26 |
| Symmetrical lupoid onychodystrophy | 16 |
| Hypothyroid | 10 |
| Addison’s | 14 |
| Systemic lupus erythematosus | 2 |

Other problems that are not necessarily diagnosed in the very young pup: umbilical hernia 5 (produced by 2 dogs), heart anomaly type not identified 3, overshot bite 2, and 1 each – monorchid, persistent pupillary membrane, patent ductus arteriosus, immature kidney syndrome, AIHA, transitional vertebrae, low platelets, nail problems, steroid responsive meningitis, cancer and myositis.

## Bitches.

480 individual bitches have been bred 889 times; 805 litters and 5221 pups were produced. Average number of pups per litter was 6.2. Cesarean section delivery was done in 12.3% of the litters (77/627=12.3%). The percent live born (average 90%) and alive at six weeks (average 84%) is unchanged from previous years. The number of times a bitch has been bred is below.

|  |  |
| --- | --- |
| **Number of times bred** | # |
| 1 | 182 |
| 2 | 139 |
| 3 | 82 |
| 4 | 29 |
| 5 | 11 |
| 6 | 2 |

### Breeding Methods Resulting In Live Pups. (Unknown in 47).

|  |  |
| --- | --- |
| **Method** | **# Bitches** |
| Natural | 594 |
| A/I fresh | 76 |
| A/I chilled | 17 |
| A/I frozen | 18 |
| Natural and A/I fresh | 26 |
| A/I operative | 22 |

### Bitches’ Progeny and Early Identifiable Issues

Information about the number of puppies and early issue was provided for 621 litters.

|  |
| --- |
| **Male pups** |
|  | # | % of total |
|  total born | 2699 | - |
|  live born | 2353 | 87.2 |
|  live @ 6 wks | 2151 | 79.7 |
|  | % of live born |
|  cryptorchid | 118 | 5.0 |
|  mismark | 100 | 4.2 |
|  umbilical hernia | 80 | 3.4 |
|  bad bite | 19 |  |
|  poor pigment | 16 |
|  cleft palate | 3 |
| **Female pups** |
|  | # | % of total |
|  total born | 2524 | - |
|  live born | 2215 | 87.8 |
|  live @ 6 wks | 2019 | 80.0 |
|  | % of live born  |
|  mismark | 110 | 5.0 |
|  umbilical hernia | 79 | 3.6 |
|  bad bite | 19 |  |
|  poor pigment | 6 |
|  cleft palate | 4 |

The most prevalent identifiable early issues remain cryptorchid in male pups, mismarks and umbilical hernias in both sexes.

### Later Health Problems in Bitches’ Progeny

|  |  |
| --- | --- |
| **Problem** | **# Bitches** |
| Addison’s | 23 |
| Symmetrical lupoid onychodystrophy | 23 |
| Systemic lupus erythematosus | 4 |
| Hypothyroid | 14 |
| Other | 53 |

There is incomplete reporting of the number of progeny produced by some bitches. The other conditions can be studied by individual dams by doing a report online

Among the other are early, potentially congenital or heritable conditions:

* 6 heart problems (3 PDA; 1 persistent right aortic arch; 1 murmur, diagnosis unknown; 1 heart anomaly, diagnosis unknown)
* 3 exocrine pancreatic insufficiency
* 2 renal dysplasia; pyelonephritis (1 died at 3 wks, other at 21 mos) *(note: it is rare to die from pyelonephritis, so it is possible there was a more serious kidney or other issue that was not detected)*; seizures (1 diagnosed with idiopathic epilepsy); autoimmune hemolytic anemia; ulnar shortening (1 noted to be from premature closure of growth plate; the other associated with elbow deformity ? related to metabolic disorder)
* 1 each - hyperthyroid, discoid lupus, kidney failure (several died as young dogs), myositis, hip dysplasia, sudden collapse, loss of pigment, AIHA

Sharing of Health Information.

Puppy owners, breeders (defined normally as owner(s) of a litter’s dam), and stud dog owners all have a vital role sharing health information. When any party fails that responsibility it is to the detriment of future breeding programs and the breed’s long term health prospects.

# Mortality

## General

The percentage of deaths in each age group is calculated by # deaths/total deaths.

There were 1041 deaths reported (35.5% of all dogs) and the average of death was 12.2 years.

Necropsies were conducted on 50 (4.8%). Necropsies will sometimes be helpful in establishing the cause of death; if more were done there would be more identifiable causes of death.

Mode of death was natural in 123, euthanasia in 762, accidental in 28, and undocumented in 54.

## Age Group Distribution

Owners may have given month and year, or sometimes only year, for age of death. For those, an estimated exact date of death was assigned by using the first day of the month (if month and year were given) or assigning the date as 1/1/yyyy (if only year was given). In no case did the assignment of estimated exact date of death change the dog’s age group.

## Leading Causes of Death

|  |  |
| --- | --- |
|  | **Age at Death**  |
| **< 3 yr** | **3-6 yr** | **7-8 yr** | **9-11 yr** | **12-13 yr** | **>13 yr** |
| # Dogs | 25 | 69 | 66 | 173 | 266 | 493 |
| # Dogs minus accidental deaths | 21 | 59 | 62 | 169 | 264 | 492 |
|  |
| **Problem/Issue** |  |
| Cancer | - | 10 | 26 | 70 | 84 | 93 |
| Old Age | - | - | - | 6 | 39 | 207 |
| Autoimmune | 8 | 18 | 10 | 12 | 15 | 3 |
| Stroke\* | - | - | - | 3 | 16 | 31 |
| Kidney failure, unknown cause | 1 | 6 | 3 | 10 | 11 | 14 |
| Aggression | 2 | 5 | 1 | - | 1 | - |
|  |  |  |  |  |  |  |
| Other | 8 | 4 | 14 | 61 | 33 | 42 |
| Unknown | 2 | 16 | 18 | 7 | 62 | 102 |

The “other” problems are mostly single causes.

\*Old dog vestibular disease from which dogs routinely make complete recovery in 3-21 days is often mistaken for stroke (and vice versa) which may also resolve usually in a slightly longer time period; it could also be mistaken for brain tumors which obviously do not resolve but are uncommon.

Dogs under 9 years of age accounted for almost 18% of the deaths; of those dogs, 18 were accidental deaths which leaves 128 whose death was caused by a medical condition. For dogs 9 years and older there were few accidental deaths.

A comparison of the major causes of death across age groups is shown in the graph below. For the first time, this year the number of dogs used in the denominator for calculation of percent deaths by disease excluded accidental deaths.

Cancer Caused Deaths (n=283)

Autoimmune Disease Caused Deaths (n=76)

Autoimmune diseases take their toll across all age groups, except the oldest. There were other dogs with A/I diseases whose primary cause of death was a different problem.

# Coefficient of Inbreeding (COI)

COI indicates the closeness of relationship in a pedigree. A higher number means more closely related; a lower number indicates less closely related. It is usually expressed as a percentage. The concept was developed by Sewall Wright (Coefficients of inbreeding and relationship. Am Nat. 56:330-8, 1922). The basic concept is that inbreeding exists when an ancestor appears on both sire’s and dam’s side of the pedigree.

Methodology. See explanation in Year 14 report.

**BeaCon uses 10 generations** and relaxed with maximal speed for COI calculations in Breeder’s Assistant**.** When comparing COI values obtained with other software programs the calculation methodology and the number of generations need to be identical. All pedigrees in the OHR were recalculated in 2015-16 to assure that each one was done with the identical calculation rule.

**Pedigree Display of CO**I. Starting with dogs added from early 2017 on, COI are displayed for the OHR dog and the two most recent generations of ancestors.

## Data

The data for the USA 1977 foundation stock were calculated by using just one dog from each litter so as to represent unique litters. The total number of foundation stock on October 1, 1976 was 939 dogs.

The data for the USA stud book were analyzed by Dr. Jerry Bell in late 2016; the full report is available on BeaCon’s website. The OHR data by country are arranged by decreasing COI. All countries have a minimum COI of 6-14 except for the UK which is zero.

|  |  |
| --- | --- |
| **Year Report/Other** | **Coefficient of Inbreeding (10 gen)** |
| **# dogs** | **Av COI** |
| USA stud book – birth years 1960’s 1970’s 1980’s 1990’s 2000’s 2010 on | 5613961434120372399 | 14.919.823.825.725.924.2 |
| **Open Health Registry** |
| Year 16 |
|  All dogs | 2833 | 22.4 |
|  |
|  UK | 740 | 24.1 |
|  USA | 1013 | 23.1 |
|  Belgium | 26 | 22.4 |
|  Canada | 152 | 21.7 |
|  Czech Republic | 71 | 21.7 |
|  Finland | 52 | 21.6 |
|  Australia | 120 | 20.9 |
|  Germany | 107 | 20.7 |
|  Netherlands | 279 | 18.8 |

# Conclusions

There only changes from previous years is statistical analysis of the average number of pups per litter in the USA (it significantly declined) and inclusion of the AKC stud book dog’s COI values.

The predominant health issues continue to be autoimmune diseases (Addison’s and SLO leading the list), behavioral and temperament issues, endocrine disorders, immune mediated problems, and cancer. Reproductive outcome and problems in progeny are similar to that of previous years. The distribution of diseases responsible for death at certain ages continues as in previous years. Cancer deaths are more prevalent in dogs over 8 years of age. Deaths from autoimmune diseases occur across the age spectrum except for those over 13 years of age. The lack of necropsy and the large number of unknown causes of death gives uncertainty regarding causes of mortality.

The OHR needs as many Beardies as possible, living and dead, to be entered and updated regularly to increase its value as a predictor of emerging health issues, monitor existing ones, and be a useful tool for breeding healthy dogs in future generations.

BeaCon’s Directors thank everyone who has contributed to the open health registry.