

BeaCon Voluntary Open Health Registry
Year 6 General Report
February, 2007

Year	# Owners	# Dogs	Dogs added
1	169	303	-
2	205	410	107
3	278	593	183
4	315	678	85
5	357	808	130
6	410	961	153

This Year. The data are presented in more tables, with less writing so that it is easier to take in. Two new countries are represented – the Czech Republic and Finland. There were 410 owners, an increase of 53 from year 5, and 961 Beardies, an increase of 153 from last year. There is little change in the frequency of the most common health problems; fear issues and autoimmune problems continue to lead the list. The frequency of health screens is little changed. The number of pups produced was in error last year (low); this report contains the correct number. Puppy mortality is about 5% stillborn and an additional 9-10% before 6 weeks of age. Dog mortality is similar to last year.

What is an Open Registry? Open means that the information is available to the public. In other words, the information is not held confidentially and anyone who wishes access may do so subscribing to the registry on-line.

Dogs Who May Participate in the Registry. ALL BEARDED COLLIES of known parentage; deceased or living; healthy or with a health problem; from any country. The primary owner, a co-owner, or a breeder (as of spring 07) may submit information, but written consent is always required from the primary owner.

Why All Dogs Are Important.

- All dogs are essential to get a complete picture of the extent of wellness or health problems.
- To allow calculation of disease incidence. There need to be enough dogs to calculate meaningful disease frequencies – e.g., if there are 57 dogs with Addison's in 916 dogs, the frequency of Addison's is 5.9%. If the total number of dogs is 1800 dogs, the frequency is lower, 3.1%.
- To provide whole family information which breeders can use for relative-risk pedigree analysis in diseases that are autosomal recessive.
- To provide data for researchers.
- To allow prospective puppy buyers data on health of Bearded Collies enabling them to make more informed choices.

Updating. Reminders are sent each fall to owners of all living dogs in the registry as of the most recent data entry. Updating should be done yearly, even if the dog has had no changes. You can also update whenever there has been a change in your dog's health or new health screens done – at any time.

If you have entered a diagnosis which is later changed, contact beaconbb@bellsouth.net with the new information.

Participation. The following table shows the cumulative participation over the years.

Who May Submit Information

1. Owners with whom the dog lives.
2. A co-owner. The primary owner (defined as the person with whom the dog lives) must send in a signed consent.
3. A breeder. Starting in the spring of 07, a breeder may also submit information. The primary owner must send in a signed consent.
4. Breeders who enter a sire or dam into the registry can indicate if the dog has produced a disease in offspring. This policy was started in year 3 because breeders are not always able to convince their puppy buyers to participate in the open registry. It is vital to know about certain health conditions in offspring. Specific diseases of interest are Addison's, symmetrical lupoid onychodystrophy, systemic lupus erythematosus, and hypothyroidism. Any disease can be noted in the "other" category; e.g., autoimmune hemolytic anemia or thrombocytopenia, or polyarthritis, or a heart condition. Dams producing a disease can have the number of cases and the litter (s) indicated. Sires producing a disease may have the number of cases indicated. The name of a dog with the specific disease produced cannot be listed.
5. A dog's information is not publicly available if entered by a co-owner or a breeder until the primary owner's consent is received.

Submission of Information. This may done either by hard copy form or on-line at www.beaconforhealth.org/sqlweb.

Documentation. No changes have been made from previous years. Copies of health screening test results are requested. This is especially important for dogs from countries other than the USA. We attempt to validate the information for USA dogs through the on-line registry databases (OFA or CERF). When that is not possible, it is so noted in the dog's report.

Health screening tests that have not been submitted to another registry can be included in the registry. Preferably, a copy of the documentation form is sent to BeaCon; e.g., a copy of the CERF ophthalmologists' exam for an eye exam.

Definition of Years

- Year 1. July 2000 – Aug 2001
- Year 2. Sept 2001 – Nov 2002
- Year 3. Dec 2002 – Nov 2003
- Year 4. Dec 2004 – Nov 2004
- Year 5. Dec 2005 – Jan 2006
- Year 6. Feb 2006 – Feb 2007

Pedigrees and Coefficient of Inbreeding (COI). Every effort is made to be accurate. Data for pedigrees come from many sources including pedigrees submitted by owners, the Kennel Club Breed System Bearded Collie database updates, and various online databases. With the advent of the on-line registry system, fewer pedigrees were submitted; thus the dependence on other sources. Pedigrees are generated with Breeder's Assistant, starting in Year 5. If an error is found in a pedigree, readers should notify E. Sell (beaconbb@bellsouth.net) with the correct information.

A COI is the mathematical definition that elucidates closeness of relationship in a pedigree. It is usually expressed as a percentage and it was developed by Sewall Wright (Coefficients of inbreeding and relationship. Am Nat. 56:330-8, 1922). Basic principles are that inbreeding only exists if the ancestor appears on both sire's and dam's side of the pedigree. If inbreeding is calculated to a certain dog then that to his sire and dam is ignored unless they also appear through other lines. Lines already counted once must not be counted twice.

This sounds complex. It is if you want to hand calculate COI's for more than a few generations. Willis' books (references) and various online sources describe how to do this. It isn't complex if one uses a pedigree software program with the built in calculation.

Use of Data and Caveats. Viewers of the open health registry data are responsible for interpretation and use of the information. The purpose of this registry is to give objective data on disease and wellness, not to draw conclusions about any particular line, sire, or dam.

We caution the reader that a sire or dam can not be assumed to be a carrier of an undesirable genetic trait simply because that health problem is reported in a single progeny. Furthermore, some genetic diseases may be influenced by environmental factors, not yet defined.

Geneticists believe the following circumstances are indicative of heritability:

- Relatively frequent occurrence of the disease
- When mating a sire and dam several times results in the same health problem in more than one litter.
- When a dog or bitch mated with different mates results in the same health problem in several litters.

If several dogs from the same kennel are reported with the same problem, you cannot assume that the problem occurs with high frequency. You have to know the status of the other dogs from that kennel before making any assessment regarding prevalence. This means that full participation by a breeder is important, rather than selectively entering just healthy dogs in the registry.

Many hereditary problems, other than those transmitted by an autosomal dominant mode of inheritance, involve healthy parents, one or both of whom are carriers of the genes responsible.

Information that a particular dog or bitch has produced a problem is vital to any breeder. This is especially critical for novice breeders just establishing their programs because they are least likely to have a good network for finding and verifying such information.

BeaCon encourages breeders to enroll pups in BeaCon's 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 to determining frequency of diseases in any breed.

The inclusion of dogs in this registry is by the free choice of the owner/co-owner. Absence of dogs from this registry is also by the free choice of the owner/co-owner. Notice of the registry's availability is made through resources available to BeaCon: BeaCon's newsletter (Lighting the Way) and web site (www.beaconforhealth.org), and Bearded Collie internet lists.

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

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Cumulative Report for Year 6

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Demographic Data for Complete Open Health Registry

Item	#	
Owners	410	
Australia	11	
Belgium	1	
Brazil	1	
Canada	28	
Czech Republic	2	
Denmark	1	
Finland	6	
England	52	
France	1	
Germany	19	
New Zealand	3	
Northern Ireland	1	
Portugal	1	
Scotland	2	
South Africa	3	
Spain	1	
Sweden	1	
USA	275	
Not indicated	1	
Dogs	961	
Location		% of total dogs
USA	559	58%
UK, Scotland	192	20%
Canada	56	5.9%
Germany	45	4.7%
Australia	37	3.4%
Sex - male	418	43.5% of all dogs
intact	211	50.5% of male dogs
neutered	194	46.4% of male dogs
unknown	13	
Sex - female	543	56.6% of all dogs
intact	252	46% of female dogs
spayed	280	51.9% of female dogs
unknown	11	
Dogs with no health problems	458	47.7% of all dogs

Owners from two new countries participated this year, the Czech Republic (2 owners; 8 dogs) and Finland (6 owners; 22). How is it that so many came in from just two locations? The answer is interest in and enthusiastic leadership for the registry program.

Health Problems. As last year, fewer than 50% of the dogs are reported as healthy. We report frequency of specific health problems if there are more than 20 cases of the problem. A caveat of both the healthy dog and disease frequency figure is that they apply to this specific population of Bearded Collies. It is unknown if the findings are applicable to the broad population of Beardies.

Health Problem	# of Dogs	% of All Dogs
Fear, loud sharp noises	147	15.3%
Autoimmune diseases (see table below)	123	12.8%
Hypothyroidism*	79	8.2%
Umbilical hernia	57	5.9%
Cancer (all types)**	57	5.9%
Hip dysplasia	39	4.1%
Fear, other	26	2.7%
Atopy	25	2.6%
Allergy, flea bite	24	2.5%
Dietary allergy/food intolerance	24	2.5%
Depigmentation***	22	2.3%
Nail problems other than lupoid onychodystrophy	19	
Inflammatory bowel disease	18	
Vaccination reaction	13	
Hot spots	10	
Hyperactivity	9	
Kidney failure	8	
Exercise induced collapse or hyperthermia	5	
Demodectic mange	4	
Exocrine pancreatic insufficiency	4	
Keratoconjunctivitis	3	
Diabetes mellitus	2	

* The incidence of autoimmune thyroiditis in Bearded Collies appears to be low based on information from OFA labs - 2.0% of 244 tested.

** Cancer diagnoses were:
nasal in 8
liver in 7
mammary 4
bone 4
spleen 3 (plus 1 of liver and spleen)
hemangiosarcoma 3

The reader is referred to the online OHR search facility for a look at the less common cancers (“other”).

*** Note: some cases of depigmentation can be autoimmune in nature (e.g., vitiligo, or associated with lupus or pemphigus). Since there are other causes of depigmentation, it was not placed into the table with autoimmune diseases.

Autoimmune Problems (# diseases = 146; # dogs having diseases = 123, or 12.8% of all dogs). Although the frequencies appear to be unduly high in this population of Bearded Collies (i.e., in the open health registry), it is not known if the figures are applicable to the general population of Bearded Collies world wide. That will remain unknown until a much larger number of dogs are in the open registry.

Disease	#	% of All Dogs	#(%) with > one A/I disease
Addison's disease (hypoadrenocorticism)	57	5.9%	6 (10.5%)
Symmetrical lupoid onychodystrophy (SLO)	20	2.2%	4 (20%)
Inflammatory bowel disease (IBD)	18	1.9%	3 (16.7%)
Systemic lupus erythematosus (SLE)	13	1.4%	4 (30.8%)
Autoimmune hemolytic anemia (AIHA)	12	1.3%	3 (25%)
Rheumatoid arthritis*	11	1.1%	5 (45.5%)
Pemphigus	6		3 (50%)
Idiopathic thrombocytopenia (ITP)	5		3 (60%)
Discoid lupus erythematosus	3		1 (33%)
Myositis	1		1 (100%)

* These include cases of suspected immune polyarthritis

13 dogs had more than one disease:

- 10 dogs had 2 A/I diseases
- 1 dog had 3 A/I diseases
- 2 dogs had 4 A/I diseases

Addisonian dogs

- 12 are hypothyroid
- 20 have fear of loud sharp sounds

Health Screening Tests

Screening Test Done	#	% of All Dogs
Hips	394	41%
Eyes	265	28%
Thyroid	209	22%
Elbows	82	8.5%
Hips and eyes	222	23%
Hips and elbows	80	8.3%
Hips and thyroid	139	14.5%
Hips, eyes, and thyroid	131	13.6%
Hips, eyes, elbows, and thyroid	27	2.8%

The frequency of individual health screening tests and the various combinations were essentially unchanged from the previous year.

Reproductive Outcome

Dogs. There were 84 with reproductive history recorded; only 38 had semen checked and 78 were bred. The following table shows the number of bitches bred and the number of litters produced.

Item	#	Av	Range
Bitches bred	78	3.7	1-19
Litters produced	76	3.4	0-18

Problems developing in the progeny were:

Health Problem	# dogs producing problem	# progeny with problem
Addison's	6	13*
Symmetrical lupoid onychodystrophy	4	5
Systemic lupus erythematosus	1	1
Hypothyroid	5	6
Other	8	1 – nail problem 4 – heart problems

* one dog produced 5 progeny with Addison's

Females. 153 of the 169 females were successfully bred and they produced 336 litters. Cesarean section delivery was done in 28 (8.3% of all litters), which is up from 6.5% last year. The average number of litters was 2.1.

The breeding methods were:

Natural	221 (66%)
A/I fresh	31 (9%)
A/I chilled	18 (5.4%; no change from last year)
A/I frozen	7 (2.1%)
A/I operative	10 (3.0%)
Not recorded	49

The number of progeny born and congenital problems are given in the table below (note: the figures for last year were calculated incorrectly and were low).

Male pups		
	#	% of total
total born	929	-
live born	879	94.6
live @ 6 wks	795	85.6
% of live at 6 weeks		
cryptorchid	44	5.5
mismark	38	4.8
umbilical hernia	22	2.8
bad bite	9	
poor pigment	9	
cleft palate	3	

Female pups		
	#	% of total
total born	851	-
live born	808	95
live @ 6 wks	737	86.6
		% of live at 6 weeks
mismatch	41	5.6%
umbilical hernia	34	4.6%
bad bite	5	
poor pigment	4	
cleft palate	2	

Specific later health problems in the progeny of bitches are shown in the next table.

Health Problem	# bitches producing problem	# progeny with problem
Addison's	10	16*
Symmetrical lupoid onychodystrophy	6	8
Systemic lupus erythematosus	2	2
Hypothyroid	7	8
Other	16	22**

* One bitch produced 6 Addisonian puppies

** Among the problems were 5 puppies with heart problems (3 PDA; 1 persistent right aortic arch); 1 each produced hyperthyroid, discoid lupus, autoimmune hemolytic anemia, pyelonephritis (early death at 3 wks), kidney failure (several died as young dogs).

Mortality. There are 211 (22%) dogs deceased. There may be others also deceased but their owners have not responded to update requests. Autopsies were conducted on 16 (7.6%) deceased dogs. Owners should remember that autopsies will sometimes be helpful in establishing the cause of death. If more autopsies were done in those where death is not due to very old age and related maladies, there would certainly be more identifiable causes of death.

Causes of death in different age groups are given below. The number with cause of death is fewer than the number of deceased because age of death couldn't be calculated in all dogs.

The leading causes of death before 9 years of age were autoimmune (n=8, 22.9%) and accidental (n=6, 17%). The final report of the BCCA 96-98 health survey found 30% of deaths before age 9 were due to autoimmune causes. Such a high frequency of autoimmune problems causing premature death is of concern. The question is whether causes of these autoimmune diseases can be identified and then addressed effectively.

Cancer is the leading cause of death for 9-14 year olds and old age takes over thereafter.

Age Group	# Deaths	Causes of Death
0 – 2 yr 11 mo	6	2 accidental 1 each intussusception, aggression, pemphigus & SLO, and IBD
3 yr – 6 yr 11 mo	18	4 unknown 2 accidental 1 each SLE, cancer other, cancer small intestine, acute renal failure, chronic interstitial nephritis, respiratory failure, ITP, acute fulminating pancreatitis after whelping, aggression secondary to SLO episodes, liver failure, difficulty managing visual problem, suspected warfarin poisoning
7 yr – 8 yr 11 mo	11	2 unknown 2 accidental 1 each AIHA, vascular invasive abdominal mass, infection secondary to immune mediated polyarthritis, sudden onset of complete hind leg paralysis, small intestinal cancer, kidney failure secondary to Addison's, aggression toward family member
9 yr – 13 yr 11 mo	77	25 cancer 9 cardiac (1 was heart attack; others heart failure) 6 old age 5 unknown 3 each, stroke & kidney failure 2 accidental 24 single diagnoses
14 yr and older	43	21 old age (some with severe arthritis, or kidney or heart failure or cognitive dysfunction) 6 cancer remainder assorted individual causes or unknown

Coefficient of Inbreeding (COI). The COI values were calculated using the Breeder's Assistant (BA) Pedigree Software for eight generations of ancestors.

Further information about COI's and their meaning can be found on the internet and also on BeaCon's web site in the section on open health registry data.

Year of Report	Coefficient of Inbreeding				
	Av	SD	min	max	# dogs
6	24.0	5.7	0	42.8	800
7 – all dogs	23.9	5.8	0	42.8	951
7 – USA	23.9	5.8	11.2	42.8	557
7 – UK, Scotland	25.0	6.9	0	40.5	185
7 – Canada	23.7	4.7	13.1	33	56
7 – Germany	20.4	6.0	10.8	38.4	45